



SENATE

NOTICE OF MEETING

May 10, 2024

Please be advised that the next regular meeting of Senate of Concordia University will be held on Friday, May 17, 2024, at 2 p.m., in the Norman D. Hébert, LLD Meeting Room (Room EV 2.260) on the SGW Campus.

The Agenda and documents for the Open Session meeting are now posted on the [Senate webpage](#).

Please note that Closed Session documents and discussions are confidential.

Members of the University community who wish to view the Open Session meeting are invited to go to EV 2.301. You will be admitted to the observers' gallery following the Closed Session meeting.

Karan Singh
Secretary of Senate



AGENDA OF THE OPEN SESSION OF THE MEETING OF SENATE

Friday, May 17, 2024
immediately following the Closed Session meeting
in the Norman D. Hébert, LLD Meeting Room
(Room EV 2.260) on the SGW Campus
and via Zoom Videoconferencing

Item	Presenter(s)	Action
1. Call to order	G. Carr	
1.1 Approval of the Agenda	G. Carr	Approval
1.2 Adoption of Minutes from the Open Session meeting of March 22, 2024	G. Carr	Approval
CONSENT AGENDA		
2. Tribunal Pool/Committee Appointments (Document US-2024-3-D4)		Approval
3. Committee reports (Document US-2024-3-D5)		Information
4. Revisions to the Policy on Establishment of Tribunal Pools (BD-6) (Document US-2024-3-D6)		Approval
5. Revision of Senate Standing Committee membership and mandate (Document US-2024-3-D7)		Approval

REGULAR AGENDA

- | | | | |
|-----|---|---|-------------|
| 6. | Business arising from the Minutes not included on the Agenda | | |
| 7. | President's remarks | G. Carr | Information |
| 8. | Academic update (Document US-2024-3-D8) | A. Whitelaw | Information |
| 9. | APC recommendation - new program:
Bachelor of Engineering - Cybersecurity Engineering (GCS-CIISE-5564)
(Document US-2024-3-D9) | A. Whitelaw/
M. Debbabi | Approval |
| 10. | APC recommendation - new program:
Bachelor of Science - Cybersecurity (GCS-CIISE 5566) (Document US-2024-3-D10) | A. Whitelaw/
M. Debbabi | Approval |
| 11. | APC recommendation - new program:
Graduate Diploma - Teacher Certification (AS-EDUC-5510) (Document US-2024-3-D11) | A. Whitelaw/
P. Sicotte/
S. Carliner | Approval |
| 12. | APC recommendation - new program:
Graduate Certificate - Curatorial Studies and Practices (FA-ARTH-5506)
(Document US-2024-3-D12) | A. Whitelaw/
A. Gérin/
E. C. Paterson | Approval |
| 13. | APC recommendation - new program:
Graduate Microprogram - Curatorial Studies (FA-ARTH-5507) (Document US-2024-3-D12) | A. Whitelaw/
A. Gérin/
E. C. Paterson | Approval |
| 14. | Report on academic programs | G. Carr/
A. Whitelaw | Information |
| 15. | Concordia's Strategic Directions at 50 | G. Carr | |
| 16. | Question period (<i>maximum 15 minutes</i>) | | |
| 17. | Other business | | |
| 18. | Adjournment | G. Carr | |



US-2024-2

**MINUTES OF THE OPEN SESSION
OF THE MEETING OF SENATE**

Friday, March 22, 2024,
immediately following the Closed Session
in the Loyola Chapel (Room FC-110), Loyola Campus
and via Zoom video conferencing

PRESENT

Voting members:

Anne Whitelaw (Chair)	Selvadurai Dayanandan	Raghulkanna Lakshmanan
Angelica Antonakopoulos	Mourad Debbabi	Christopher Moore (zoom)
Leslie Barker	Larry Deck	David Morris
Dominique Bérubé	Effrosyni Diamantoudi	Catherine Mulligan (zoom)
Beverley Best (zoom)	Mehdi Farashahi (zoom)	Xavier Ottenwaelder
Theresa Bianco	Ariela Freedman	Véronique Pepin
Amy Buckland (zoom)	Annie Gérin	Mahshid Rahbari (zoom)
Alexandrah Cardona	Marina Ghali (zoom)	Rosemary Reilly
Sally Cooke (zoom)	Bonnie Harnden	Pascale Sicotte
Anne-Marie Croteau	Steve Henle	Craig Townsend
Fabienne Cyrius (zoom)	Arnav Ishaan (zoom)	Roberto Viereck-Salinas
Alexandra Dawson (zoom)	Charles Rohinth Joseph	Radu Grigore Zmeureanu
Niraj Dayanandan	Mehdi Kharazmi (zoom)	

Non-voting members: Philippe Beauregard, Paul Chesser, Stéphanie de Celles, Nadia Hardy, Stefana Nita (zoom), Carlos Santana, Melodie Sullivan (zoom - attended on behalf of Frederica Jacobs), Olivia Ward (zoom)

Also attending: Caroline Baril, Rachel Berger, Sandra Betton, Richard Courtemanche, Sandra Gabriele, Andrea Jakob (zoom), Tom Peacock (zoom), Rahul Ravi (zoom)

ABSENT

Voting members:

Matthew Barker	Michael Lecchino	Zachary Patterson
Graham Carr	Harley Martin	Ian Rakita

Roy Cross
Dany-Ariel Ishimwe
Moshe Lander

Robert Padmore
Mireille Paquet
Deep Patel

Ahmed Soliman
Melissa Spiridigliozzi
Sofiène Tahar

Non-voting members: Denis Cossette, Michael Di Grappa, Isabel Dunnigan

1. Call to order

The Chair called the meeting to order at 2:12 p.m.

1.1 Approval of the Agenda

R-2024-2-4 Upon motion duly moved and seconded, it was unanimously resolved that the Agenda of the Open Session be approved.

1.2 Adoption of February 8, 2024, Minutes

R-2024-2-5 Upon motion duly moved and seconded, it was unanimously resolved that the Minutes of the Open Session meeting of February 8, 2024, be adopted.

CONSENT

- **Tribunal Pool/Committee Appointments** (Document US-2024-2-D2)

R-2024-2-6 Upon motion duly moved and seconded, it was unanimously resolved that the Tribunal Pool and Committee appointments be approved.

- **Committee reports** (Document US-2024-2-D3)

These reports were provided for information purposes only.

REGULAR

- **Business arising from the Minutes not included on the Agenda**

There was no business arising from the Minutes not included on the Agenda.

President's remarks

- The Chair delivered remarks on the President's behalf.
- Following a very successful Open House, enrolment rates have been positive overall. Even after the tuition news, the numbers at Open House were higher than expected, with a 9% increase in attendees from the previous year. The attendees included prospective students from 46 different countries.

- University recruiting teams continue to work to engage with prospective students. The number of applications had been trending downwards; however, the decline hasn't been as bad as was anticipated. There has been a decline seen in applicants from the Rest of Canada and international students, but there has been a slight increase in applications from Quebec. Overall, the biggest decline has been in professional programs, which stands at 44%. The confirmations will be the best measure of final figures, however at this time, a decline of 5.1% overall is being projected. The Chair thanked the faculties, departments, and staff for the continued work on recruitment.
- The Quebec government has presented its budget, with a modest overall increase for the entire university sector, at 1.6%. Until full details are provided in the *Règles budgétaires*, which will be released by the government at the end of April, the expectation is that there will not be any increase in funding with a modest increase in tuition.
- The Chair spoke briefly on the budget situation and noted that the university was on its way to achieving the 7.8% budget reduction required to meet the \$35M deficit target for 2023-24. More effort will be needed to achieve the government-approved deficit for 2024-25. More information will be communicated in the coming months.
- On the legal challenge against the Quebec government's decision to increase tuition for Rest of Canada and international students, the behind-the-scenes work is ongoing. The University team is waiting for confirmation on when the matter will be taken up by the court, however, there doesn't seem to have been any impact on interactions with the Quebec government and it is business as usual.
- Some good news: the Stinger's Women's ice hockey team won the national title, defeating the Toronto Varsity Blues in the championship game. Year after year the ice hockey team is also one of the most performing academically.
- Undergraduate student Selma Herrero Lepers won two prizes at the 2024 *Délie ta langue!* public-speaking competition. Concordia was the only anglophone university participating in the Université de Montréal-organized event and Herrero Lepers was the only contestant to take home two prizes. This proud accomplishment demonstrates Concordia's continued commitment to francization.
- Concordia also won the top prize at the 18th edition of the *Jeux de la traduction*, hosted at Université Laval. The winning team was comprised of six students, a coach, and Professor Danièle Marcoux.
- The University will also be welcoming two Banting fellows as post-doctoral students. The information remains under embargo, but this is an excellent development. The Chair congratulated the School of Graduate Studies for their work on this initiative.

- The Chair informed Senate of a recent on-campus incident. On March 13th, there were protests that led to a disturbance outside of the Hillel Concordia office that was intended to intimidate. Campus safety and the SPVM successfully intervened. The Chair read a statement that denounced the acts of intimidation and clearly stated the University's position on zero tolerance for intimidation on campus. The University is updating its procedures to ensure that all members of the Concordia community are safe on campus.
- On the issue of cancellation of bookings for certain events, the Chair clarified the process. Following receipt of a request for a booking, the request is reviewed for compliance to University policies. If, after approval, some information comes to light that the proposed event is contrary to University's policies, the event may be cancelled.
- The Chair concluded by reminding Senators that they can ask any questions that they may have during the question period at the end of the meeting.

2. **Academic update** (Document US-2024-2-D4)

In addition to the comments delivered under the Chair's remarks and the report included in the documentation package, there were no further updates.

3. **Approval of Executive MBA program (JMSB-EMBA-5394)** (Document US-2024-2-D5)

Dean Croteau presented the item and summarized the changes in the program, which was specifically the additional trip for students to visit indigenous communities to learn business practises. The program fees increase has already been approved by the Finance Committee of the Board.

R-2024-2-7 Upon motion duly moved and seconded, it was unanimously approved that, on recommendation of the Academic Programs Committee, Senate approve the implementation of the changes to the Executive MBA, as detailed in the attached documentation.

4. **New Program: Microprogram in Applied Artificial Intelligence** (GCS-COMP-5493) (Document US-2024-2-D6)

Dean Debbabi presented the item and provided details on the gaps the program is looking to address. This would also position the University in this emerging area. The initiative for the program came from a collaboration with training offered to Ericsson.

There have been other requests to provide training in relation to AI, and, as such, the program is timely and will fill training gaps in this area.

At the outset the program is going to be offered to students within Engineering and Computer Science, with the goal to expand it to all other disciplines, where students wish to register in this program. The program is designed as highly experiential.

Senators had questions related to the role of the Graduate Program Director and admission requirements for non-engineering students. Dean Debbabi provided clarification in relation to these questions.

R-2024-2-8 Upon motion duly moved and seconded, it was unanimously approved that, on recommendation of the Academic Programs Committee, Senate approve the Microprogram in Applied Artificial Intelligence, as detailed in the attached documentation.

5. New Program: Microprogram in Sustainability (SGS-SGS-5492)
(Document US-2024-2-D7)

Dean Diamantoudi presented the item. The proposed program is an innovative format as a graduate micro credential, which will be taught with collaboration from all four faculties. This format will allow for the use of expertise in substantiality across the University. Dean Diamantoudi expressed gratitude for the support that has been received from all faculties.

There was a question related to the Program Director and the scope of the work they would need to undertake, given that coordination for all four faculties. Dean Diamantoudi confirmed that, based on the HR policies, this was the position level that was determined at this time.

R-2024-2-9 Upon motion duly moved and seconded, it was unanimously approved that, on recommendation of the Academic Programs Committee, Senate approve the Microprogram in Sustainability, as detailed in the attached documentation.

6. Question period

During question period, a Senator spoke of the harassment of Jewish student groups and the general sense among Jewish community members of not feeling safe on campus. They asked for an update on the progress that has been made with the task force against hate.

The Chair spoke to the University's commitment to ensure that everyone feels safe on campus. There are meetings with student groups and all levels of the University on an ongoing basis, to ensure that activities, events are evaluated on a constant basis. Deputy Provost Nadia Hardy spoke to the progress made in relation to the task force against hate. Various preparatory meetings are already underway, and the structure of the task force is being established, including the identification of the Co-chairs. The sub-committees of the task force will each have a mandate, and the University community will be invited to partake in the various sub-committees' work.

The presentation of new programs earlier in the meeting prompted a question from a Senator about the success of new programs. Senate often approves new program proposals;

would it be possible to report to Senate on the success of the new programs once they have been implemented? The Chair confirmed that a report would be brought back to Senate with data on program evaluation, following approval of new programs.

7. Other business

There was no other business to bring before the Open Session.

8. Adjournment

The meeting was adjourned at 3:35 p.m.

K. Singh
Karan Singh
Secretary of Senate



**SENATE
OPEN SESSION
Meeting of May 17, 2024**

AGENDA ITEM: Committee / Tribunal Pool Appointments

ACTION REQUIRED: For approval

SUMMARY: Senate is being asked to approve the following Committee and Tribunal Pool appointments:

<u>Committee</u>	<u>Appointee</u>	<u>Term</u>
Academic Programs	William Lynch (GCS)	2024-27
Distinguished Professor Emeriti & Distinguished Librarian Emeriti	Calvin Kalman (FAS)	2024-27
	Daniel Salée (FAS)	2024-27
Steering	Theresa Bianco (FAS)	2024-25
	Patrice Blais (CUPFA)	2024-25
	Ariela Freedman (FAS)	2024-25

<u>Appointments requiring Senate ratification</u>	<u>Appointee</u>	<u>Term</u>
Faculty Tribunal Pool	Patricia Comeau (GCS)	2024-26
	Asma Fattoum-Guedri (SGS)	2024-26
	Mojtaba Kahrizi (GCS)	2024-26
	M. Zahangir Kabir (GCS)	2024-26
	Moshe Lander (FAS)	2024-26
	Jonathan Liscouët (SGS)	2024-26
	Xavier Ottenwaelder (SGS)	2024-26
	Tiberiu Popa (GCS)	2024-26
	Nathalie Rothschild (FAS)	2024-26
	Andrea Schiffauerova (GCS)	2024-26
	Marlene Sokolon (SGS)	2024-26

DRAFT MOTION:

That the Committee and Tribunal Pool appointments be approved.

PREPARED BY:

Name: Secretary of Senate

Date: May 10, 2024



**ACADEMIC PROGRAMS COMMITTEE
REPORT OF APPROVED DOSSIERS
Sandra Gabriele, PhD
April 29, 2024**

The Academic Programs Committee has approved the following changes for the Undergraduate and Graduate Calendars.

Following approval of the Faculty Councils, APC members reviewed the undergraduate and graduate curriculum submissions listed below. As a result of discussions, APC resolved that the curriculum proposals listed below be finally approved. The report of approved dossiers is provided to the Senate for information purposes.

All curriculum change dossiers listed below are available for consultation online in the [APC Approved Dossiers](#) SharePoint folder.

Undergraduate Curriculum Proposals (Changes for the 2025-26 Calendar)

Gina Cody School of Engineering and Computer Science

Department of Mechanical, Industrial & Aerospace Engineering
GCS-MIAE-5520; **APC-2024-2-D3**

- Program Requirements

John Molson School of Business

Department of Marketing
JMSB-MARK-5531; **APC-2024-3-D4**

- Program Requirements

Department of Finance
JMSB-FINA-5526; **APC-2024-3-D5**

- Courses

Graduate Curriculum Proposals (Changes for the 2024-25 Calendar)

Faculty of Arts and Science

Department of Biology
AS-BIOL-5538; **APC-2024-3-D6** (For September 2024 Implementation)

- Courses

Department of Education

AS-EDUC-5503; **APC-2024-2-D5** (For September 2024 Implementation)

- Program Requirements
- Courses

AS-EDUC-5463; **APC-2024-2-D6** (For September 2024 Implementation)

- Program Requirements
- Courses

AS-EDUC-5473; **APC-2024-2-D7** (For September 2024 Implementation)

- Program Requirements
- Regulation
- Courses

Department of English

AS-ENGL-5523; **APC-2024-2-D8** (For September 2024 Implementation)

- Courses

Department of Geography, Planning and Environment

AS-GEOG-5464; **APC-2024-3-D7** (For September 2024 Implementation)

- Program Requirements
- Courses

Department of Religions and Cultures

AS-RELI-5522; **APC-2024-3-D8** (For September 2024 Implementation)

- Program Requirements
- Regulations
- Courses

School of Graduate Studies

Individualized Program (INDI)

SGS-INDI-5536; **APC-2024-3-D9** (For September 2024 Implementation)

- Program Requirements
- Course Changes



Sandra Gabriele, PhD

Vice-Provost, Innovation in Teaching and Learning

April 29, 2024

**LIBRARY COMMITTEE
REPORT TO SENATE
Amy Buckland
Submitted for May 17, 2024**

Meeting of April 15, 2024

Sandra Margolian, the Public Art Lead presented an overview of her former and new role and responsibilities in developing Concordia's public art dossier. She walked the Senate through the [Public Art Website](#) to show concrete examples of the various governance, outreach, and conservation initiatives she has developed since 2020 and briefly touched on the history of the collection and the next steps.

Upcoming projects include the formation of committees and a five-year strategy. The presentation ended with SM inviting members to [sign up to the mailing list](#) and [CUpublicart](#) IG account.

Pat Riva reviewed the changes the Library is making to the display of current journal issues in the Webster Library. In fall 2023 the Library did a comprehensive assessment of all journal subscriptions to ensure the journals were being received in the most relevant and cost effective format, preferring online access to print in many cases. This reduces the number of print journals that will continue to be received in the Webster Library and resulted in the re-evaluation of the display of current issues. Starting in May 2024, the current issues that will be on the display stands will be those that are visually attractive for browsing and frequently published, so that the display stands change regularly. The recent issues of other journals received in print will be shelved directly in the journal stacks.

Amy Buckland talked briefly about the future themes for the Library: A.I., Data services, Special Collections & Archives and Open Scholarship.

LIBRARY
REPORT TO SENATE
Amy Buckland
Submitted for May 17, 2024

Concordia University Press looks forward to exhibiting this June at the Congress of the Humanities and Social Sciences at McGill. By the time Congress opens the Press will have published two new books, *Not All Fun and Games: Videogame Labour, Project-Based Workplaces, and the New Citizenship at Work*, by Marie-Josée Legault and Johanna Weststar, and *Family and Justice in the Archives: Historical Perspectives on Intimacy and the Law*, edited by Peter Gossage and Lisa Moore. Three more books will appear this fall, *Tracings: Writing Art, 1975–2020* by Ian Carr-Harris, *Living Design: The Writings of Clara Porset*, edited by Zoe Ryan and Valentina Sarmineto Cruz, and *Concordia University at Fifty*, edited by Monika Kin Gagnon and Brandon Webb.

As well, this summer and fall, Concordia University Press will host Mehrnoosh Alborzi, an Elspeth McConnell Fine Arts Award Recipient. The award funds Concordia Fine Arts undergraduates to gain on-the-job experience in the non-profit culture sector. Mehrnoosh will be exploring issues and best practices around e-book accessibility.

Finally, the Press's founding director, Geoffrey Little, will be leaving the Press and the University over the summer to become Vice-Provost and Chief Librarian at Western University. He departs with sincere thanks and best wishes.

The Public Art Lead and the President's Task Force on Anti-Black Racism [announce artist Charles Campbell BFA 92](#), who was chosen by jury to inaugurate the public art program [Honouring Black Presence at Concordia University](#). The University will unveil Campbell's site-specific artwork in the Hall Building in Spring 2025 and be on view for three years. The program represents one of the 88 recommendations set by the Task Force in the [Final Report of the President's Task Force on Anti-Black Racism](#).

Adam Mbowe, masters student in Cinematic Arts, will start on May 13 as the third [Black History Archives Student Resident](#) in **Special Collections**. During this eight-week residency, she will explore the [Jazz and Improvised Music archives](#) preserved in [Special Collections](#) and conduct original, primary source research into the rich history and cultural heritage of jazz and improvised music in Montreal.

The Library congratulates librarians who are moving on to bigger challenges

Geoffrey Little, AUL Scholarly Communications, has accepted the position of Vice-Provost and Chief Librarian at Western University, beginning July 22nd, 2024.

Danielle Dennie, Head of Vanier Library, has been appointed as University Librarian at Laurentian University, beginning July 1st, 2024



SENATE
OPEN SESSION
Meeting of May 17, 2024

AGENDA ITEM: Revisions to the *Policy on the Establishment of Tribunal Hearing Pools* ([BD-6](#)) (the "Policy")

ACTION REQUIRED: For approval

SUMMARY: Senate is being asked to consider and approve amendments to the Policy.

BACKGROUND: The Tribunal Hearing Pools (the "**Pools**") are established to support first level and appeal hearings at the University under various policies. The proposed changes to the Policy are to clarify the eligibility requirements for students to be nominated to the Pools.

It is also recommended that the term of office for members in Faculty Tribunal Pools and the Administrative and Support Staff Tribunal Pool be modified from the current 2-year to a 3-year period.

Finally, it is recommended that the term of Chairs for tribunal panels be modified from the current 2-year to a 3-year period.

Senate Steering recommended the approval of the modifications at its meeting of May 7, 2024. Following approval by Senate, the Board of Governors will be asked to approve the revisions to the Policy.

DRAFT MOTION:

That, upon recommendation of the Steering Committee, Senate approve of the revisions to the *Policy on the Establishment of Tribunal Hearing Pools* (BD-6), as per the attached document.

PREPARED BY:

Name: Secretary of Senate
Date: May 8, 2024

POLICY ON THE ESTABLISHMENT OF TRIBUNAL HEARING POOLS

Effective Date: [insert date]

Approval Authority: Board of Governors

Supersedes /Amends: December 15, 2022

Policy Number: BD-6

SCOPE

This policy applies to Tribunal Hearing Pools (as defined below) for hearings, both first-level hearings as well as appeal hearings at Concordia University (the “University”), provided for in the *Code of Rights and Responsibilities* ([BD-3](#)), the *Academic Code of Conduct*, the *Academic Re-evaluation Procedures*, the *Graduate Academic Appeals Procedures* and any other codes or policies which may be adopted that refer to the Tribunal Hearing Pools provided for under this Policy.

PURPOSE

The Purpose of this Policy is to provide for the establishment of pools of members to serve on various first level and appeal hearings at the University.

DEFINITIONS

“Administrative and Support Staff Tribunal Pool” or “AaSSTP” means the pool set up under [section 9](#).

“Chair(s)” means the chair(s) of a tribunal panel(s) appointed under [section 13](#).

“Faculty Tribunal Pool” or “FTP” means the pool set up under [section 6](#).

“Student Tribunal Pool” or “STP” means the pool set up under [section 2](#).

“Tribunal Hearing Pools” mean the Administrative and Support Staff Tribunal Pool, the Faculty Tribunal Pool and the Student Tribunal Pool.

POLICY

1. In the event that a hearing or appeal panel cannot be convened from the membership of the Tribunal Hearing Pools or the pool of Chairs, as outlined below, the Secretary-General shall designate the membership of the relevant hearing or appeal panel for a given case.

POLICY ON THE ESTABLISHMENT OF TRIBUNAL HEARING POOLS

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Student Tribunal Pool

2. In June of each year, the Concordia Student Union shall be asked to nominate up to a maximum of 25 undergraduate students and the Graduate Student Association shall be asked to nominate up to a maximum of 15 graduate students to form the Student Tribunal Pool.
3. In order to be eligible, undergraduate students shall have successfully completed, in the previous academic year, a minimum of nine (9) credits in an undergraduate program and graduate students shall be registered in a graduate program. . Students who are in failed standing, in conditional standing or on academic probation, or who have been sanctioned under the *Code of Rights and Responsibilities* ([BD-3](#)) or the [Academic Code of Conduct](#) within the 3 years previous to their nomination are not eligible.
4. The status and standing of student nominees shall be confirmed by the University Registrar in September prior to the submission of the list of nominees for approval to University Senate (“Senate”) by the Secretary of the Senate. In addition, the status and standing of members of the STP shall be confirmed by the University Registrar each September for as long as the member remains in office.
5. The term of office of members of the STP shall be for 2 years, from September 1 to August 31, and shall be renewable, provided that they meet the conditions at [section 4](#). Members remain in office until replaced.

Faculty Tribunal Pool

6. The Council of the Faculty of Arts and Science shall nominate 14 faculty members, the Council of the John Molson School of Business shall nominate 7 faculty members, the Council of the Gina Cody School of Engineering and Computer Science shall nominate 6 faculty members, the Council of the Faculty of Fine Arts shall nominate 3 faculty members and the Council of the School of Graduate Studies shall nominate 5 faculty members, for a total of 35 faculty members to comprise the Faculty Tribunal Pool.
7. The term of office of members of the FTP shall be for 3 years, from September 1 to August 31, and shall be renewable. Members remain in office until replaced.

POLICY ON THE ESTABLISHMENT OF TRIBUNAL HEARING POOLS

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8. The Secretary of each Faculty Council and the Council of the School of Graduate Studies shall forward a list of nominees to the Secretary of the Senate prior to its September meeting for approval.

Administrative and Support Staff Tribunal Pool

9. The AaSSTP shall be comprised of 5 members nominated in accordance with the *Policy Relating to the Administrative and Support Staff Electoral College* ([BD-12](#)).
10. Administrative and support staff members from the Office of the Secretary-General and the General Counsel, the Office of Student Tribunals, the Ombuds Office, the Student Advocacy Office and the Office of Rights and Responsibilities shall not be eligible for membership on the AaSSTP.
11. The term of office of members of the AaSSTP shall be for 3 years, from September 1 to August 31, and shall be renewable. Members remain in office until replaced.
12. The Department of Human Resources shall forward a list of nominees to the Secretary of the Board of Governors (“Board”) prior to its September meeting for approval.

Chairs

13. In addition to the members of the STP and FTP appointed by the Senate, and the members of the AaSSTP appointed by the Board, the Senate shall appoint as many individuals as necessary to serve as non-voting Chairs of the various tribunal panels dealt with under this Policy.
14. The role of the Chairs shall be to preside over the various tribunal panels, keep order and ensure fairness. The Chairs shall, as well, preside over the deliberations of the various tribunal panels but shall not vote.
15. Because the role of the Chairs of the various tribunal panels requires impartiality and particular skills which take time to develop and cannot easily be acquired by lay persons during a brief term of office, the Chairs shall normally be selected from qualified individuals who have training in law or tribunal procedures as well as some knowledge of the University environment.

POLICY ON THE ESTABLISHMENT OF TRIBUNAL HEARING POOLS

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16. The term of office for the Chairs shall be for 3 years, from September 1 to August 31, and shall be renewable.
17. The candidates for the Chairs shall be recommended to the Senate by the General Counsel, in consultation with the secretaries of the tribunal panels dealt with under this Policy. Curriculum vitae of the candidates shall accompany the recommendation.

Training

18. All members of the STP, FTP and AaSSTP, and all Chairs shall receive training prepared and conducted jointly by the secretaries of the tribunal panels dealt with under this Policy, under the supervision of the General Counsel. Training shall include principles of fairness and natural justice, and hearing of complaints of sexual violence in full awareness of their highly sensitive nature.

Policy Responsibility and Review

19. The overall responsibility for implementing and recommending amendments to this Policy shall rest with the Secretary-General.

Approved by the Board of Governors on September 18, 2003; and amended on May 20, 2004, September 18, 2008, December 16, 2021, December 15, 2022 and [insert date].

POLICY ON THE ESTABLISHMENT OF TRIBUNAL HEARING POOLS

Effective Date: ~~December 15, 2022~~[\[insert date\]](#)

Approval Authority: Board of Governors

Supersedes /Amends: December ~~16, 2021~~[15, 2022](#)

Policy Number: BD-6

SCOPE

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“Tribunal Hearing Pools” mean the Administrative and Support Staff Tribunal Pool, the Faculty Tribunal Pool and the Student Tribunal Pool.

POLICY

1. In the event that a hearing or appeal panel cannot be convened from the membership of the Tribunal Hearing Pools or the pool of Chairs, as outlined below, the Secretary-General shall designate the membership of the relevant hearing or appeal panel for a given case.

POLICY ON THE ESTABLISHMENT OF TRIBUNAL HEARING POOLS

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Student Tribunal Pool

2. In June of each year, the Concordia Student Union shall be asked to nominate up to a maximum of 25 undergraduate students and the Graduate Student Association shall be asked to nominate up to a maximum of 15 graduate students to form the Student Tribunal Pool.
3. In order to be eligible, undergraduate students shall have successfully completed, in the previous academic year, a minimum of nine (9) credits in an undergraduate program and graduate students shall be registered in ~~an undergraduate or a~~ graduate program ~~and be in good standing~~. Students who are in failed standing, in conditional standing or on academic probation, or who have been sanctioned under the *Code of Rights and Responsibilities* (BD-3) or the *Academic Code of Conduct* within the 3 years previous to their nomination are not eligible.
4. The status and standing of student nominees shall be confirmed by the University Registrar in September prior to the submission of the list of nominees for approval to University Senate ("Senate") by the Secretary of the Senate. In addition, the status and standing of members of the STP shall be confirmed by the University Registrar each September for as long as the member remains in office.
5. The term of office of members of the STP shall be for 2 years, from September 1 to August 31, and shall be renewable, provided that they meet the conditions at [section 4](#). Members remain in office until replaced.

Faculty Tribunal Pool

6. The Council of the Faculty of Arts and Science shall nominate 14 faculty members, the Council of the John Molson School of Business shall nominate 7 faculty members, the Council of the Gina Cody School of Engineering and Computer Science shall nominate 6 faculty members, the Council of the Faculty of Fine Arts shall nominate 3 faculty members and the Council of the School of Graduate Studies shall nominate 5 faculty members, for a total of 35 faculty members to comprise the Faculty Tribunal Pool.
7. The term of office of members of the FTP shall be for ~~2~~3 years, from September 1 to August 31, and shall be renewable. Members remain in office until replaced.

POLICY ON THE ESTABLISHMENT OF TRIBUNAL HEARING POOLS

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8. The Secretary of each Faculty Council and the Council of the School of Graduate Studies shall forward a list of nominees to the Secretary of the Senate prior to its September meeting for approval.

Administrative and Support Staff Tribunal Pool

9. The AaSSTP shall be comprised of 5 members nominated in accordance with the *Policy Relating to the Administrative and Support Staff Electoral College* ([BD-12](#)).
10. Administrative and support staff members from the Office of the Secretary-General and the General Counsel, the Office of Student Tribunals, the Ombuds Office, the Student Advocacy Office and the Office of Rights and Responsibilities shall not be eligible for membership on the AaSSTP.
11. The term of office of members of the AaSSTP shall be for ~~2~~³ years, from September 1 to August 31, and shall be renewable. Members remain in office until replaced.
12. The Department of Human Resources shall forward a list of nominees to the Secretary of the Board of Governors (“Board”) prior to its September meeting for approval.

Chairs

13. In addition to the members of the STP and FTP appointed by the Senate, and the members of the AaSSTP appointed by the Board, the Senate shall appoint as many individuals as necessary to serve as non-voting Chairs of the various tribunal panels dealt with under this Policy.
14. The role of the Chairs shall be to preside over the various tribunal panels, keep order and ensure fairness. The Chairs shall, as well, preside over the deliberations of the various tribunal panels but shall not vote.
15. Because the role of the Chairs of the various tribunal panels requires impartiality and particular skills which take time to develop and cannot easily be acquired by lay persons during a brief term of office, the Chairs shall normally be selected from qualified

POLICY ON THE ESTABLISHMENT OF TRIBUNAL HEARING POOLS

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individuals who have training in law or tribunal procedures as well as some knowledge of the University environment.

16. The term of office for the Chairs shall be for ~~2~~3 years, from September 1 to August 31, and shall be renewable.
17. The candidates for the Chairs shall be recommended to the Senate by the General Counsel, in consultation with the secretaries of the tribunal panels dealt with under this Policy. Curriculum vitae of the candidates shall accompany the recommendation.

Training

18. All members of the STP, FTP and AaSSTP, and all Chairs shall receive training prepared and conducted jointly by the secretaries of the tribunal panels dealt with under this Policy, under the supervision of the General Counsel. Training shall include principles of fairness and natural justice, and hearing of complaints of sexual violence in full awareness of their highly sensitive nature.

Policy Responsibility and Review

19. The overall responsibility for implementing and recommending amendments to this Policy shall rest with the Secretary-General.

Approved by the Board of Governors on September 18, 2003; and amended on May 20, 2004, September 18, 2008, December 16, 2021, ~~and~~ December 15, 2022, and [insert date].



SENATE
OPEN SESSION
Meeting of May 17, 2024

AGENDA ITEM: Revisions to the membership of the Senate Research Committee (SRC)

ACTION REQUIRED: For approval

SUMMARY: Senate is being asked to consider and approve modifications to the membership of the SRC.

BACKGROUND: The Library, its services, collections, expertise, and spaces directly impacts, and is impacted by, the University's research mandate and activities. The proposed membership of a representative from Library on the SRC will ensure that the Library is positioned to support the growing research enterprise at the University. The expertise in digital scholarship, data management, scholarly communication, open science, funding agency requirements, grants, etc., would benefit, and benefit from, the participation of a representative from Library on the SRC.

As the Library refreshes its vision for the future, its participation on SRC will ensure that the Library continues to offer researchers the support they need to have genuine impact at the local and global levels.

The SRC recommended this expansion of its membership and the inclusion of the Librarian as a voting member of the SRC, at its meeting of April 29, 2024, which was then approved by Senate Steering at its meeting of May 7, 2024.

DRAFT MOTION:

That, upon recommendation of the Senate Research Committee and Senate Steering, Senate approve the modifications to the membership of the Senate Research Committee, as detailed in the attached document.

PREPARED BY:

Name: Secretary of Senate

Date: May 8, 2024

MEMBERSHIP AND FUNCTIONS OF SENATE STANDING COMMITTEES

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 5. Ethics Committee
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 7. Research Committee
 8. Special Graduation Awards Committee
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Nature and Role of Senate Standing Committees

The Senate standing committee structure has as its objective to facilitate debate on the floor of Senate itself and to make that debate as pertinent, concise, and efficient as possible while ensuring that the responsibilities of Senate are fully carried out. Standing committee reports allow Senators to familiarize themselves as completely as possible with the matters to be discussed and to satisfy themselves that necessary questions have been asked and that answers have been obtained. A functioning standing committee structure of this nature supposes that in those cases where, on the floor of Senate, there is a feeling that questions remain unanswered, the matter should be referred back to the appropriate standing committee for the work to be carried out to the satisfaction of Senators.

The Senate standing committees will from time to time need technical and administrative expertise in the matters under study and this service will be provided for Senate and its standing committees by an appropriate sector of the University Administration. The appropriate Vice-President is responsible for ensuring that technical and administrative expertise is available where necessary.

Circulation of Documentation

Every effort shall be made to ensure that all documentation for consideration by Senate standing committees shall reach the members of the standing committee in sufficient time to permit due consideration prior to the meeting. Under normal circumstances, the agenda and supporting documents shall be circulated no later than one week prior to the meeting.

Senate Standing Committees

The standing committee structure is as follows:

1. Steering Committee
2. Academic Planning and Priorities Committee (APPC)
3. Academic Programs Committee (APC)
4. Distinguished Professor Emeriti and Distinguished Librarian Emeriti Committee
5. Ethics Committee
6. Library Committee
7. Research Committee
8. Special Graduation Awards Committee

The voting and quorum-determination status of the Provost and Vice-President, Academic, and the Vice-President, Research and Graduate Studies vary according to their roles and direct report representation on each standing committee and is outlined below.

- Non-voting members of Senate standing committees shall not be counted in the determination of quorum.
- *Committee members marked with an asterisk are voting members who are not included for the purposes of determining quorum.
- All standing committee positions filled by nomination shall be ratified by Senate.
- The eligibility requirements under Article 64 of the Concordia University By-Laws shall apply to the members of the standing committees of Senate.

7. Research Committee

7.1 Membership:

- The Provost and Vice-President, Academic *;
 - The Vice-President, Research and Graduate Studies - Chair;
 - The University Librarian (or delegate);
 - The Associate Deans responsible for research from each Faculty;
 - The Dean Graduate Studies (or delegate);
 - The Dean, School of Health (or delegate);
 - Four faculty members, one each from the Faculty of Arts and Science, the Faculty of Fine Arts, Gina Cody School of Engineering and Computer Science, and the John Molson School of Business;
 - Two faculty Senators;
 - One undergraduate student;
 - Two graduate students, normally from different Faculties;
 - The Associate Vice-Presidents, Research (non-voting);
 - The Director, VPRGS sector (non-voting).
-

Faculty member representatives on the Research Committee shall be nominated by their respective Faculty Councils. Faculty member appointments are for a three-year term. Faculty Senators shall be nominated by Steering Committee from among the faculty Senators. Faculty Senators appointments are for a one-year term. Student representatives shall be nominated by their respective student associations, which are encouraged to designate their nominees from among Senators. Student appointments are for a one-year term.

The Research Committee is empowered to nominate, on an annual basis, up to two additional tenured or tenure-track faculty members as members-at-large to give a balanced representation to important research areas.

7.2 **Mandate:**

- Identify current research issues and propose ways and means of responding to these challenges;
- Study and make recommendations to Senate concerning:
 - o the development of research in the University, and internal resources to support research;
 - o the creation and/or revision of all research-related policies under the Office of the Vice-President, Research and Graduate Studies;
- the revision of institutional and government-mandated plans related to research; Undertake any other function that may be delegated to it by Senate; and
- Make any other recommendations to Senate that it judges appropriate within the scope of its mandate.

as approved by the Board of Governors on September 6, 1973; and revised by the Board of Governors on March 20, 1986 (effective July 1, 1986) and June 15, 2023;

and as amended by Senate on September 26, 1986; December 19, 1986; May 8, 1987; May 29, 1987; December 18, 1987; January 22, 1988; May 6, 1988; September 13, 1991; December 4, 1992; October 28, 1994; September 15, 1995; September 13, 1996; February 7, 1997; March 7, 1997; June 9, 2000; January 18, 2002; December 8, 2006; February 12, 2010 (effective June 1, 2010); May 21, 2010 (effective June 1, 2010), April 15, 2011; February 17, 2012; September 14, 2012, April 17, 2015 (effective June 1, 2015), December 9, 2016, March 16, 2018, December 11, 2019; September 21, 2021; May 20, 2022; May 19, 2023.



Internal Memorandum

To: Members of Senate
From: Anne Whitelaw, Provost and Vice-President, Academic
Date: May 8, 2024
Re: Academic Update

In the latest [EdUniversal Best Masters Ranking](#), [John Molson School of Business](#) ranked among the top in North America for its MSc programs. The MBA and EMBA continue to move up in these rankings as well.

The John Molson MBA team placed 2nd at [IBECC: The International Business Ethics Case Competition](#) in the 10-minute presentation category for “Building Trust in the US healthcare system: Fostering a new relationship between HealthCare and the Black community in the United States”. Their solution focused on Community Health Hubs, improved Access, Representation and Education.

The [Département d'études françaises](#) finished first at the [18th edition of the Jeux de la traduction](#), held at Université Laval from March 15 to 17.

Four undergraduate students were awarded the [Lieutenant Governor's Youth Medal](#). Hannah McGregor-Pelletier (BA, Joint Specialization in English and History, Minor in Education), Rudyard Pejo (BA, Major in Human Relations, Minor in Psychology), Catherine Starr-Prénovost (BA, Psychology) and Jessica Winton (BA, Urban Planning) were honoured for their volunteerism, academic achievement, and commitment to their communities.

Three graduate students took home top prizes after competing live at the annual [Three Minute Thesis competition](#) (3MT®). Angelika Gnanapragasam (MA, Health and Exercise Science), Emma Hsiaowen Chen (PhD, Health and Exercise Science) and Monali Patel (MASc, Chemical Engineering) distilled their research down to 180 seconds at the annual event.

The [School of Graduate Studies](#) announced the [winning photos from Concordia's 2024 Science Captured competition](#). Ameer Nizami (PhD, Chemical Engineering), Allison Peacock (PhD, Humanities), Farhan Rahman Chowdhury (PhD, Biology), Matthew Regan (MA, Biology) were recognized for depicting their research through a vibrant image.

[Katie-May Arndt](#), a PhD candidate in the [Interdisciplinary Humanities](#) program (HUMA), is the recipient of the 2024 [William Blair Bruce European Fine Art Travel](#) Scholarship. The annual prize for a promising graduate student in visual arts includes a travel stipend for a research-creation experience in Europe. For her residency, Arndt will study the rich tradition of folk tapestry weaving in Sweden, called Flamskväv.

The 3rd annual [Miywâcimo! storytelling competition](#) highlighted Indigenous student research. Ellen Dobrowolski, a PhD candidate in the [Department of Religions and Cultures](#), won the first prize.

Selma Herrero Lepers, a student in [Political Science](#) and [Economics](#), took home 2 prizes at the [2024 Délie ta langue!](#) public-speaking competition. Concordia is the only English-language institution to participate in the Université de Montréal–organized event.

[Kuh Del Rosario](#), an MFA graduate of the [Department of Studio Arts](#), and Lynn Kodeih, a graduate of visual and media arts at Université de Québec à Montréal (UQAM), were the 2024 recipients of the [Claudine and Stephen Bronfman Fellowship in Contemporary Art](#). Both receiving \$60,000 over two years, the fellowship is the most generous post-MFA awards for emerging artists in Canada and is awarded to two students enrolled in a master's or PhD program in the media arts or visual arts programs at Concordia's Faculty of Fine Arts and UQAM's Faculty of Arts. The Bronfman Laureates were also featured at the [Plural Contemporary Art Fair](#).

[Laurence Poirier](#), BFA '12 and MFA candidate in the [Department of Studio Arts](#), is the 2024 recipient of the [Brucebo Fine Art Summer Residency Scholarship](#). This award supports promising Canadian graduate students in the visual arts by offering a three-month working residency in Själlö, Sweden. Poirier's artistic practice centers around the study of material by photographing paper or ceramic sculptures, with a focus on disconnection with our environment and the use of salvaged materials.

[Ann English](#), distinguished professor emerita in the [Department of Chemistry and Biochemistry](#), won a Lifetime Achievement Award from the [Society of Porphyrins and Phthalocyanines](#). The award recognizes her as an outstanding senior scientist in the fields of heme-protein chemistry and biochemistry.

[Film and Moving Image Studies](#) program director and professor Masha Salazkina's book, [World Socialist Cinema: Alliances, Affinities and Solidarities in the Global Cold War](#) (University of California Press, 2023), has been selected as one of the best scholarly books of the year by the Chronicle of Higher Education.

[Luis Carlos Sotelo Castro](#), associate professor in the [Department of Theatre](#) and director of the [Acts of Listening Lab](#), has been awarded the Concordia Aid to Research Related Events, Exhibition, Publication and Dissemination Activities (ARRE) Grant, for his research-creation project titled "Llamado y respuesta: ¿quién escucha a César?" (Call-and-response: who listens to Cesar?). Sotelo's project explores documentary and oral history-informed theatre, coupled with choral singing, and aims to reflect on ways in which it can offer insights into the Special Jurisdiction for Peace, a Colombian war crimes tribunal.

Two Concordia-led research projects have secured more than \$5.5 million in funding from the [Canada Foundation for Innovation](#) (CFI). CFI is a non-profit corporation created by the Government of Canada that invests in research infrastructure at Canadian universities. [Christian Moreau](#), professor in the [Department of Mechanical, Industrial and Aerospace Engineering](#), and [Pantcho Stoyanov](#), associate professor in the [Department of Chemical and Materials Engineering](#), in partnership with Polytechnique Montréal and Cégep Édouard-Montpetit, received \$3.5 million for high-performance materials fabrication, characterization and performance-testing equipment. [Vincent Martin](#), professor in the [Department of Biology](#), received \$2 million for updated equipment and resources in Concordia's [Genome Foundry](#) and [Bioprocessing Centre](#). These research facilities are important hubs for biomanufacturing researchers in Canada and allow scientists to take a new organism from the initial design to large-scale production.

Once again this year, [Concordia partnered up with Le Devoir to offer a student a paid internship](#) of eight (8) weeks within the team of journalists at Le Devoir. This internship is an opportunity for the student to develop skills in journalistic work in a real newsroom, develop their abilities to work in a team and in multidisciplinary contexts, and benefit from a professional experience with Le Devoir team. The selected student will be announced in May.

The [Department of Chemistry and Biochemistry](#) signed the [Green Chemistry Commitment](#) (GCC) through [Beyond Benign](#). By participating in the GCC, the Department committed to continuing to integrate Green Chemistry into its teaching (and research) practices.

[FutureBound](#) relaunched [SkillXchange](#), a five-week cohort-based program where undergraduate students pitch and design a workshop with the support of an expert facilitator. Students developed transferable skills in workshop design, feedback, facilitation and public speaking.

[The Centre pour étudiant-es francophones' Concordance language exchange program](#) launched in January 2024 and paired francophone students with anglophone and allophone students to take turns practicing French and English. Students who participated in the program received recognition on their [Co-Curricular Record](#).

[First Year Experience](#) launched prearrival support for fall 2024 incoming students more than a month earlier than previous years, including newsletters and virtual events. This adjustment aims to connect with new students as soon as possible after they confirm their offer of admission and to align with the course registration start date.

The [Experiential Learning](#) Office has been offering the [Connect Concordia Mentorship Program](#) (CCMP) for the last three years. The program connects undergraduate mentees with a Concordia staff, faculty, or graduate student mentor over 10 hours. Mentees dive into the professional life of their mentor, learn about career paths, and experience a real-life work environment. 180 students were matched so far, this academic year with 130 mentorships completed.

There has been a lot of activity at [4THSPACE](#), including [Songwriting](#), a collaboration with the music course run by Ariane Moffatt and Alexandra Levy. Twelve songs were performed in public for the first time by Music students at 'Tiny Desk' style concert. In another first, [Re{verbe}](#) was an event conducted entirely in ASL and LSQ. Paula Bath, a Concordia Public Scholar working with d/Deaf and hearing communities, premiered a documentary about personal experiences with sign language and art-based communication. [Beyond Waste: Innovations in Plastic Upcycling](#) featured speakers from CEED Concordia, Takataka Plastics, Concordia Precious Plastics (CP3), and Concordia University Center for Creative Reuse (CUCCR) who discussed limiting and upcycling plastic waste while creating both educational and work opportunities in sustainability. [When Drugs Don't Work](#) featured Laura Domínguez Mercado, a Concordia Public Scholar working in anti-microbial resistance. She brought together Brandon Findlay from the [Department of Chemistry and Biochemistry](#) along with experts in agricultural and infectious disease microbiology to discuss current research directions in combatting the overuse of anti-biotics.

Micheál Martin, [Irish Deputy Prime Minister visited the School of Irish Studies](#) on March 15. During his speech at the Montreal St. Patrick's Society Annual Charitable Luncheon attended by a crowd of 500, he highlighted the importance of the work being done at the school and celebrated it as the leading centre of Irish studies in the world.

[Student Learning Services'](#) Pop-up Against Procrastination took place on March 27. This event helps students focus on strategic planning, studying and self-care in the intense lead-up to the end of term. 563 students attended, the majority being first or second-year undergraduates studying full-time.

On April 2, [The National Bank Initiative in Entrepreneurship and Family Business](#) hosted [Ulric Jerome, BA 00](#), a distinguished entrepreneur and investor renowned for his role in building two billion-dollar

businesses. This event is part of the researcher-practitioner exchange series, designed to ignite passion and provide invaluable insights into the entrepreneurial journey.

On April 4, [Andrew Lutfy](#), CEO of Carbonleo and sole owner, president and CEO of GDI, gave a keynote and discussed his career journey, his insights on emerging trends and innovation in real estate and where he believes the market is going. The event was organized by the Concordia Real Estate Club (CREC) in collaboration with [the Jonathan Wener Centre for Real Estate](#).

On April 8, the [Department of Physics](#) organized a "Solar eclipse viewing event" in the Loyola Quad. Physics student Palaiven Ramsamy and his team told stories, answered questions, and distributed some viewing glasses.

The Art Volt Collection [made its debut at the Plural Art fair](#) earlier this month from April 12 to 14. This marked a milestone for the [Art Volt Collection](#), an initiative that supports recent alumni of the Faculty of Fine Arts transitioning into their professional careers. Joining 39 galleries from seven Canadian cities participating in the 2024 edition of Plural, the Collection was featured in a new Pavilion Spaces section dedicated to these alternative galleries and initiatives.

On April 16, [Milieux](#) took part in the launch of the [17 Stations](#) project. Hosted at [4THSPACE](#), the experimental and interactive exhibition presented the [United Nations Sustainable Development Goals](#) (SDGs) through music, photography, Virtual Reality experience, games and local stories. The project involved more than 30 researchers from Concordia University, among them members of the Milieux Institute and, more specifically, the Immersive Storytelling Studio.

On April 25, [Milieux](#) officially announced its partnership with [MUTEK](#) Forum 10. Together with the AI Applied Institute, Milieux will co-present the first edition of the "Wilding AI Lab" on August 23.

On April 30, along with seven other speakers, [Milieux](#) director Bart Simon participated in [The Walrus Talks Series](#). The event aimed to explore how AI is impacting Canadian society, arts and culture. His intervention focused on how games help us think about AI.

In 2006, the [International Political Science Association \(IPSA\)](#) found a permanent home at Concordia. This year, Concordia marked [IPSA's 75th anniversary](#) with a conference on the challenges and new directions in multi-level governance that took place from April 25 to 26. IPSA and Concordia are also offering another [Summer Institute on Applied Diplomacy](#) in August 2024.

On April 29 and 30, the [Centre for the Study of Learning and Performance \(CSLP\)](#) organized an interdisciplinary two-day series of events featuring academic conversations, pedagogical workshops, film screenings, and art-based performances where issues surrounding "[Disinformation: Creation, Dissemination and Pedagogical Responses](#)" were tackled from multiple perspectives.

From MAY 6 to 15, the [B/OLD event series](#) examined aging in contemporary society. B/OLD 2024, took place at [4THSPACE](#), and was organized by the [Ageing + Communication + Technologies \(ACT\) Lab](#) and the [engAGE Centre for Research on Aging](#). The public "aging fair" brought together voices from diverse sectors to explore aging in contemporary society.

[CU Wellness](#) and [Health Services](#) are partnering with the [Concordia Student Union](#), [Monthly Dignity](#) and the [Douglas College Menstrual Cycle Research Group](#) to host the [Periods on Campus symposium](#) on May

17. The one-day event will bring together researchers and student advocates to focus on issues of menstrual equity, sustainability and advocacy.

The latest exhibition at the [FOFA Gallery](#), [Tidelines](#), now on display until June 7, brings together the work of Kuh Del Rosario, Miri Chekhanovich, and Cecilia McKinnon in a collaborative sculptural installation. The featured works, with their visible lifespans, evoke cycles of growth and decay, hinting at the future fate of materials within the human waste stream, where degradation occurs but permanence remains elusive.

[Ignition 19](#) is currently at the Ellen Gallery through June 1. Ignition is the annual exhibition that features new work by students enrolled in the *Studio Arts* or *Humanities* graduate programs. This year's exhibit features the works of nine students.



**SENATE
OPEN SESSION
Meeting of May 17, 2024**

AGENDA ITEM: Academic Programs Committee recommendation: New program: BEng in Cybersecurity Engineering (GCS-CIISE-5564)

ACTION REQUIRED: For approval

SUMMARY: Senate is being asked to approve a new program - BEng in Cybersecurity Engineering (GCS-CIISE-5564)

BACKGROUND:

The Gina Cody School of Engineering and Computer Science would like to offer a bachelor's program in Cybersecurity Engineering ("BEng Program"). This initiative is led by the Concordia Institute for Information Systems Engineering (CIISE), which has recognised expertise in cybersecurity.

The 120-credit BEng Program is designed for students who want a thorough education that combines core engineering with specialized cybersecurity training. It targets recent secondary education graduates and CEGEP graduates with a strong foundation in STEM, and professionals from the tech industry looking to specialize in cybersecurity. It is also ideal for career changers aiming to upskill and move into tech-centric roles. The details of the program are provided in the attached documentation.

The program was approved by the Academic Programs Committee on April 25, 2024.

DRAFT MOTION:

That, on recommendation of the Academic Programs Committee, Senate approve the new program Bachelor of Engineering in Cybersecurity Engineering (GCS-CIISE-5564), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 7, 2024

**ACADEMIC PROGRAMS COMMITTEE
REPORT TO SENATE
Sandra Gabriele, PhD
April 25, 2024**

The Academic Programs Committee requests that Senate consider the following changes for the Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposal be forwarded to Senate for approval:

Undergraduate Curriculum Proposals (Changes for the 2025-26 Calendar)

Gina Cody School of Engineering and Computer Science

Concordia Institute for Information Systems Engineering
GCS-CIISE-5564; **APC-2024-2-D1**

- New Program: BEng in Cybersecurity Engineering

GCS-CIISE-5566; **APC-2024-2-D2**

- New Program: BSc in Cybersecurity

Graduate Curriculum Proposals (Changes for the 2024-25 Calendar)

Faculty of Arts and Science

Department of Education
AS-EDUC-5510; **APC-2024-3-D1**

- New Program: Graduate Diploma in Teacher Certification (For January 2025 Implementation)

Faculty of Fine Arts

Department of Art History
FA-ARTH-5506; **APC-2024-3-D2** (For September 2025 Implementation)

- New Program: Graduate Certificate in Curatorial Studies and Practices

FA-ARTH-5507; **APC-2024-3-D3** (For September 2025 Implementation)

- New Program: Microprogram in Curatorial Studies



Sandra Gabriele, PhD
Vice-Provost, Innovation in Teaching and Learning
April 25, 2024

Summary and Rationale for Changes

The Gina Cody School of Engineering and Computer Science (GCS) would like to offer a bachelor's program in Cybersecurity Engineering. This initiative is led by the Concordia Institute for Information Systems Engineering (CIISE), which has recognised expertise in cybersecurity.

Program Rationale

Cybercrime has reached unprecedented levels in recent years. Currently, Canada employs approximately 124,000 cybersecurity professionals but urgently requires an additional 25,000, leaving one in six positions unfilled. This gap represents one of the country's biggest challenges in the digital economy. Our industry expert survey has unequivocally demonstrated the need for a dedicated BEng in cybersecurity to train next-generation cybersecurity engineers and to prepare future-ready workforce for the highly demanding cybersecurity industry. This need is further supported by the keen interest expressed by students in our surveys conducted among CEGEP and GCS undergraduate students. Our environmental scan also revealed noticeable gaps in existing educational offerings, indicating an opportune moment for new programs in cybersecurity. While Canada offers a variety of diplomas, certificates, and advanced degrees in cybersecurity, there are only four dedicated bachelor's programs in the field. Of these, two programs in Quebec universities are cumulative, designed for IT professionals with an emphasis on certificate training. The other two, offered by Ontario colleges, focus on particular tools and platforms, providing limited breadth in cybersecurity theories and methodologies.

What Distinguishes the Proposed BEng Program

Our curriculum is designed to provide extensive coverage of diverse cybersecurity aspects and the latest technological innovations. Distinct in its broad and forward-looking curriculum, the program aims to equip students with both practical skills and a profound theoretical understanding. This comprehensive approach ensures that our graduates are not just prepared for the current job market but also equipped to adapt and lead in the dynamic field, leading to sustained growth in their careers.

Target Audience

The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized cybersecurity training. It targets recent secondary education graduates and CEGEP graduates with a strong foundation in STEM, and professionals from the tech industry looking to specialize in cybersecurity. It is also ideal for career changers aiming to upskill and move into tech-centric roles.

The Concordia University Advantage

Concordia University boasts a strong research capacity in cybersecurity, featuring one of Canada's largest academic teams focused on the field. The Security Research Center (SRC) at Concordia hosts 13 faculty members, 4 industry research chairs, 30 PhD candidates, and 30 master's students dedicated to cybersecurity projects. Since 2005, Concordia has been offering two specialized master's programs in cybersecurity and a PhD program in Information and Systems Engineering. With these extensive resources and established expertise, CIISE is well-equipped to deliver a high-quality BEng program to meet the expectations of students, industry, and society.

Implementation and Financial Viability

Slated for launch in September 2025, the program is expected to attract a steady stream of applicants due to the long-term industry growth projections. Most of the resources needed to implement the program are

already available within the CIISE and GCS. The program requires no additional tenure track positions or new lab spaces. It is anticipated to generate a surplus for the University beginning in its inaugural year, ensuring sustainability and contribution to Concordia's academic reputation.

The proposed program is closely aligned with public safety mandates and current industry trends, addressing the critical need for enhanced network and infrastructure security. Additionally, CEAB accreditation will ensure that our graduates are well prepared to meet Canada's increasing demands in the professional engineering job market.

Resource Implications

The budget for the BEng in Cybersecurity Engineering is attached in the Supporting Documents.

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 17 May 2024

Approved by:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 19 Mar 2024

Following approval of the Faculty Councils, APC members reviewed the curriculum submission GCS-CIISE-5564; APC-2024-2-D1.

As a result of discussions, APC resolved that GCS-CIISE-5564; APC-2024-2-D1 be forwarded to Senate for approval.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
APC, 19 Mar 2024

Approved by:

Mourad Debbabi, Dean, Gina Cody School of Computer Science and Engineering,
GCS Council, 23 Feb 2024

Summary of Committee Discussion: Faculty Curriculum Approval (FCC/FAPC)

For Submission to:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 23 Feb 2024

Approved by:

Ali Akgunduz, Associate Dean (Academic Programs),
ESC Undergraduate Studies Committee, 19 Feb 2024

Summary of Committee Discussion: Department approval

For Submission to:

Ali Akgunduz, Associate Dean (Academic Programs and Accreditation),
Engineering and Computer Science Undergraduate Studies Committee, 19 Feb 2024

Approved by:

Chun Wang, Director, Concordia Institute for Information Systems Engineering,
CIISE Department Council, 17 Jan 2024

New Program Proposal: B.Eng. in Cybersecurity Engineering

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1. EXECUTIVE SUMMARY

The Gina Cody School of Engineering and Computer Science (GCS) would like to offer a bachelor's program in Cybersecurity Engineering. This initiative is led by the Concordia Institute for Information Systems Engineering (CIISE), which has recognised expertise in cybersecurity.

Program Rationale

Cybercrime has reached unprecedented levels in recent years. Currently, Canada employs approximately 124,000 cybersecurity professionals but urgently requires an additional 25,000, leaving one in six positions unfilled. This gap represents one of the country's biggest challenges in the digital economy. Our industry expert survey has unequivocally demonstrated the need for a dedicated BEng in cybersecurity to train next-generation cybersecurity engineers and to prepare future-ready workforce for the highly demanding cybersecurity industry. This need is further supported by the keen interest expressed by students in our surveys conducted among CEGEP and GCS undergraduate students. Our environmental scan also revealed noticeable gaps in existing educational offerings, indicating an opportune moment for new programs in cybersecurity. While Canada offers a variety of diplomas, certificates, and advanced degrees in cybersecurity, there are only four dedicated bachelor's programs in the field. Of these, two programs in Quebec universities are cumulative, designed for IT professionals with an emphasis on certificate training. The other two, offered by Ontario colleges, focus on particular tools and platforms, providing limited breadth in cybersecurity theories and methodologies.

What Distinguishes the Proposed BEng Program

Our curriculum is designed to provide extensive coverage of diverse cybersecurity aspects and the latest technological innovations. Distinct in its broad and forward-looking curriculum, the program aims to equip students with both practical skills and a profound theoretical understanding. This comprehensive approach ensures that our graduates are not just prepared for the current job market but also equipped to adapt and lead in the dynamic field, leading to sustained growth in their careers.

Target Audience

The 120-credit BEng program is designed for students who want a thorough education that combines core engineering with specialized cybersecurity training. It targets recent secondary education graduates and CEGEP graduates with a strong foundation in STEM, and professionals from the tech industry looking to specialize in cybersecurity. It is also ideal for career changers aiming to upskill and move into tech-centric roles.

The Concordia University Advantage

Concordia University boasts a strong research capacity in cybersecurity, featuring one of Canada's largest academic teams focused on the field. The Security Research Center (SRC) at Concordia hosts 13 faculty members, 4 industry research chairs, 30 PhD candidates, and 30 master's students dedicated to cybersecurity projects. Since 2005, Concordia has been offering two specialized master's programs in cybersecurity and a PhD program in Information and Systems Engineering. With these extensive resources and established expertise, CIISE is well-equipped to deliver a high-quality BEng program to meet the expectations of students, industry, and society.

Implementation and Financial Viability

Slated for launch in September 2025, the program is expected to attract a steady stream of applicants due to the long-term industry growth projections. Most of the resources needed to implement the program are already available within the CIISE and GCS. The program requires no additional tenure track positions or new lab spaces. It is anticipated to generate a surplus for the University beginning in its inaugural year, ensuring sustainability and contribution to Concordia's academic reputation.

The proposed program is closely aligned with public safety mandates and current industry trends, addressing the critical need for enhanced network and infrastructure security. Additionally, CEAB accreditation will ensure that our graduates are well prepared to meet Canada's increasing demands in the professional engineering job market.

2. PROGRAM IDENTIFICATION

2.1. Degree awarded: Bachelor of Engineering (BEng)

2.2. Discipline: Cybersecurity Engineering (BEng)

2.3. Program Title: Bachelor of Engineering in Cybersecurity Engineering

2.4. Administrative location:

University: Concordia University

Faculty: Gina Cody School of Engineering and Computer Science (GCS)

Department: Concordia Institute for Information Systems Engineering

Address: 1455 de Maisonneuve Blvd. W, Montreal, Québec, H3G 1M8, Canada

3. FIELD OF STUDY AND RELEVANCE

3.1. Field of study

Cybersecurity is a science and engineering discipline that applies the principles of engineering and natural sciences for the prevention of damage to, protection of, and restoration of computers, electronic communications systems, electronic communications services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authentication, confidentiality, and nonrepudiation¹. Cybersecurity entered the public consciousness in the late 1980s; since then, it has been evolving at break-neck speed and shows no signs of slowing down. Cybersecurity is now a core part of our modern life and represents one of the fastest growing industries worldwide. Cybersecurity has evolved to cover many difference domains, including information security, critical infrastructure security, network security, application security, storage security, cloud security, Internet of Things (IoT) security, mobile security, etc.

Cybersecurity is one of the fast-growing engineering programs at many Canadian universities. According to the Canadian Centre for Cyber Security², cybersecurity is offered as a post-secondary program at 78 Canadian institutions across eight provinces. However, only four universities are providing cybersecurity as a dedicated bachelor's degree program. This shows an urgent need for the proposed BEng degree programs in cybersecurity. Concordia University is one of the pioneers in Canada to offer dedicated master's programs on cybersecurity. Adding the proposed cybersecurity undergraduate programs to the portfolio of core disciplines will deliver a next-generation education in line with Concordia's strategic directions, which will distinguish Concordia from other universities and elevate its national research profile to the very top echelon.

In such a context, the creation of the proposed programs is motivated by the: (i) imperative to secure our IT systems against such emerging cybersecurity threats; (ii) vital obligation for governments and corporations to protect their IT systems against attacks that might lead to severe security and economic consequences, and even to the endangerment and loss of human lives. These attacks might be carried out by a wide spectrum of individuals such as criminals, cyber-terrorists, terrorists and foreign government agencies; (iii) the fast evolving nature of the cybersecurity threats to IT systems, and the corresponding need for continuously upgraded cybersecurity solutions and cybersecurity expertise; (iv) availability of the body of knowledge in cybersecurity and the essential need to train highly qualified personnel to administer and operate the security of IT systems.

The program's main academic aim is to prepare students for a career in cybersecurity through comprehensive training in the latest technologies and industry best practices. It's designed to develop graduates who are ready to secure critical systems across key sectors including government, healthcare, and telecommunications. Additionally, the curriculum focuses on fostering research skills, engaging students in applied research to examine existing theories and their impact on cybersecurity practices.

3.2. Areas(s) of expertise

To be accredited by the Canadian Engineering Accreditation Board (CEAB), the BEng program is an in-depth, 120-credit program that provides a comprehensive education in cybersecurity, embedded in a strong engineering foundation. Unlike other programs that offer cybersecurity as a specialization within other degrees, our BEng program will provide over 60 credits specifically in cybersecurity, delivering a comprehensive and rigorous education in this field.

The program curriculum is designed to immerse students in both the theoretical underpinnings and practical applications of cybersecurity. It combines rigorous coursework with hands-on practice to prepare graduates for the multifaceted challenges they will face in the field. A variety of pedagogical approaches will be employed, including work-integrated and blended learning, as well as laboratory training, to enrich students' learning experiences. These methods support the program's dual focus on core cybersecurity principles and the latest industry practices.

¹ <https://csrc.nist.gov/glossary/term/cybersecurity>

² <https://cyber.gc.ca/en/guidance/appendix-b-post-secondary-cyber-security-related-programs>

Comprehensive and Multidisciplinary Curriculum

The proposed BEng program offers a rich, multidisciplinary curriculum that marries core computer science concepts with advanced cybersecurity knowledge. Students will gain proficiency in key areas such as cryptography, secure system design, access control, and network security, complemented by practical skills in penetration testing, risk management, and incident response. The program's depth is further enhanced by electives in cutting-edge areas like smart grid and IoT security, ensuring graduates are equipped to address the challenges of modern digital infrastructures. This broad-spectrum approach prepares students for versatile professional roles, integrating core engineering principles with the dynamic field of cybersecurity.

Work-Integrated Learning Across Curriculum

The BEng program is uniquely structured to weave cybersecurity courses throughout the entire curriculum, ensuring continuous exposure and learning in the field, in contrast to other programs that typically concentrate cybersecurity education into the later stages as a specialization. This structure allows students to participate in multiple cybersecurity-related co-op internships. Our program offers a robust Cooperative Education (Co-op) program through the Institute for Cooperative Education. Backed by CIISE's extensive cybersecurity research and industry connections, the program enables students to accrue valuable field experience within industry settings under the joint supervision of an industrial mentor and a faculty member, greatly enhancing job readiness.

Industry and Government Collaboration

The curriculum will also be enriched by various types of partnerships with leading industry players and government agencies, as evidenced by the strong interest in collaboration shown in our industry survey. A significant number of course and research projects in the program will be supported by industrial partners such as Hydro-Québec, Thales, Ericsson, and government agencies such as Public Safety Canada. In addition, we will leverage the CIISE's Advisory Board's industrial/government members to create effective feedback loops that continually enhance both the program and our cybersecurity research.

Concordia's strong academic and research foundations in cybersecurity provide a unique value proposition to potential students, both domestic and international. Refer to Section 7 for further details.

4. PROGRAM RATIONALE

4.1. Socio-economic and socio-cultural opportunities

4.1.1. *Economic, social, and cultural needs*

Cybercrime has reached unprecedented levels in recent years. In Canada, according to Statistics Canada's annual report³ "Impact of cybercrime on Canadian businesses 2021" (released on 2022-10-18), almost one-fifth (18%) of Canadian businesses were impacted by cyber security incidents in 2021, in contrast to 21% of Canadian businesses in both 2019 and 2017 that were impacted. This includes 16% of small businesses (10 to 49 employees), 25% of medium businesses (50 to 249 employees), and 37% of large businesses (250 or more employees) who report being impacted by cyber security incidents in 2021. The situation in other countries is similar, e.g., according to the annual report of FBI's Internet Crime Complaint Center⁴, there are 850,000 complaints in 2021 leading to potential losses exceeding \$6.9 billion in the US alone.

The nature of cybercrime threats has continuously evolved as well, with ransomware, business e-mail compromise (BEC) schemes, and the criminal use of cryptocurrency among the top incidents reported. In particular, according to Statistics Canada, the most common types of cybersecurity incidents identified by business in 2021 were incidents related to theft of money or demand for ransomware payments (7%) and incidents related to theft of personal or financial data (6%). The Communications Security Establishment (CSE), Canada's foreign signals intelligence agency, reported 235 ransomware incidents against Canadian victims from Jan. 1 to Nov. 16 in 2021, with more than half of those targets being critical infrastructure providers, including those in the energy, health and manufacturing sectors. While most impacted businesses identified external parties (61%) as the perpetrator of cyber security incidents, 38% of impacted businesses could not identify the perpetrator. Other perpetrators identified were internal parties (5%) and known third parties (6%), like a supplier or customer.

The financial impact of cybersecurity incidents to businesses has been skyrocketing in the past years. According to Statistics Canada, in 2021, 11% of Canadian businesses that were impacted by a cyber security incident were due to ransomware attacks, which has become more known and utilized by attackers in recent years. Among these businesses, a large proportion (82%) reported that they did not pay the ransom, whereas a smaller proportion (18%) reported that they made a ransom payment and 1% of those were reportedly paying more than \$500,000 (among which 14% of did so with cryptocurrency). In the US, according to FBI, the amount lost from the cybersecurity incidents jumps from \$4.2 billion (2020) to \$6.9 billion (2021), which largely stems from scams like extortion, identity theft, and data breaches. The financial impact of cybersecurity incidents to businesses also come in many other forms. According to Statistics Canada, in 2021, about 40% of businesses that were impacted by a cyber security incident (which amount to 18% of all businesses) also experienced downtime as a result, with an average downtime duration of 36 hours, which may imply significant losses of businesses. Other commonly reported impacts of cybersecurity incidents included additional time required by employees to complete their day-to-day work (21%), prevention of employees from carrying out their day-to-day work (18%), and loss of revenue (14%). Canadian businesses impacted by a cyber security incident reported to have spent a total of slightly over 600 million dollars to recover, an increase of about 200 million dollars from 2019. In addition to such direct impact, cyber attacks can also imply additional expenses of businesses to detect or prevent such attacks. According to Statistics Canada, in 2021, the percentage of businesses that reported spending additional money on cybersecurity solutions remained stable in 2021 (61%) compared with 2019 (62%). However, the amount of money spent to detect or prevent cyber security incidents by Canadian businesses has increased by about \$2.8 billion in 2021 to \$9.7 billion when compared with 2019. Among these, large businesses contributed about half of the total (\$4.4 billion), and small businesses spent \$2.9 billion and medium businesses spent \$2.4 billion.

In addition to financial impact, cyber attacks can also generate significant social and cultural impact affecting the daily life of millions of Canadians. For instance, the following lists some of the recent high-profile cyber incidents in Canada:

³ <https://www150.statcan.gc.ca/n1/daily-quotidien/221018/dq221018b-eng.htm>

⁴ https://www.ic3.gov/Media/PDF/AnnualReport/2021_IC3Report.pdf

- In February 2022, two Quebec factories, the Alouette aluminum plant in Sept-Îles and the Bridgestone tire plant in Joliette, were victims of separate cyberattacks. Bridgestone has stopped production in all its factories in North America and Latin America while it conducts an internal investigation.
- In May 2022, IKEA confirmed an internal security breach that has impacted the personal information of up to 100,000 Canadians, when some of those customers' personal information appeared in a generic search made by an IKEA employee.
- On October 30, 2021, the Canadian province of Newfoundland and Labrador suffered a cyberattack that led to severe disruption to healthcare providers and hospitals. The attack caused regional health systems to shut down their networks and cancel thousands of medical appointments for chemotherapy, x-ray scans, surgeries, and other specialist services. The IT outage also affected communications in the region, with people reporting an inability to reach the health care centers or 911 via phone.
- On June 14, 2021, Humber River Hospital in Ontario was forced to shut down its IT systems due to ransomware, forcing staff to declare a code grey (a loss of essential services) with clinics cancelled and ambulances redirected. To prevent the ransomware from encrypting files, the hospital immediately shut down all of its over 3,000 computers and servers, leaving hospital staff including pharmacy professionals unable to access electronic patient records.
- On December 14, 2021, Superior Plus, Canada's largest propane distributor with roughly 800,000 customers across the U.S. and Canada, announced a major ransomware attack that started on December 12, 2021. To secure the internal system during the attack and start the investigation process, Superior Plus temporarily disabled certain computer systems and applications. Additionally, the company drafted cybersecurity experts to help deal with the incident and assess the impact of the breach. A similar case also happened to Superior's biggest competitor, AmeriGas, which was also impacted by a cyberattack earlier that year.
- In November 2020, Home Depot Canada started receiving the first reports of the data breach that, according to the official press release, "seems to be the result of an internal system error rather than an external attack". Its customers started receiving reminder emails by mistake for hundreds of orders that were ready to pick up, in some cases users reported receiving up to 1,000 emails per one address or even more. The email content included customer names, email addresses, order numbers, and the last four digits of customer payment.
- In June 2019, it was reported that Desjardins exposed personal data of over 10 million customers over nearly two years without being noticed. The security department became aware of it only after the organization had been notified by the federal Privacy Commissioner. According to the commissioner's report, the rogue employee siphoned sensitive personal information collected by Desjardins from customers including first and last names, dates of birth, social insurance numbers, street addresses, phone numbers, emails, and transaction histories.
- In November 2018, Canada Post leaked the personal data and orders of thousands of cannabis smokers. the Ontario Cannabis Store (OCS), the only legal supplier in the region at the time of that accident, reported that hackers accessed the order records of 4,500 customers – it's roughly 2% of the firm's customer base. The compromised information included names or the initials of nominated signatories, postcodes, dates of delivery, OCS reference numbers, Canada Post tracking numbers, and OCS corporate names and business addresses.
- In May 2017, Bell Canada reported its largest customer data breach which affected close to 1.9 million customer email addresses, as well as 1,700 names and phone numbers. The responsibility for the attack wasn't named, but in the information released it was mentioned the hackers were leaking the information due to Bell's failure to cooperate with them.

Given the increasing prevalence and sophistication of cyber threats, the proposed BEng program is more than an academic response—it's a societal imperative. By nurturing a cadre of skilled cybersecurity professionals, the program directly contributes to safeguarding our socio-economic and socio-cultural spheres. Graduates from this program will serve as the frontline defense against cyber threats that target critical infrastructure, financial institutions, and personal data, thereby maintaining the integrity of our societal functions.

4.1.2. Evolution of the fields in Quebec

The fields of Cybersecurity and Critical Infrastructure Security (CIS) are rapidly evolving, and the province of Quebec has emerged as a focal point for these advancements in Canada. This evolution is evidenced through a series of concerted efforts made by the Quebec government, educational institutions, and the industry sector, reflecting a broad-based commitment to fostering growth in this field.

Government initiatives and policies

In recent years, the Quebec government has launched several initiatives and policies aimed at promoting innovation and strengthening cybersecurity. One significant move in this regard is Quebec's Digital Innovation Strategy 2017-2022⁵, which allocated substantial funding to drive digital transformation across diverse sectors. This forward-looking strategy identified key areas for development, such as cloud computing and big data. In addition, initiatives such as the Smart Cities Challenge⁶ further underscore the commitment of the Quebec government to integrate cyber-physical systems in urban environments. This competition encourages municipalities to create smart, innovative solutions using data and connected technologies. Cybersecurity plays an important role in ensuring the viability of those initiatives.

Meanwhile, the provincial government has set objectives to make cybersecurity a priority, ensure public services are secure, and keep citizens informed and confident⁷. This focus dovetails with the creation of the Ministry of Cybersecurity and Digital (Le ministère de la Cybersécurité et du Numérique), officially established on January 1, 2022, led by Minister Éric Caire. The Ministry's establishment is a pivotal part of Quebec's strategy to meet the challenges of cybersecurity and public service digitization⁸. With the launch of its first strategic plan for 2023-2027 (Dépôt du Plan stratégique 2023-2027 du ministère de la Cybersécurité et du Numérique), the Ministry has pledged to bolster the province's defenses against cyber threats⁹.

These government-led endeavors underscore a comprehensive approach to fostering innovation and securing the digital landscape. These measures serve not only to protect against emerging cyber threats but also to cultivate a skilled workforce adept in cyber and critical infrastructure security, crucial for Quebec's evolving digital ecosystem.

Education and research

Quebec has experienced significant growth in cybersecurity related areas within its higher education and research institutions. These institutions have developed extensive programs and research facilities to support the growth of cybersecurity expertise. For instance, Polytechnique Montréal offers a range of cybersecurity educational opportunities from undergraduate to graduate level and specialized certificate program. Concordia's Gina Cody School of Engineering and Computer Science, through its Concordia Institute for Information Systems Engineering (CIISE), provides specialized graduate programs and excels in cryptography and system security research. Furthermore, the Université de Montréal has made strides with its Artificial Intelligence for Cybersecurity Lab, contributing to the confluence of AI and cybersecurity.

The creation of the Multidisciplinary Institute for Cybersecurity and Cyber Resilience (IMC²) marks an even more significant step forward in Quebec's academic sector. IMC² is a collaboration between Polytechnique Montréal,

⁵ Québec Research and INNOVATION STRATEGY 2017-2022, <https://publicsectornetwork.com/insight/quebec-research-and-innovation-strategy-2017-2022>

⁶ <https://www.ville.quebec.qc.ca/villeintelligente/>

⁷ <https://www.quebec.ca/gouvernement/politiques-orientations/vitrine-numeriqc/politique-gouvernementale-de-cybersecurite#:~:text=%E3%80%91>

⁸ <https://incyber.org/quebec-cree-ministere-cybersecurite/#:~:text=Comme%20annonc%C3%A9%20en%20d%C3%A9cembre%202021,%C2%BB%2C%20dirig%C3%A9%20par%20Eric%20Caire>

⁹ <https://www.quebec.ca/nouvelles/actualites/details/depot-du-plan-strategique-2023-2027-du-ministere-de-la-cybersecurite-et-du-numerique-48575>

Université de Montréal, and HEC Montréal, pooling the expertise of 44 professors and their research teams to provide leading-edge research, innovation, and training in cybersecurity and cyber resilience¹⁰. IMC² also aims to create links between academia and external cybersecurity players such as the NPO Cybereco and the IN-SEC-M cluster, significant contributors to the cybersecurity ecosystem in Quebec and Canada.

Quebec boasts over 30 research chairs and labs, including the research chair (Dr. Mourad Debbabi) in cyber-physical security at Concordia University partnering with Hydro-Québec and Thales, directly applying cybersecurity knowledge in safeguarding critical infrastructures, and the Desjardins/National Bank Industrial Research Chair in Cybersecurity at Polytechnique Montréal, dedicated to studying AI applications in cybersecurity¹¹. These resources significantly enhance the province's educational and research capabilities, fostering specialized programs that meet the evolving needs of these technological fields.

Moreover, Quebec's R&D landscape is thriving with projects that integrate AI with cybersecurity, propelled by substantial investment and collaborative partnerships. A notable example is Concordia University's cutting-edge research in AI and cybersecurity, which has been bolstered by a substantial \$2.25-million grant from National Defence¹². These efforts underscore the province's commitment to advancing education and research in cybersecurity.

Industry growth and demand

Quebec has witnessed a significant rise in demand for cybersecurity and Critical Infrastructure Security (CIS) skills, a trend in line with Canada's position as the fourth-ranked global destination for foreign investment in the cybersecurity sector¹³. This surge is largely driven by the province's growing reliance on technology across diverse critical sectors, such as healthcare, transportation, energy, and utilities, necessitating advanced CIS capabilities. This demand aligns with the nationwide trend where specialized skills, particularly in cybersecurity and AI, are in high demand yet in short supply, as noted by the Industrial Relations Centre at Queen's University¹⁴.

Moreover, Quebec's thriving tech industry, with its vibrant start-up scene and tech hubs, has further stimulated the demand for these skills. Quebec boasts a robust IT network, comprising over 230,000 professionals, 18,000 university students, and about 10,000 IT companies. The presence of many world-class cybersecurity leaders, low costs, and generous government support have made Quebec an attractive location for cybersecurity investments. The province has attracted major companies like GoSecure, Hitachi Systems Security, and RHEA Group, which have contributed to a vibrant ecosystem that supports and drives the demand for these specialized skills.

With strategic governmental initiatives and policies, a thriving academic and research environment, and burgeoning industry and market demand, Quebec is placing itself at the forefront of innovation in cybersecurity and CIS. These factors collectively contribute to an expanding landscape ripe for a new program tailored to these crucial skills.

4.1.3. Justification of the proposed program

Given this context, the demand for skilled cybersecurity professionals has become unprecedented. Employers across Quebec and Canada are seeking highly qualified personnel to design, implement, deploy, and operate the security of products, services, and systems. The employment demand in this area is rapidly outpacing the supply, driven by an ever-evolving threat landscape, more frequent cybersecurity incidents, geopolitical tensions, and the paramount need to secure ICT systems. This trend is expected to continue, fueled by global political, economic, and social changes, the

¹⁰ <https://www.polymtl.ca/salle-de-presse/en/newsreleases/launch-multidisciplinary-institute-cybersecurity-and-cyber-resilience-imc2>

¹¹ <https://www.investquebec.com/international/en/press-room/news/Quebec-A-True-Cybersecurity-Hub.html#:~:text=Canada%2C%20the%20fourth,Here%E2%80%99s%20what%20motivated%20their%20choices>

¹² <https://www.investquebec.com/international/en/press-room/news/Quebec-A-True-Cybersecurity-Hub.html>

¹³ <https://www.investquebec.com/international/en/press-room/news/Quebec-A-True-Cybersecurity-Hub.html>

¹⁴ <https://irc.queensu.ca/hot-skills-in-a-dynamic-canadian-labour-market/>

expansion of ICT, and escalating security risks. We are entering an age where intelligent systems will become increasingly deployed and integrated across almost all sectors of our societies (e.g., aerospace, automotive, energy, transportation, healthcare, defense, and manufacturing), necessitating sophisticated security solutions.

A 2021 study by the Information and Communications Technology Council (ICTC), a national, not-for-profit centre of expertise that aims to strengthen Canada's digital advantage, estimates that Canada currently employs approximately 124,000 cybersecurity professionals but urgently requires an additional 25,000, leaving one in six positions unfilled. This gap represents one of the country's biggest challenges in the digital economy. Also, according to TECHNATION, the national association representing Canada's information, communications, and technology (ICT) industry, there is an average of 4,000 vacancies in cybersecurity jobs on any given day, with around 20 per cent of those jobs going unfilled, a rate that is increasing year by year.

As such, it is anticipated that the employment demand and the enrolment for the proposed BEng program will be very high and increasing, particularly due to the scarcity of similar academic offerings within Quebec and Canada. The bachelor's degree continues to be the credential of choice for many in the cybersecurity field. According to [careeronestop.org](https://www.careeronestop.org)¹⁵, 42 percent of those working in cyber security hold a bachelor's degree, as opposed to 25% with a master's degree and 16% with some college or professional training. With over two decades of experience in training master's level cybersecurity experts, CIISE has seen consistent enrollment growth, suggesting the BEng program is likely to attract even greater interest. The proposed BEng program offers a comprehensive four-year curriculum that integrates computer science fundamentals with specialized cybersecurity knowledge and practical, hands-on training, utilizing the school's unique research and teaching facilities. Graduates of this program can be hired by different layers of governments, corporations, and industry to fight the ever-evolving security threats to IT systems.

4.1.4. Student Interest Surveys

4.1.4.1 CEGEP student survey

At a recent open-house, CIISE surveyed 106 attendees, predominantly CEGEP students (65%), revealing a significant interest in cybersecurity studies at Concordia University. About half of the respondents had already investigated if cybersecurity programs were available at Concordia, and a substantial 74% (79/106) expressed moderate to high interest in a BEng in cybersecurity. Additionally, 73% (78/106) requested to receive more information about our program by leaving their contact information.

The survey also highlighted key factors influencing these prospective students' university choice: post-graduation career prospects, availability of a co-op program, and course offerings emphasizing practical, career-ready programs. Overall, the survey data demonstrates a clear market for the program and the importance of aligning it with student aspirations and industry needs. See *Appendix 5* for detailed survey results and analysis.

4.1.4.2 Concordia GCS undergraduate student survey

To assess interest in the proposed program, we also surveyed 2,500 undergraduates in Gina Cody School of Engineering and Computer Science at Concordia University, of which 536 responded (a 21% response rate). These students were studying in two main areas: 30% in Computer Science and 70% in various Engineering programs. The survey probed students' likelihood to enroll, the program's alignment with their academic and professional goals, and their interest in related offerings such as a BSc or minor. It also invited open-ended feedback and suggestions.

Out of 534 respondents to the related question (Q3), a majority expressed positive interest in applying if the program became available, with 36% indicating they are 'very likely' to apply and 22% as 'likely'. A smaller group, 17%, said they were 'somewhat likely' to apply. Additionally, many students see the program as closely aligned with their academic and professional objectives, which suggests that our program design is relevant to their future career aspirations.

¹⁵ <https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Information%20Security%20Analysts&location=UNITED%20STATES&onetcode=15121200>

Students also shared some ideas about how the program could be enhanced. The most frequent suggestion was co-op opportunities (which we do provide). There's also interest in other forms of Cybersecurity education, like a Bachelor of Science or a minor, which points to a broader interest in the field beyond the BEng program.

The open feedback we received echoed this interest, with students showing enthusiasm for the program's potential and a desire for its timely implementation. They're looking for a program that is flexible, up-to-date, and provides a smooth transition from other majors. The quality of teaching and regular curriculum updates were also highlighted as crucial for the program's success. In sum, the survey indicates strong support for the proposed BEng in Cybersecurity. The insights gained are invaluable for program development, even though they represent a portion of the student population. See *Appendix 5* for detailed survey results and analysis.

4.1.5. Industry Expert Survey

A survey reaching out to 50 industry experts through CIIS faculty networks received 39 detailed and insightful responses from a wide array of professionals, from executive leaders to technical specialists, across many sectors such as aerospace, power/energy/utilities, technology consulting, telecommunications, finance, healthcare, and defence. These individuals' roles span strategic and technical functions, reflecting the varied cybersecurity challenges and diverse industry needs that our program aims to address.

Market demand for cybersecurity professionals

The market demand for cybersecurity expertise is expected to grow considerably, as evidenced by 97% of survey respondents who indicated a 'very likely' surge in job demand over the next five years. Furthermore, a significant 79% recognized either a 'critical need' or 'high need' for training and skill updating in cybersecurity-related roles. Additionally, 55% of all respondents reported facing challenges when attempting to hire skilled cybersecurity personnel for their organizations.

Essential knowledge and skills

The following topics/areas and skills were identified by the survey respondents as essential and in high demand:

Topics and Areas

- Cloud Security: Knowledge of major cloud platforms like AWS, GCP, Azure.
- DevSecOps and Cloud Native Security: Emphasis on integrating security into development operations.
- AI/ML and Quantum Computing: Understanding the implications of these technologies for cybersecurity.
- Critical Infrastructure Protection: Focus on securing computer networks, telecommunications, and control systems.
- Hands-On Experience: Importance of practical projects and real-world scenario training.
- Interdisciplinary Knowledge: Combining IT architecture, legal aspects, and business operations.

Skills in High Demand

- Cloud Security: Particularly in cloud-native environments.
- Threat Identification and Response: Skills like threat hunting and incident management.
- Vulnerability and Risk Management: Including ethical hacking and compliance knowledge.
- System and Network Security: Essential technical skills in these areas.
- AI and ML: Growing importance in the cybersecurity domain.
- Communication and Documentation: Crucial for effective cybersecurity management.

Importance of interdisciplinary expertise

The survey indicates a strong consensus among respondents on the importance of interdisciplinary knowledge in cybersecurity, with 97% of respondents rating it as "very important" or "somewhat important" (Q19). Communication, particularly in the context of managing public relations during a cyber incident, and legal knowledge, especially regarding the implications of data breaches, are both frequently mentioned as crucial interdisciplinary areas for cybersecurity professionals. Risk assessment and an understanding of new technologies such as AI, cloud

infrastructure, and network security also recur as areas of importance (Q20). These repeated mentions underscore the demand for a skill set that extends beyond technical expertise to include strategic, legal, and communicative competencies.

Overall professional competencies

Among six key professional competencies presented to the survey respondents (Q17), *Problem-solving skills* and *Ethical judgment and integrity* are most valued (both marked as “critically important” by 24 respondents). *Continuous/lifelong learning* follows closely receiving 23 ratings for being “Critically important”. When combining the “Critically important” and “Very important” categories, the top three valued skills are *Technical proficiency* (34), *Problem-solving skills* (33), and *Ethical judgment and integrity* (33), followed by *Continuous/lifelong learning* (31). While *Communication skills* and *Teamwork and collaboration* are less emphasized overall, they are recognized as “Very important” or “Critically important” by 25 and 23 respondents respectively. These findings highlight the critical need for a holistic skill set in cybersecurity, emphasizing not just technical proficiency, but also problem-solving, ethical decision-making, and a commitment to continuous learning and adaptability.

Experiential Learning Opportunities

When asked what types of experiential learning or work-integrated opportunities their organizations can provide to our program students (Q23), out of 35 responses, 27 selected onsite internships or co-op and 21 chose research collaborations, followed by mentorship opportunities (16) and course-based experiential learning (16). Other opportunities include virtual internship (9), field projects (6), live case studies or simulations (6), industry sponsored competitions (6), job shadowing (5), reflecting a wide range of industrial collaboration possibilities for enriching the curriculum with ample opportunities for practical applications.

Industry Partnerships and Collaboration

Survey respondents showed a strong inclination towards collaborating with our cybersecurity programs, particularly in joint research, guest lectures, workshops, and advisory committee roles, with 21/33 interested in each of those activities. Additionally, 18 respondents were keen on contributing to course design. Mentorship, networking events, and offering specialized lab access also received several votes, indicating diverse collaboration opportunities.

Key trends and anticipated changes

In responding to the open-ended questions probing industry trend, surveyed experts shared that cybersecurity professionals are likely to face a rapidly evolving threat landscape over the next decade, driven by the integration of AI and quantum computing into the fabric of cybersecurity. The program must address current trends like DevSecOps, cloud security, and the protection of critical infrastructure, while also preparing students for the future, where AI-driven attacks, quantum encryption, and the security of remote work will become focal points. As regulations tighten and the need for privacy safeguards grows, professionals will be required to adapt to emerging technologies and maintain a continuous learning mindset to stay ahead of sophisticated cyber threats.

These insights directly from industry experts provide a focused roadmap for curriculum development of the proposed program. See *Appendix 5* for detailed survey results and analysis.

4.1.6. Current and Projected Cybersecurity Job Market in Quebec and Canada

Market Demand and Salary Trends

The data from LightCast job posting analytics over the last five years (Feb 2019 - Jan 2024) indicates a thriving cybersecurity job market in Quebec for those with a bachelor’s degree, with 1,268 unique job postings from 252 different employers. The median advertised salary (revealed by 3% of total postings) stands at \$104,200, higher by \$15,500 than the government’s recorded median for cybersecurity specialists in the region. In contrast, Canada-wide data shows 9,913 unique job postings with 2,245 employers. The median salary across Canada (revealed by 10% of total postings) is reported at \$95,000 (surpassing the government’s recorded median by \$5,400), indicating a healthy demand and remuneration for cybersecurity expertise at the national level.

Five-year Job Posting Trends

The past five-year trend in cybersecurity job postings for bachelor's degree holders in Quebec shows fluctuations without clear upward or downward trend, except for a pronounced spike in early 2021. This surge is likely linked to the COVID-19 pandemic's impact, which led to increased remote work and consequently, greater cybersecurity needs, as supported by findings from [McKinsey¹⁶](#), [Deloitte¹⁷](#), and [Statistics Canada¹⁸](#). The investments in cybersecurity measures during the pandemic, such as increased spending on prevention and detection, suggest that the heightened awareness and need for robust cybersecurity will likely persist into the future.

In contrast, the Canada nation-wide data indicates a general upward trend with some variability. Notably, there is a significant rise in postings around February 2021, similar to the trend observed in Quebec. This peak could be indicative of a nationwide response to the cybersecurity challenges posed by the pandemic, with increased demand for professionals holding a bachelor's degree in related fields. The trend also seems to stabilize at a higher level post-2021 compared to the pre-pandemic era, suggesting a sustained demand for qualified cybersecurity professionals across Canada. The fluctuations following the peak indicate that while there may be seasonal or economic factors affecting job postings, the overall market for cybersecurity expertise remains robust. This implies that the pandemic-induced increase in cybersecurity job postings is likely not a temporary spike but a reflection of a more persistent demand in the job market. See the visuals of both job posting trends in the full Lightcast Job Posting Reports included in *Appendix 5*.

Top Five Hiring Companies

The table below shows the top five employers of cybersecurity specialists along with the total number of unique postings for each employer in Quebec and Canada over the past five years.

Rank	Employer in Quebec	Postings (Quebec)	Employer in Canada	Postings (Canada)
1	Bell	96	TD Bank	425
2	Desjardins Group	67	Procom	264
3	Bonidollars	58	Bell	227
4	Banque Nationale	58	TELUS	221
5	Morgan Stanley	50	Deloitte	201

Top Ten Job Titles

The table below shows the top ten cybersecurity job titles in demand along with the number of unique postings for each job title for both Quebec and Canada:

Rank	Job Title (Quebec)	Unique Postings (Quebec)	Job Title (Canada)	Unique Postings (Canada)
1	Cybersecurity Specialists	72	Information Security	535

¹⁶ McKinsey & Company: <https://www2.deloitte.com/ch/en/pages/risk/articles/impact-covid-cybersecurity.html>

¹⁷ Deloitte: <https://www2.deloitte.com/ch/en/pages/risk/articles/impact-covid-cybersecurity.html>

¹⁸ Statistics Canada: <https://www150.statcan.gc.ca/n1/pub/22-20-0001/222000012023001-eng.htm>

			Analysts	
2	Cybersecurity Analysts	63	Cybersecurity Analysts	484
3	IT Security Analysts	42	Cybersecurity Specialists	402
4	Information Security Analysts	38	Cybersecurity Managers	299
5	Vulnerability Management Analysts	35	Information Security Specialists	272
6	Security Advisors	33	Information Security Managers	239
7	Specialist Information Security Analysts	28	Cybersecurity Consultants	198
8	Identity and Access Management Managers	26	IT Security Analysts	185
9	Cybersecurity Managers	25	Security Analysts	171
10	Cybersecurity Consultants	22	Technology Risk Managers	154

See the two full Lightcast reports in *Appendix 5* for more details.

4.1.7. Future prospects for graduates

Cybersecurity engineering, like all engineering programs at Concordia, will be accredited by Engineers Canada. The accreditation process includes evaluation by the Canadian Engineering Accreditation Board (CEAB) carried out at periodic intervals (currently every six years). Accreditation of an engineering program ensures that the necessary knowledge and skills are being acquired to practice engineering safely and responsibly in Canada. Although the accreditation requirements evolve, the principles of assuring competency in key areas remains consistent. The proposed cybersecurity engineering program provides students with the graduate attributes required by Engineers Canada and exceeds the academic unit requirement in all categories, which is presented in Section 7.1.3.

Cybersecurity engineers are typically trained to be the designers, analysts, and administrators of information technology (IT) systems and operational technology (OT) systems in both public and private sectors. There is a growing demand of cybersecurity engineers within the Government of Canada¹⁹; specifically, federal organizations such as Canadian Security Intelligence Service (CSIS), Public Safety Canada (PS), Communications Security Establishment (CSE), Royal Canadian Mounted Police (RCMP), and Shared Services Canada (SSC) actively recruit cybersecurity professionals. Cybersecurity engineers are also involved in operations, development, planning, and technical support. As cybersecurity is integral to almost all organizations and businesses, cybersecurity engineers also find employment in sectors related to IT/OT (management, banking, healthcare, insurance, policy, and more). Their training and skills often complement those of decision makers and executives in the secure operation of businesses.

¹⁹ <https://www.publicsafety.gc.ca/cnt/ntnl-scr/cbr-scr/cbr-crr-wrnss>

Cybersecurity engineers are related to software engineers and computer engineers. However, there are distinct focus areas within each field. Software engineers primarily focus on the software development life cycle, while computer engineers are involved with the design of computer hardware. Cybersecurity engineers are dedicated to securing diverse cyber space. This includes the design and development of technologies to secure both software and hardware along with many other related components (such as networks, cyber-physical systems, human behavior). The proximity of the fields of software, computer, and cybersecurity engineering provides opportunities for cross-fertilization. The proposed program will equip cybersecurity engineers with a solid grasp of the software and hardware aspects of their profession. This will expand the opportunities for graduates, especially in Canada, where software is a growing industry accounting for \$68.9 billion in operating revenue in 2020²⁰.

In both traditional and emerging sectors (with the wide-spread adoption of information technologies), graduates of a few existing Canadian cybersecurity engineering programs benefit from high-quality education, ensured to some extent by the required accreditation. Cybersecurity engineering at Concordia will be subject to these same requirements but will also benefit from Concordia's unique positioning regarding emerging technologies (e.g., 5G, IoT, Cloud computing, etc.) and applied AI, both of which will be included in the program and will therefore provide uniquely qualified graduates with highly marketable skills. The depth and multi-disciplinary nature of the proposed program also provides many opportunities for research globally, with many cutting-edge developments leveraging novel computational techniques and data science, and increasingly being driven toward secure solutions. These contemporary skills and perspectives also provide increased professional mobility for graduates between economic sectors and job categories.

The government of Canada outlines the career guide in cybersecurity²¹. As reported, cyber security professionals are in high demand in Canada due to several reasons. First, any device that is connected to the Internet is vulnerable to cyber-attacks. Additionally, there will be estimated 38.6 billion Internet-connected devices by 2025²². Moreover, cyberattacks happen every 39 seconds²³. Furthermore, in 2021, 11% of Canadian businesses were affected by a cybersecurity incident (totalling \$796 million loss)²⁴. Finally, it is projected that Canadians and Canadian organizations will become more and more victims of cyberthreats in the upcoming years²⁵.

Cybersecurity professionals work in diverse fields and perform important roles including, defending our nation, securing our telecommunications infrastructure, safeguarding our money, protecting our electrical distribution systems, protecting our identities, ensuring our medical information remains private, stopping ransomware attacks, and many more. Stated by the report from the Government of Canada²⁶ graduates of cyber security programs tend to be quickly recruited by public and private sector organizations. The shortage of cyber security professionals is so pronounced (e.g., 25,000 unfilled positions in 2022²⁶) that a skilled graduate of a cyber security program will certainly be an attractive candidate for many employers. Specifically, a BEng cybersecurity graduate can hold entry level positions, such as IT security specialist, Security tester, Incident responder, Cyber security operations analyst, and Vulnerability analyst, as well as other positions with work experience, such as Cyber security researcher, Cyber security engineer, Cyber security architect, Digital forensic analyst, Information system security manager, and Cyber security manager.

Another important factor driving the continuously growing demand for cybersecurity professionals at the bachelor's

²⁰ <https://www150.statcan.gc.ca/n1/daily-quotidien/220314/dq220314c-eng.htm>

²¹ <https://www.cyber.gc.ca/en/guidance/cyber-security-career-guide>

²² <https://www.strategyanalytics.com/access-services/devices/connected-home/consumer-electronics/reports/report-detail/global-connected-and-iot-device-forecast-update>

²³ <https://www.securitymagazine.com/articles/87787-hackers-attack-every-39-seconds>

²⁴ <https://www150.statcan.gc.ca/n1/daily-quotidien/221018/dq221018b-eng.htm>

²⁵ <https://www.cyber.gc.ca/en/guidance/national-cyber-threat-assessment-2020>

²⁶ <https://www.ictc-ctic.ca/news-events/one-in-six-canadian-cybersecurity-roles-go-unfilled-new-report-explores-talent-shortage-and-solutions>

level is the new cybersecurity regulations and compliance requirements rolled out by federal and provincial governments. For example, the government of Quebec has recently established a dedicated ministry on cybersecurity (Ministère de la Cybersécurité et du Numérique, MCN). The ministry has issued directives on security and information (Directive gouvernementale sur la sécurité de l'information)²⁷ with new information security obligations for public bodies, such as: 1) set up appropriate committees and working groups, 2) ensure management of information security, deploy related security measures, and monitor the implementation, and 3) develop and implement formal, ongoing training and awareness programs for its staff, among others. These new regulations and requirements alone will necessitate the creation and hiring of a dedicated information security management and operation team within each public bodies of the government.

Similar regulations and recommendations are also being rolled out by the federal government through its National Cyber Security Strategy²⁸. In particular, under the new cybersecurity landscape and threats in Canada²⁹, many critical infrastructure sectors and services, such as energy, food, health, manufacturing, and transportation, are facing growing threats. These sectors, however, are significantly less prepared and staffed against growing cyber threats than the information & communication technology and finance sectors. According to the Statistics Canada³⁰, over 25% of enterprises in oil and gas, construction, wholesale trade, rail transportation, banking, higher education, R&D services, and other industries have reported at least one cyber incident in 2021. Such growing demand is widening the cybersecurity talent gap and calling for more trained workforce to fill in the opening positions.

Given the high market demand, the salaries for cybersecurity engineers are also very competitive. Table 1 shows a summary of the employment of cybersecurity professionals in the US based on the Bureau of Labor Statistics. In 2021, the median pay of a cybersecurity professional was \$102,500 per year and \$49.33 per hour. The typical entry level education of those professionals is a bachelor's degree with an average related work experience of less than five years. The total number of posted cybersecurity professional jobs was 163,000. The number is expected to grow over the next ten years (till 2031) with a growth of 35% (which is much faster than the average) with an employment change of 56,500. These statistics clearly demonstrate the growing need of cybersecurity professionals.

Table 4.1. Employment summary for cybersecurity professionals in the US (source: Bureau of Labor Statistics)

2021 Median Pay	\$102,600 per year \$49.33 per hour
Typical Entry-Level Education	Bachelor's degree
Work Experience in a Related Occupation	Less than 5 years
On-the-job Training	None
Number of Jobs, 2021	163,000
Job Outlook, 2021-31	35% (Much faster than average)
Employment Change, 2021-31	56,500

National Occupational Classification (NOC) 2021 Version 1.0³¹ from the Government of Canada entitles Cybersecurity specialists (21220) along with their main responsibilities and employment requirements.

²⁷ https://www.tresor.gouv.qc.ca/fileadmin/PDF/ressources_informati.../directives/directive_securite_information2021.pdf
²⁸ <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/ntnl-cbr-scrt-strtg/index-en.aspx>
²⁹ <https://www.cyber.gc.ca/en/guidance/national-cyber-threat-assessment-2023-2024>
³⁰ <https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=2210007601>
³¹ <https://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=1322554&CVD=1322870&CPV=21220&CST=01052021&CLV=5&MLV=5&adm=0&dis=0>

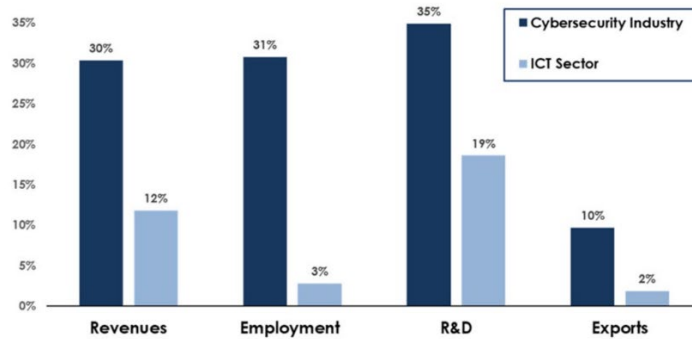


Figure 4.1. Performance of Key Variables, the Canadian Cybersecurity Industry vs. the Broader ICT Sector, (% Change, 2018-2020)

Table 4.2. 2020 GDP Economic Impact of Canada's Cybersecurity Industry

Cybersecurity Industry	Canadian Suppliers to the Cybersecurity Industry	Cybersecurity Industry and Value Chain	Consumer Spending by Associated Employees	Cumulative Total GDP
\$1.6B	\$0.8B	\$2.4B	\$0.8B	\$3.2B

Table 4.3. 2020 Jobs Economic Impact of Canada's Cybersecurity Industry

Cybersecurity Industry	Canadian Suppliers to the Cybersecurity Industry	Cybersecurity Industry and Value Chain	Consumer Spending by Associated Employees	Cumulative Total GDP
14,100 jobs	7,800 jobs	21,900 jobs	7,500 jobs	29,400 jobs

4.2. Systemic Relevance and Opportunity

The proposed BEng Cybersecurity program is strategically positioned to address the growing demand on cybersecurity engineers who design, construct, and maintain safety and security critical cyber and cyber physical systems which are mandated by the government regulations. This demand has not been adequately addressed by existing programs in Canada and Quebec. In the context of the landscape of cybersecurity programs available in Canada and Quebec, the important and unique value proposition offered by the proposed program is poised to sustain its stable growth.

Table 4.4. Post-secondary cybersecurity related programs in Canada (source: Canadian Centre for Cyber Security).

	Alberta	British Columbia	Manitoba	New Brunswick	Nova Scotia	Ontario	PEI	Quebec	Saskatchewan	Total
Cybersecurity Bachelor's Programs	0	0	0	0	0	2	0	2	0	4
Bachelor's Programs with Cybersecurity Specialization	4	2	0	1	0	4	0	2	0	13
Master's Programs	2	2	0	1	0	8	0	4	0	17
Graduate Certificate/Diploma	9	2	1	1	0	21	3	7	1	45
Certificate, Diploma and Microprograms	12	2	6	5	3	21	2	43	0	94

4.2.1. Cybersecurity programs in Canada

Canada currently offers 4 cybersecurity bachelor’s programs, 13 computer science and software engineering bachelor’s programs with cybersecurity specializations (concentrations or options), as well as 17 cybersecurity master’s programs at 22 universities. Besides the above-mentioned degree programs, there are also a variety of 94 diplomas, certificates, graduate certificates and undergraduate programs offered by CEGEPs, colleges, and universities in 9 provinces. Table 4.4 provides a summary of the numbers of different types of programs offered across provinces in Canada.

Table 4.5 Summary of cybersecurity bachelor's programs and bachelor's programs with cybersecurity specialization in Canada (Other than Quebec)

	Institution	Degree	Credits required in cybersecurity courses
Cybersecurity Bachelor's Programs	Seneca College (ON)	Honours Bachelor of Information Technology – Cybersecurity	60 credit (20 courses) + Co-Op
	Sheridan College (ON)	Honours Bachelor of Information Sciences (Cyber Security)	60 credit (20 courses) + Project
Bachelor's Programs with Cybersecurity Specialization	Concordia University of Edmonton (AB)	Bachelor of Management	12 credits (4 courses)
	MacEwan University (AB)	Computer Science – System and Information Security	12 credits (4 courses)
	The King's University (AB)	Computer Science – Secure Computing Stream	12 credits
	University of Calgary (AB)	Computer Science (Information Security Concentration)	5 courses + 1 Project
	British Columbia Institute of Technology	Bachelor of Technology (Digital Forensics and Cybersecurity)	26 credits
	British Columbia Institute of Technology	Bachelor of Science (Network Security Applications Development)	15 credits + 1 Project
	University of New Brunswick	Computer Science – Cybersecurity specialization	12 credits (4 courses)
	Carleton University (ON)	Computer and Internet Security (BSc stream)	2 courses
	University of Ontario Institute of Technology	Networking and Information Technology Security (Bachelor of Information Technology)	6 courses + 1 Project
	University of Toronto Mississauga	Computer Science (H.B.Sc.) Specialist Program in Information Security	4 courses + 1 Project
	York University	Computer Security (BSc)	5 courses + 1 Project
	York University	Computer Security (BA)	5 courses + 1 Project

Among others, cybersecurity bachelor’s programs and bachelor's programs with cybersecurity specialization are particularly related to this proposal. Table 4.5 provides a summary of existing cybersecurity bachelor’s programs and bachelor's programs with cybersecurity specialization in the provinces of Canada other than Quebec. We will provide a detailed summary of those programs in the province of Quebec in the next sub-section.

As shown in Table 4.5, outside Quebec, two cybersecurity bachelor’s programs are offered by Seneca College and Sheridan College respectively. These are regular 120 credit bachelor's programs suitable for high school graduates in

Ontario school systems. Both programs require 60 credits from cybersecurity courses. The Honours Bachelor of Information Technology – Cybersecurity offered by Seneca College also requires co-op. The Honours Bachelor of Information Sciences (Cyber Security) offered by Sheridan College only requires a cybersecurity project, not a co-op.

Table 4.6 show the specializations offered in Canadian universities (in both bachelor’s and master’s programs). The most common specialization is information systems security followed by data security and privacy and network security. None except Queen’s master’s program focuses on AI for cybersecurity which might be an essential knowledge for the near future. Additionally, almost no existing bachelor’s programs combine the concept of emerging technologies (e.g., cloud computing, 5G, IoT, blockchains, cyberphysical systems, etc.) with cybersecurity, however, these topics might become the most critical cybersecurity challenges in Canada for the upcoming years.

Table 4.6. Specialization options offered in the Cybersecurity programs in Canada.

	Information Systems Security	Information systems security	Information system assurance	Secure computing	Network security administration	Network Security Applications	Digital forensics	Telecommunications security	Computer and Internet security	Data Security and Privacy	Informatics	Threat intelligence	IT security	Identity management	Governance and auditing	Digital innovation	Infrastructure Protection	Cybersecurity law
Concordia (AB)	1	1	1															
MacEwan (AB)	1																	
King’s (AB)				1														
Calgary (AB)	1																	
BCIT (BC)					1	1	1											
NYIT(BC)	1								1	1		1						
Victoria (BC)	1							1										
New Brunswick (NB)	1				1				1						1			
Carleton (ON)									1								1	
Northeastern (ON)	1				1				1	1								
Queen’s (ON)	1				1		1								1			
Ryerson (ON)		1								1						1		
Seneca (ON)	1										1	1						
Sheridan (ON)	1																	
Guelph (ON)												1						
Ontario Tech (ON)	1				1								1					
Toronto (ON)	1							1		1				1				
York (ON)									1						1			1
Concordia (QC)	1				1		1			1							1	
Poly Montreal (QC)										1								
UQO (QC)																1		

4.2.2. Cybersecurity programs in Quebec

Table 4.7 shows the list of Quebec universities and Cégep colleges and the cybersecurity programs and certifications they currently offer. Considering the number of programs offered, it is evident that cybersecurity related programs are popular among Quebec Cégep colleges. As shown in Table 4.7 there are around 40 cybersecurity related programs offering Diploma of College Studies (DCS) and Diploma of College Studies (DCS) in Quebec. Master's programs are offered at Concordia University and Université de Sherbrooke (in French). Graduate certificates, and microprograms are offered at McGill University, HEC Montreal, Laval University, University of Sherbrook, Polytechnique Montréal, and Université du Québec en Outaouais.

Table 4.7 Summary of cybersecurity programs in Quebec

Institute	Program title	Certification
Cégep de l'Outaouais	Techniques de l'informatique - Programmation et Sécurité (in French)	Diploma of College Studies (DCS)
	Techniques de l'informatique - Réseaux et Cybersécurité (in French)	Diploma of College Studies (DCS)
Cégep de Saint-Hyacinthe	Techniques de l'informatique - Réseaux et Cybersécurité (in French)	Diploma of College Studies (DCS)
Cégep de Sherbrooke	Cybersécurité et sécurité intégrée (in French)	Attestation of College Studies (ACS)
Cégep Garneau	Cyberenquête (in French)	Attestation of College Studies (ACS)
	Cybersécurité (in French)	Certificate
Cégep Limoilou	Techniques de l'informatique - Gestion des réseaux (in French)	Diploma of College Studies (DCS)
Cégep Saint-Jean-sur-Richelieu	Administration des réseaux et sécurité informatique (in French)	Attestation of College Studies (ACS)
Champlain College Saint-Lambert	Cybersecurity, Prevention and Intervention	Attestation of College Studies (ACS)
Collège Ahuntsic	Techniques de l'informatique - profil réseaux et sécurité (in French)	Attestation of College Studies (ACS)
	Techniques de l'informatique - profil réseaux et sécurité (in French)	Diploma of College Studies (DCS)
Collège de Bois-de-Boulogne	Techniques de l'informatique - Profil Infrastructures et Sécurité (in French)	Diploma of College Studies (DCS)
Collège de Maisonneuve	Gestion de réseaux et sécurité des systèmes (in French)	Attestation of College Studies (ACS)
	Techniques de l'informatique - Infrastructure et Sécurité des réseaux (in French)	Diploma of College Studies (DCS)
Collège LaSalle	Techniques de l'informatique - Gestion de réseaux et sécurité (in French)	Diploma of College Studies (DCS)
Collège Lionel-Groulx	Administration des réseaux et sécurité informatique (in French)	Attestation of College Studies (ACS)
Collège Montmorency	Prévention et intervention en cybersécurité (in French)	Attestation of College Studies (ASC)
	Techniques de l'informatique - Spécialisation : Réseaux et sécurité informatiques (in French)	Diploma of College Studies (DCS)
Collège Rosemont	Microprogramme de perfectionnement en sécurité des réseaux (in French)	Attestation of College Studies (ACS)
	Techniques de l'informatique - Profil réseautique : sécurité et virtualisation (in French)	Diploma of College Studies (DCS)
Concordia University	Information Systems Security (MAsc)	Masters
	Information Systems Security (MEng)	Masters
	Cybersecurity Proficiency	Certificate
Cumberland College	Cybersecurity Specialist	Attestation of College Studies (ACS)
HEC Montréal	Analyse d'affaires - cybersécurité	Certificate
	Analyse d'affaires - cybersécurité (in French)	Microprogram
	Analyse d'affaires – Technologies de l'information (in French)	Diploma of Higher Specialized Studies (DESS)

	Transformation numérique des organisations (in French)	Masters
Heritage College	Microsoft Network and Security Administrator	Attestation of College Studies (ACS)
Institut supérieur d'informatique	Computer Networks and Security	Attestation of College Studies (ACS)
	Réseaux Informatiques et Sécurité (in French)	Attestation of College Studies (ACS)
Kensley College	Cyber Security and Ethical Cyber Piracy	Attestation of College Studies (ACS)
McGill University	Applied Cybersecurity	Certificate (online)
	Cybersecurity	Graduate Certificate
Polytechnique Montréal	Analysis and operational cybersecurity (in French)	Undergraduate Certificate
	Architecture et gestion de la cybersécurité (in French)	Certificate
	Cyberenquête (in French)	Certificate
	Cyberfraude	Certificate
	Internet industriel des objets	Certificate
	Security and Computer Mobility	Bachelor's in Computer Engineering
	Security and Mobility in Software	Bachelor's in Software Engineering
	Cybersecurity (in French, for computer professionals)	Cumulative Bachelor's
	Cyberinvestigation (in French)	Microprogram
	Internet industriel des objets	Microprogram
	Networking and Security (in French)	Microprogram
	Réseautique et sécurité (in French)	Microprogram
Université du Québec en Outaouais	Cybersécurité (in French)	Professional Graduate Certificate
	Gouvernance et cybersécurité (in French)	Certificate
	Innovation numérique (in French)	Cumulative Bachelors
	Réseaux informatiques et cybersécurité (in French)	Certificate
	Certificat en gestion de technologies d'affaires (in French)	Certificate
	DESS en gestion de technologies d'affaires (in French)	Certificate
Université Laval	Administration des affaires – gouvernance de la sécurité de l'information (in French)	Graduate Certificate
Université de Sherbrooke	Gouvernance, audit et sécurité des technologies de l'information (in French)	Diploma of Higher Specialized Studies (DESS)
	Gouvernance, audit et sécurité des technologies de l'information (in French)	Microprogram
	Gouvernance, audit et sécurité des technologies de l'information (GASTI) (in French)	Masters
	Sécurité informatique (in French)	Diploma of Higher Specialized Studies (DESS)
	Sécurité informatique – volet prévention (in French)	Microprogram
	Sécurité informatique – volet réaction (in French)	Microprogram

Closely related to the proposed BEng. program, in Québec, two universities (École Polytechnique, and Université du Québec en Outaouais) currently offer cumulative bachelor's degrees in cybersecurity. In addition, these universities also offer bachelor's degrees in computer engineering, software engineering, and computer science with cybersecurity specialization. Table 4.8 provides a detailed summary of cybersecurity bachelor's programs and bachelor's programs with cybersecurity specialization offered at Quebec universities.

Table 4.8 Detailed summary of cybersecurity bachelor's programs and bachelor's programs with cybersecurity specialization offered at Quebec universities.

	Institution	Degree	Program Structure	Suitable Applicants
Cybersecurity Bachelor's Programs	Polytechnique Montréal	Accumulative Bachelor's in Cybersecurity (in French, must be admitted to one of the certificate programs first. Cannot apply directly to the cumulative bachelor's degree).	3 certificates in cybersecurity (30 credits each). At least two of them offered at Polytechnique Montréal. Program offered online.	Intended for IT professionals who want to equip themselves with concrete tools to work in the field of cyber security. - Hold or be in the process of obtaining a college diploma (DCS) in a computer science field. - Attestation of Collegial Studies (ACS) AND at least two (2) years' relevant experience
	Université du Québec en Outaouais	Accumulative Bachelor's in Innovation numérique (in French, must be admitted to one of the certificate programs first. Cannot apply directly to the cumulative bachelor's degree).	Management stream, 3 undergraduate certificates, 30 credits each. Two certificates in Administration, Governance and Cybersecurity, and Business Technology Management. And a third certificate from Computer Networking and Cybersecurity and Information Technology	Holders of D.E.C or 30 credits in a university program.
Bachelor's Programs with Cybersecurity Specialization	Polytechnique Montréal	Bachelor's in Computer Engineering -Security and Computer Mobility (in French)	27 credits, last year concentration 5 courses required +Project 2 grad level elective courses	Holders of D.E.C or 30 credits in a university program.
	Polytechnique Montréal	Bachelor's in Software Engineering - Security and Mobility in Software (in French)	27 credits, last year concentration 5 courses required +Project 2 grad level elective courses	
	Université du Québec en Outaouais	Bachelor's in Computer Science (in French, with Co-Op option)	90 credits 18 credits cybersecurity courses	Holders of D.E.C or 30 credits in a university program.

École Polytechnique offers a Bachelor of Cybersecurity via accumulation of certifications. This cumulative bachelor's degree is based on undergraduate certificates offered on cyber investigation, cyber fraud, IIoT, analysis and operational cybersecurity, and cybersecurity. The degree requirement is to complete at least two certificates offered at École Polytechnique. A third certificates can be obtained from pre-selected certificate programs offered at HEC Montreal and University of Montreal. The program is Intended for IT professionals who want to equip themselves with concrete tools to work in the field of cyber security. Applicants to the program should have completed fundamental computer science courses through computer science college diploma or related working experiences.

In addition to the accumulative Bachelor of Cybersecurity offered at École Polytechnique, Université du Québec en Outaouais offers an accumulative Bachelor's in Innovation Numérique which can be tailored to a cybersecurity bachelor's program which allows students to select two certificates which can cover 60 credits in cybersecurity courses. However, the courses are designed to accommodate the background of management stream students.

In terms of Bachelor's programs with cybersecurity specialization, Université du Québec en Outaouais offers a Bachelor's in Computer Science with specialization in Computer Networks and Cybersecurity. This specialization includes courses in system security as well as cybersecurity governance. The students completed at least 30 credits in their bachelor's are eligible to enrol for this specialization. Even though this helps the students to obtain cybersecurity concentrations on specific skills, this initiative does not provide a complete bachelor program in cybersecurity covering its multi facets. École Polytechnique offers both Computer Engineering and Software Engineering bachelor programs with specialization in cybersecurity. Both programs require 30 credits in cybersecurity courses for graduates to specialize in cybersecurity.

4.2.3. The market position of the proposed cybersecurity BEng. program

Our detailed environmental scan and analysis of the landscape of cybersecurity related programs offered at Canadian universities and colleges revealed several gaps in the market, presenting important opportunities for new programs. In the following, we provide a detailed description of these gaps and explain how our proposed cybersecurity BEng. program can uniquely position itself among related programs in the Canadian market by leveraging our existing resources and unique strengths in the field to capitalize on those opportunities.

1. Bachelor's program in cybersecurity is underrepresented in the Province of Québec and in Canada. Despite relatively large number of cybersecurity related college diplomas, undergraduate and graduate certificates offered in Canada, in total, only four bachelor's programs in cybersecurity are available in the Canadian market. Specifically, two of them offered at Quebec universities are accumulative bachelor's programs. Only two Ontario colleges offer dedicated regular cybersecurity bachelor programs in Canada. In contrast, there are more than 200 bachelor's degrees in cybersecurity offered in USA³². As such, bachelor's program in cybersecurity is underrepresented in Canada. The outcomes of our industry expert survey also clearly support this observation.

The two cybersecurity accumulative bachelor's programs are offered at Polytechnique Montréal and Université du Québec en Outaouais. These programs emphasize on certificate training and targeting IT professionals and students who already have computer science diplomas and/or related working experience. They have a different targeted student population than that of the proposed BEng. Program. Two Ontario colleges namely Seneca College and Sheridan College offer regular cybersecurity bachelor's programs targeting high school graduates. The cybersecurity courses designed for these programs focus more on specific tools and platforms commonly used in the industry with rather narrow scopes and limited exposure to the fast-evolving body of cybersecurity theories and advanced approaches.

Compared to these programs, our proposed B.Eng. program has much broader coverage of different aspects of cybersecurity and cutting-edge cybersecurity technologies. In addition to hands on experiences, the design of our courses also equips students with deeper understanding of the subject matters at theory level, which empowers students to develop their understanding and skills with the evolution of the technologies and challenges in the field.

Concordia has several unique advantages in the development of a new undergraduate program with unique value propositions to the potential students in Canada and abroad. Benefiting from a very well-established leading cybersecurity research group in the country, we can offer courses with broader coverage and in several cutting-edge disciplines, including IoT, cloud computing, telecommunications, financial crypto, AI for cybersecurity. These areas reflect the uniqueness of Concordia's offering by providing advanced and applied topics in cybersecurity. These areas give competitive advantage for Concordia students by advancing their knowledge in key strategic areas for the future of cybersecurity and are rare or unique specialty tracks in other Canadian universities. We have the expertise in the faculty members to offer courses cover all

³² <https://cybersecurityguide.org/programs/cybersecurity-bachelors-degree/#Schools>

specializations listed in Table 4.6. We can also maintain favorable student/faculty ratio in the program supported by a group of 13 faculty members available for teaching specialized cybersecurity courses and other faculty members available for teaching general theory and math courses.

2. A dedicated B.Eng. in cybersecurity is not currently offered by Canadian universities. According to the outcomes of our industry expert survey and the results of our market research, such a program is needed in the Canadian market. The proposed program will be accredited by CEAB, which will be among the very first such programs offered in Quebec and in Canada. A CEAB-accredited program will open the door for our graduates to work as professional engineers in Canada, which will be highly demanded in the future job market. École Polytechnique offers Bachelor programs in computer engineering and software engineering with cybersecurity specializations. Although these are also accredited programs, they are not dedicated bachelor programs in cybersecurity, and they don't have the coverage in terms of breadth and depth that our proposed program will provide.

Compared with these cybersecurity specializations, the proposed B.Eng. program requires more than 60 credits in cybersecurity courses, which provides a much broader and rigor treatment to the subject. The diverse topics offered include information system assurance, information systems security management, system and information security, secure computing, network security administration, network security applications development, digital forensics, telecommunications and information security, computer and Internet security, data security and privacy, informatics and security, threat intelligence, IT security, identity, privacy and security (IPS), governance and auditing, digital innovation. Leveraging the strong capacity of CIISE faculty members in a wide range of theoretical and practical topics, we will offer a unique program to students looking to work in a variety of emerging areas in cybersecurity, such as application of machine learning and artificial intelligence (AI) to cybersecurity, critical infrastructure security, and cybersecurity in Industry 4.0 and IoT.

3. A strong co-op program is critical in terms of providing students with the necessary working experiences needed by the potential employers.

The bachelor's programs with cybersecurity specializations listed in Table 4.5 usually require 4 to 5 cybersecurity courses to complete a cybersecurity specialization³³. The program structure of a general degree program with cybersecurity specialization obligates the cybersecurity specialized courses to be scheduled towards the end of the program. In most of the cybersecurity specializations listed in Table 4.5, cybersecurity courses are scheduled for the last year the bachelor's program in the format of technical elective courses, which makes it difficult for these programs to offer cybersecurity co-op internships to the students.

In contrast, the structure of the proposed BEng program has clear advantages over the general degree with cybersecurity specialization programs in terms of providing strong co-op experiences for students to integrate modern skill capacity development for an evolving job market. The proposed B.Eng. program systematically introduces cyber security courses along the years, which allows students to participate in multiple cybersecurity co-op internships in their program, which will be very valuable for preparing students for the cybersecurity job market. The CIISE department is successfully hosting two master's programs (MASc and MEng) in information systems security since 2003 with significant increase in its enrolment and strong impact on the community over the years. Our alumni are holding vital positions in both public and private sectors and both in practice and academia, which provides important resources for supporting out co-op programs. In addition, CIISE currently has 13 faculty members working on cybersecurity research, four of them are NSERC Industrial chairs in cybersecurity. Given its strong cybersecurity profile and industry connection

³³ With the exception of the Bachelor of Technology (Digital Forensics and Cybersecurity) offered by the British Columbia Institute of Technology. This program requires 26 credits in cybersecurity related courses. However, this program focuses more on digital forensics, which is not the main focus of a regular cybersecurity undergraduate program.

established by the cybersecurity research group within the institute, the proposed program is poised to provide students with rich and rewarding co-op experiences.

4.2.4. Partnerships and Collaborations

Foreseeable links to related programs, potential collaborations between professors in the new program and related ones in other institutions. The proximity of McGill University and École Polytechnique to Concordia University creates favourable conditions for collaborations with professors in these institutions. Furthermore, there is a history of collaboration between engineering professors at these three universities.

Research groups of particular interest are:

- From McGill University: Dr. Benjamin Fung (artificial intelligence (AI) applications for cybersecurity), Dr. Zeljko Zilic (applied cryptography and blockchain), Dr. Steven H. H. Ding (malware analysis), and others.
- From École Polytechnique Montréal: Dr. Nora Boulahia Cuppens (cryptography and intrusion detection), Dr. Frédéric Cuppens (risk analysis and network security), and others.
- From the Department of Computer Science and Software Engineering: Dr. Emad Shihab (software engineering and management), Dr. Jinqiu Yang (automated program repair), Dr. Peter C. Rigby (software engineering practices), Dr. Abdelhak Bentaleb (cloud computing, Internet of Things), and others
- From the Department of Electrical and Computer Engineering: Dr. Otmane Ait Mohamed (formal verification), Dr. Walaa Hamouda (physical layer security), Dr. Kash Khorasani (cyber physical security), and others.

At master's level training, CIISE is partnering with Department of Electrical and Computer Engineering to develop a new MEng. program in Cyber Physical and Critical Infrastructure Systems & Security. This joint master's program will leverage the expertise from both departments to train next-generation practitioners and researchers in Cyber Physical and Critical Infrastructure Systems & Security, which are highly demanded in today's industry digitalization economy.

The Security Research Center (SRC) at Concordia University also partnered with other institutions to conduct cybersecurity training of professionals. Notable collaboration includes the training programs for the Ministère de la Cybersécurité et du Numérique (MCN), Ericsson Canada, Hydro Québec, and Deloitte.

In addition to professional trainings, the SRC, which hosts all CIISE professors working on cybersecurity, has established a longstanding tradition of collaborative R&D with industrial partners. For example, Concordia and Ericsson have collaborated on numerous projects over the years. In a recent project funded by the National Cybersecurity Consortium (NCC) under the Cyber Security Innovation Network (CSIN), researchers from CIISE partner with communications technology company Ericsson and researchers from Concordia, the University of Waterloo and the University of Manitoba to build cyber resilient and secure 5G network through automation and AI. The project will receive \$1 million from the NCC over three years. Matching funds of \$1.2 million will come from Concordia, Ericsson and the University of Manitoba.

In addition to cybersecurity, professors from CIISE also build partnerships and collaborations with governments and organizations in the domain of cybersecurity. For example, CIISE is currently home to seven active research chairholders in critical infrastructure security, including four NSERC Industrial Research Chairs, one Tier-2 Concordia University Research Chair, one Tier-2 Concordia University Research Chair, and one Gina Cody Research Chair, who led multiple edge-cutting research collaborative projects with partners from industry with over \$8 million external research funds:

- 1) Mourad Debbabi, NSERC/Hydro-Québec/Hitachi Senior Industrial Research Chair in Smart Grid Security (\$2.3 million between 2016-22; renewed in 2023)
- 2) Lingyu Wang, NSERC/Ericsson Senior Industrial Research Chair in Software-Defined Networking and Network Functions Virtualization Security (\$1.8 million)
- 3) Jeremy Clark, NSERC/Raymond Chabot Grant Thornton/Catallaxy Industrial Research Chair in Blockchain Technologies (\$1.38 million)
- 4) Roch Glitho, NSERC/Ericsson/ENCQOR 5G Senior Industrial Research Chair in Cloud and Edge Computing for 5G

and Beyond (\$2.67 million)

- 5) Chadi Assi, Concordia University Research Chair (Tier 1) in Broadband Wireless Networks
- 6) Jun Yan, Concordia University Research Chair (Tier 2) in Artificial Intelligence in Cyber Security and Resilience
- 7) Carol Fung, Gina Cody Research Chair in IoT/Cybersecurity

The R&D partnerships held by these chairs include various key stakeholders in cybersecurity, including the Government of Quebec, Autorité des marchés financiers (AMF), Public Safety Canada, Department of National Defence (DND), Office of Privacy Commissioner (OPC), Hydro-Quebec, Ericsson, Ciena, Rheinmetall, and many others.

Smart, sustainable, and resilient cities and communities is another research area in which CIISE professors have partnerships and collaborations with various organizations. For example, Dr. Chun Wang is a co-cluster director at Concordia's Next-Generation Cities Institute focusing on Mobile, Secure and Sharing Cities. Other professors, for example, Drs. Chadi Assi, Jun Yan, Nizar Bouguila, Manar Amayri, and Mohsen Ghafouri also have collaborative projects with Next-Generation Cities Institute in the areas of digitalization, cybersecurity, AI, smart and secure building, smart and secure transportation and mobility.

The program will also collaborate with several organizations to ensure its better engagement with the underrepresented community in the field of cybersecurity. In particular, the Women in CyberSecurity (WiCyS) Concordia chapter will work with its other chapters to announce the news of this new program about enrolment, admission, scholarships, etc., and to ensure broader outreach of this program. Similar initiatives will also take place in collaboration with Annual Canadian Celebration of Women in Computing Conference (CAN-CWiC) and other similar events.

These long-term partnerships and collaborations will provide a rich environment for providing hands-on training and experiential learning opportunities for the proposed undergraduate cybersecurity program which makes the program unique and attractive.

4.3. Institutional Relevance and Opportunity

Concordia University has defined nine strategic directions for a next-generation academic institution, four of which come through strongly in the creation of the proposed program:

Teach for tomorrow – Exposing students to realistic industry projects, expertise, and working environments through our strong partnerships and collaborations with the industries and governments provides tremendous value to training next-generation cybersecurity engineers. Virtual labs and other online learning modules provide students with multiple opportunities to gain experience and interact with the up-to-date and dynamic cyberworld. This provides the skills, knowledge, and tools for graduates to adapt to a variety of working, learning, and creating environments.

Get your hands dirty – Concordia enjoys a strong and robust experiential learning office, which will expand to meet the needs of the cybersecurity engineering undergraduates and thus provide fulfilling opportunities for hand-on learning. In addition, given the strong industry collaboration and research foundation of CIISE, undergraduate students can be recruited to work on a variety of industry sponsored projects by faculty members in the department. Students will have first-hand experience in understanding the need, scope, and complexity of the design, development, testing and maintenance of cyber and cyber-physical systems.

Grow smartly – Based on the current and future market demand for cybersecurity engineering education opportunities in Québec, enrolment in cybersecurity engineering is expected to quickly increase to match the explosive growth of cyberspace and digitalization of physical space, such as digital twin. The projected enrollment found in Section 4.1 shows a rapid increase from 50 students initially, to a mature annual enrollment of 100 students.

Embrace the city, embrace the world – As the sustainability of the cities increasingly rely on digitalization to improve resource utilization and coordination, the proposed undergraduate program can have a strong focus on the security aspects of digitalized cities and the world enabling interdisciplinary connections and outreach to exhibit novel approaches and solutions for contemporary problems. For example, the blockchain knowledge built by the program can prepare students to design tracking and auditing methodologies in the areas of pollution control, climate change mitigation, energy transition.

The program will be complementary to existing programs at Concordia University. The programs most closely related to the proposed BEng in Cybersecurity Engineering are the BEng in Software Engineering and the BEng in Computer Engineering. The overlap with these programs will be roughly one year (30 credits). Discussions with other departments will be held and courses will be shared with these programs whenever this makes sense.

Currently, faculty members in CIISE are already contributing to other BEng programs in Engineering, particularly by teaching the courses Discrete Mathematics (COEN 231) and Information Systems Security (SOEN 321). Additional contributions are anticipated, for instance by teaching courses such as Probability and Statistics in Engineering (ENGR 371).

Successful undergraduate program builds solid foundation and provides tremendous benefits to the cybersecurity research activities at Concordia by training talents in the domain early on, attracting top students to graduate programs, and build strong alumni communities which foster research collaborations with the industries. Concordia University's Strategic Research Plan 2023-2028 identifies four thematic areas that engage our research community and our partners in solving fundamental questions and finding innovative solutions to several pressing societal challenges. The proposed undergraduate program is closely related to several sub-thematic areas such as cybersecurity, cyberphysical systems, communications technologies, climate change and sustainability, medical devices, critical infrastructure.

Concordia has prioritized research in disciplines and domains that accelerate progress towards decarbonized and resilient economies, cities, and communities through electrification research. CIISE professors are also actively involved in the Electrification Decarbonization and Resilient Communities Canada First Research Excellence Found initiative led by Concordia university. Power grid efficiency and security, secure integration of new technologies for smart grid, secure integration of electrified transportation, charging infrastructures and smart buildings are the conner stone of the electrification of the society. Several professors, namely Drs. Chadi Assi, Jun Yan, Nizar Bouguila, Manar Amayri, Mohsen Ghafouri, Chun Wang, Amin Hamed, have responded to the first EDRC seed call by submitting project proposals either as PIs or co-PIs. These projects demonstrate strong and on-going collaborations with researchers and other institutes within and outside Concordia and a variety of industry partners.

With the proposed undergraduate program in place, Concordia will only broaden its impact on the electrification of the cities and societies by leveraging its already established research and training capabilities in critical infrastructure security and secure integration of power, electrified transportation, renewable energy resources and smart buildings.

5. PROGRAM OBJECTIVES

5.1. Output Profile

The Canadian Engineering Accreditation board (CEAB) requires engineering programs to have a system to assess 12 graduate attributes³⁴. The GCS has identified indicators for these 12 attributes, shown in Table 5.1. The mapping of the attributes and indicators throughout the curriculum is available in Section 7.5. These 12 attributes reflect key characteristics that graduates need to possess to become licensed engineers in Canada.

Table 5.1. Graduate attributes from the Engineers Canada Accreditation Board and selected indicators from the GCS.

Graduate attributes	Indicators
A knowledge base for engineering	Knowledge base of mathematics
	Knowledge base of natural science
	Knowledge base in specific domain
Problem analysis	Problem identification and formulation
	Modelling
	Problem solving
	Analysis (uncertainty and incomplete knowledge)
Investigation	Background and hypothesis formulation
	Designing experiments
	Conducting experiments and collection of data
	Analysis and interpretation of data
Design	Define the objective
	Idea generation and selection
	Detailed design
	Validation and implementation
Use of engineering tools	Ability to use appropriate engineering tools, techniques and resources
	Ability to select appropriate tools, techniques, and resources
	Demonstrate awareness of limitations of tools, create and extend tools as necessary
Individual and teamwork	Cooperation and work ethics
	Contribution: practical/conceptual
	Initiative and leadership
	Delivering results
Communication skills	Writing process
	Information Gathering
	Documentation
	Oral presentation
Professionalism	Role and responsibilities of professional engineers
	Professional practice
Impact of engineering on society & the environment	Awareness of society and environment impact
	Sustainability in design
Ethics and equity	Professional ethics and accountability
	Equity
Economics and project management	Fundamentals of economics
	Economics evaluation of projects
	Project planning and implementation

³⁴ <https://engineerscanada.ca/sites/default/files/Graduate-Attributes.pdf>

Life-long learning	Identifying missing knowledge and learning opportunities
	Continuous improvement and self-learning

We have identified the following key trends for undergraduate cybersecurity engineering programs are:

1. **Emphasis on Fundamentals:** A strong foundation in the technical aspects of cybersecurity, including cryptography, network security, and security protocols, is essential.
2. **Practical Experience:** Graduates must have hands-on experience in designing, implementing, and managing secure systems, networks, and applications.
3. **Focus on Privacy:** Privacy is a critical issue in the digital world, and graduates must understand how to protect individuals' privacy rights and the legal and ethical implications of data breaches.
4. **Compliance and Regulations:** Graduates must have a strong understanding of cybersecurity laws and regulations, including data protection laws and cybersecurity frameworks like NIST and ISO.
5. **Emerging Technologies:** Students should be exposed to emerging technologies like artificial intelligence and blockchain, and how they could impact cybersecurity.
6. **Risk Management:** Graduates should be familiar with the risk management process, including risk identification, assessment, mitigation, and monitoring.
7. **Communication and Collaboration:** Cybersecurity professionals must be able to communicate effectively and work collaboratively with other professionals, such as IT teams, executives, and legal departments. These skills must be emphasized in undergraduate programs.
8. **Industry Tools and Technologies:** Graduates should be familiar with industry-standard tools and technologies such as firewalls, intrusion detection/prevention systems, and antivirus software. They should also be exposed to coding languages like Python and tools for automating tasks.
9. **Cybersecurity Ethics:** Graduates must understand the ethical issues surrounding cybersecurity, such as responsible disclosure and the implications of hacking. Ethics courses should be integrated into undergraduate programs.
10. **Practical Experience:** Internships, co-op programs, and summer jobs provide opportunities for students to gain practical experience and develop their skills. These experiences are invaluable for graduates entering the cybersecurity industry.

In terms of the appropriateness of the level of study of the program, the program covers all the mandatory topics for a cybersecurity engineer. It also incorporates sustainability, materials, and design aspects into these core cybersecurity engineering courses.

5.2. General and specific program objectives

The purpose of the proposed program is to train cybersecurity engineers with valuable skills for a broad range of industrial, government, and non-profit sectors in Quebec and worldwide, who will close talent gaps and drive economic growth by ensuring the security of cyber systems, IOT systems, and critical infrastructures on which we build our modern digital and physical economy.

5.2.1. General Educational Objectives

- Apply technical knowledge in engineering, natural science, mathematics, and computer science to generate novel solutions to problems in industry and society, including the design or maintenance of information systems for various industries in our digital economy.
- Analyse processes and systems through a lens of system level security, dependability and equity to fully comprehend the economical and social impacts of various design decisions, and prioritize professional ethics and accountability in decision making.
- Earn an advanced degree or certification for the purpose of pursuing a career in academia or teaching, law, medicine, finance, research and development, or entrepreneurship; or become licensed as an

engineer.

- Propensity to continuously search for new knowledge, learn new skills, and become proficient in new and advanced engineering tools.

5.2.2. Specific Program Outcomes

By the end of the program, students should be able to:

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics and by using the appropriate engineering tools (Graduate Attributes 3.1.1, 3.1.2, 3.1.5)
- Design sustainable solutions that meet specified needs with consideration of all stakeholder views, public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors (Graduate Attributes 3.1.2, 3.1.4, 3.1.8, 3.1.9, 3.1.10, 3.1.11)
- Communicate complex engineering concepts or processes effectively in oral, written, and graphical forms with a range of audiences (Graduate Attributes 3.1.7)
- Contribute within a diverse team to complete an engineering design, while supporting a collaborative and inclusive environment, by generating ideas, setting design criteria, establishing project milestones and tasks, and performing lifecycle and economic analysis (Graduate Attributes 3.1.4, 3.1.5)
- Design and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions (Graduate Attributes 3.1.3, 3.1.4)
- Identify their own learning needs and update their skill sets to maintain competence and contribute to the advancement of knowledge (Graduate Attributes 3.1.12)
- Manage the design process through iterative idea generation, design criteria selection, project milestone and task scheduling, and lifecycle and economic analyses (Graduate Attributes 3.1.11)

6. REGULATORY FRAMEWORK

6.1. Admission Requirements and Processes

A summary of the admission requirements and processes at the GCS is given here; for further description of the admission requirements and processes for Concordia University please consult the following sections of the Undergraduate Calendar (UC): general admissions in Section 13³⁵; and GCS admissions in Section 71.10³⁶. The UC is available online.

6.1.1. General Admission Requirements

All applications to Concordia University go through a single processing center. Quebec applicants must: 1) successfully complete a two-year pre-university program in a CEGEP and qualify for a Diploma of Collegial Studies (DEC) or the equivalent, 2) have completed a three-year professional program in a CEGEP, or 3) have obtained a French or International Baccalaureate. Graduates from secondary schools in Canadian provinces and territories outside Quebec are considered for admission to the Extended Credit Program (ECP), which requires students to take 30 credits in addition to the regular program requirements. Transfers from other universities are possible. Applicants from outside of Canada are eligible, with further information available in Section 19 of UC³⁷. At the time of application, students can identify whether they would like to be considered for the co-operative education program.

The language of instruction at Concordia University is English, while most assignments and examinations may be submitted in French. Students whose first language is not English must demonstrate language proficiency prior to admission through achieving the appropriate score on one of five standardized English tests (Test of English as a Foreign Language, etc.) if they do not satisfy any of the exemption criteria.

6.1.2. Gina Cody School of Engineering and Computer Science (GCS) Admission Requirements for BEng

For Quebec applicants, there is a required CEGEP course profile of Mathematics 201 (103 or 201-NYA and 203 or 201-NYB and 105 or 201-NYC), Physics 203 (101 or 203-NYA and 201 or 203-NYB), and Chemistry 202 (101 or 202-NYA). As mentioned above, out-of-province applicants are considered for the ECP program if they do not have sufficient pre-university education (e.g., International Baccalaureate). As mentioned in the previous section, students in the ECP program must take 30 additional credits. The required courses are listed in Section 71.20.2 of the UC (a change request form should be submitted after APC approval of this dossier to add the program in in section 71.20.2). These courses consist of a foundation in mathematics (9 credits), physics (6 credits), and chemistry (3 credits), as well as some electives in natural science (6 credits), humanities and social sciences (6 credits). Mature entry admission requirements are available in Section 14 of the UC.

6.1.3. Cybersecurity Engineering Admission Requirements

Specific grade requirements for the program will be determined after the Curriculum Committee (defined in Section 6.3.1 of this document) evaluates the applications received, but are expected to be relatively in line with the grade requirements of the Software Engineering BEng³⁸, which are summarized below:

- Quebec CEGEP: 28 overall (R-score) and if taken, 26 in math, 25 in physics.
- High school: A- overall, A- in math, B+ in physics.
- Indigenous Bridging: First Nations, Inuit and Métis students who do not meet Concordia's conventional admission requirements may be eligible for admission through the Kaié:ri Nikawerà:ke Indigenous Bridging Program.

³⁵ <https://www.concordia.ca/academics/undergraduate/calendar/current/section-13-admission-regulations.html>

³⁶ <https://www.concordia.ca/academics/undergraduate/calendar/current/section-71-gina-cody-school-of-engineering-and-computer-science.html>

³⁷ <https://www.concordia.ca/academics/undergraduate/calendar/current/section-19-international-students.html>

³⁸ <https://www.concordia.ca/academics/undergraduate/software-engineering.html#requirements>

- International Baccalaureate: 33 overall, 5 HL or 6 SL math, 5 HL or SL physics.
- French Baccalaureate: 15 overall, 15 in math, 14 in science.
- British system of education (GCE):
 - A-levels: At least two A-level exams AB, B in math, B in physics; or
 - AS-levels: At least 4 AS-level exams with equivalent results; or
 - BTEC: Level 3 Diploma or Extended Diploma in a related subject area with equivalent results.
- University transfer (internal): 3.0 overall, 3.0 in math/physics, 2.3 in courses offered by GCS.
- University transfer (external): A- overall, B+ in math, B+ in physics.

6.2. Commitment and structure of the program

The program is 120 credits, with 39 courses, for full time studies with a duration of 4 years. Exceptions are the ECP described in the previous section, requiring 30 additional credits.

Mandatory credits (39 courses, 120):

1. Engineering Core Courses: 11 courses (30.5 credits)
 - a. Includes 1 General Education Elective Course (3 credits)
2. Cybersecurity Engineering Core Courses: 25 courses (80.5 credits)
 - a. Includes 1 Engineering and Natural Science Course (3 credits)
3. Technical Elective Courses: 3 courses (9 credits)

Eleven Engineering Core courses are required for a BEng by the GCS in Section 71.20.5 of the UC with 30.5 credits. ELEC 275 Principles of Electrical Engineering (3.5 credits) has been included in this program with the purpose of preparing students to take cyber physical and critical infrastructure security related courses later in the program.

For further information on the program structure, please refer to the student paths in Section 7.3.

The engineering and cybersecurity engineering core include courses which address:

- Science Knowledge: solid foundation in mathematics, physics, electrical and computer network systems.
- Professional Engineering Skills: communication, engineering practice, technology and society, and engineering economics
- Cybersecurity Engineering Fundamentals: cryptography, foundations for secure information systems, access control, security policies and security mechanisms, operating system security, network security, security vulnerabilities and malware defense, secure programming.
- Experiential learning: courses incorporating practice in theory.

The technical elective courses allow students to concentrate in the following subjects:

- Blockchain technology, cybersecurity ethics, cybercrime investigations, privacy.

Two optional activities, with no credit value, will supplement the proposed curriculum:

- **Internships through the Concordia Institute for Co-operative Education:** All students will have the opportunity to apply to be a member of the Institute and take part in their Undergraduate Co-op Program, Career Edge (C. Edge) Program, or Accelerated Career Experience (ACE) Program
- **Summer Internships:** Concordia research institutes (e.g., Concordia Security Research Centre) or industrial partners (e.g., Ericsson, Hydro-Québec) can provide research or industry internships. Some professors will also hire undergraduate interns via the Mitacs Accelerate program. NSERC Undergraduate Student Research Awards and Concordia Undergraduate Student Research Awards will also be offered to students who are interested in research focused internships.

6.3. Program oversight

6.3.1. Leadership and composition of the Program Committee

Section 7.1.3 mentions the accreditation procedures for engineering programs in Canada. It is expected by the 2023 Accreditation Criteria and Procedures³⁹ that program curriculum changes are overseen by a formally structured curriculum committee, and that the majority of the voting members of the committee are expected to be licensed to practice engineering in Canada.

For the proposed program, the Curriculum Committee will be led by an Undergraduate Program Director and consist of 6 members. The Associate Director of CISE, who is responsible for managing the master's level co-op program in the department will collaborate with the Institute for Co-operative Education to recommend admissions to the Institute, keep track of GPA adherence, and grade work term reports. This Associate Director will also have a spot on the Curriculum Committee to provide valuable feedback on student experiences during their work terms. The Curriculum Committee will be responsible for reviewing student feedback on courses, preparing documents for accreditation visits from the CEAB, making recommendations for program admissions, and proposing changes to the curriculum. Any aspects outside of curriculum management will be addressed by the Department Council under the advisement of the Undergraduate Program Director. The Concordia University Part-Time Faculty Association (CUPFA) will appoint a member to advise the Curriculum Committee.

The Undergraduate Program Director will receive half a course remission (1.5 credits) before the program starts. Each of the Undergraduate Program Director and Associate Director (Co-operative Education) will receive a full course remission each year when the program starts. This is part of the budget in Section 10 and in Appendix 11.

The first Curriculum Committee of the Cybersecurity Engineering BEng is proposed to be composed of:

- Prof. Chun Wang
- Prof. Yong Zeng
- Prof. Amr Youssef
- Prof. Lingyu Wang
- Prof. Mohammad Mannan
- Prof. Jeremy Clark
- Prof. Jun Yan
- Prof. Suryadipta Majumdar

The proposed committee satisfies the expectation that a majority of voting members are licensed engineers in Canada. Prof. Yan is pursuing licensure.

6.3.2. Study Regulations

Students enrolled in the proposed program will be subject to the Academic Regulations defined by the university (Section 16 of the UC) and by the GCS (Section 71.10.4 of the UC), both available online.

6.3.3. Collaborative Arrangements with other Units, Departments, Faculties, and Institutions

CISE is actively engaged with other departments, faculties, and research centers within the institution. All these established relationships will contribute to the vitality of the BEng. CISE professors regularly teach courses in the Departments of Electrical and Computer Engineering, Computer Science and Software Engineering at both undergraduate and graduate levels. For instance, Prof. Chadi Assi, Prof. Arash Mohammadi, Prof. Chun Wang, and Prof. Jun Yan teach offerings of COEN 231 Introduction to Discrete Mathematics. Prof. Glitho also teaches ENCS 691 in the Department of Computer Science and Software Engineering. Professor Amr Youssef and Mohammed Mannan also teach SOEN courses in the Department of Computer Science and Software Engineering. CISE professors also teach service

³⁹ https://engineerscanada.ca/sites/default/files/2023-12/Accreditation_Criteria_Procedures_2023.pdf

courses, valuable to the faculty as a whole. These include ENCS courses taught by Prof. Walter Lucia and Prof. Mohsen Ghafouri. We expect that our faculty members will continue to teach undergraduate level courses in other departments, especially those adopted in our new BEng. program.

Professor Mourad Debbabi is the director of the Security Research Centre, a multi-disciplinary center with 18 full members from six departments with diverse interests. The research center facilitates the interaction of security related researchers across departments, which will also provide critical resources in terms of teaching staff, research facilities, laboratories, and collaborations with industry partners.

CIISE is also developing a new inter-department MEng in Cyber-Physical and Critical Infrastructure Systems & Security with the Department of Electrical and Computer Engineering. Once approved, this program will provide the graduates of the BEng in cybersecurity with the option of continuing their studies at master's level.

Shared supervision of graduate students commonly occurs with the Department of Computer Science and Software Engineering (CSSE) and the Department of Electrical and Computer Engineering (ECE). CIISE professors also independently supervise students in other departments, including the above-mentioned departments, the Department of Building, Civil, and Environmental Engineering (BCEE), and Mechanical and Industrial Engineering.

7. PROGRAM STRUCTURE

7.1. Activities

7.1.1. *Mandatory and Optional Courses*

The proposed degree is a full-time program offering 39 courses, corresponding to 120 credits in total, which are allocated to five groups of courses:

- 49.5 credits (16 courses) from the Cybersecurity Engineering Core courses,
- 28 credits (8 courses) from the Cybersecurity Engineering Complementary Core courses,
- 30.5 credits (11 courses) from the Engineering Core Courses,
- 9 credits (3 courses) of Cybersecurity Engineering Electives,
- 3 credits (1 course) of Engineering and Natural Science Group: Cybersecurity Engineering

Table 7.1 provides a detailed list of the Cybersecurity Engineering Core; Table 7.2 Cybersecurity Engineering Complementary Core (28 credits, 8 courses) provides a list of Cybersecurity Engineering Complementary Core courses; Table 7.3 Engineering Core (30.5 credits, 11 courses) lists Engineering Core courses. The available Cybersecurity Engineering Elective courses are listed in Table 7.4. Cybersecurity Engineering Elective Courses (9 credits); Table 7.5. Engineering and Natural Science Group: Cybersecurity Engineering (3 credits) provides a list of courses belong to the Engineering and Natural Science Group: Cybersecurity Engineering. All the courses with INSE course codes are new courses proposed to be developed for the degree program. Some of the technical electives are cross listed with existing graduate level courses, which is indicated in Appendix 3.

Table 7.1 Cybersecurity Engineering Core courses (49.5 credits, 16 courses)

Courses	Credits
INSE 201 Security Ethics, Laws, Standards & Compliance	1.5
INSE 221 Cryptography I	3
INSE 321 Cryptography II	3
INSE 331 Database Security	3
INSE 349 Secure Programming and Software Design	3
INSE 351 Operating System Security	3
INSE 390 Cybersecurity Engineering Team Design Project	3
INSE 401 Usability and Human Aspects of Security	3
INSE 411 Privacy: Enhancing Technologies, Analysis and Measurement	3
INSE 412 Cybercrime and Digital Forensics	3
INSE 413 Security Auditing and Compliance	3
INSE 441 Mobile Application Security and Privacy	3
INSE 442 Reverse Engineering, Application and Malware Analysis	3
INSE 445 Network Security	3
INSE 452 Penetration Testing and Ethical Hacking	3
INSE 490 Capstone Cybersecurity Engineering Design Project	6

Table 7.2 Cybersecurity Engineering Complementary Core (28 credits, 8 courses)

Courses	Credits
COMP 232 Mathematics for Computer Science	3
COMP 248 Object-Oriented Programming I	3.5
COMP 249 Object-Oriented Programming II	3.5

SOEN 228 System Hardware	4
COMP 346 Operating Systems	4
COMP 348 Principles of Programming Languages	3
COMP 352 Data Structures and Algorithms	3
COMP 445 Communication Networks and Protocols	4

Table 7.3 Engineering Core (30.5 credits, 11 courses)

Courses	Credits
ENGR 201 Professional Practice and Responsibility	1.5
ENGR 202 Sustainable Development and Environmental Stewardship	1.5
ENGR 213 Applied Ordinary Differential Equations	3
ENGR 233 Applied Advanced Calculus	3
ENGR 301 Engineering Management Principles & Economics	3
ENGR 371 Probability and Statistics in Engineering	3
ENGR 391 Numerical Methods in Engineering	3
ENGR 392 Impact of Technology on Society	3
ELEC 275 Principles of Electrical Engineering	3.5
ENCS 282 Technical Writing and Communication	3
XXXX XXX General Education Elective	3

Table 7.4. Cybersecurity Engineering Elective Courses (9 credits)

Courses	Credits
INSE 481 Blockchain Technologies and Applications	3.0
INSE 482 Industrial Control Systems and Critical Infrastructure Security	3.0
INSE 483 IoT and Embedded System Security	3.0
INSE 484 Quantum Computing and Security	3.0
INSE 485 Cybersecurity of Healthcare Systems and Devices	3.0
INSE 486 Cybersecurity Management and Governance	3.0
INSE 498 Topics in Cybersecurity Engineering	3.0

Table 7.5. Engineering and Natural Science Group: Cybersecurity Engineering (3 credits)

Courses	Credits
ENGR 245 Mechanical Analysis	3.0
MIAE 221 Materials Science	3.0

7.1.2. Description Activities and Evaluation Methods

Table 7.6 provides the mapping between the learning outcomes and learning activities included in the proposed program:

- **Coursework:** Thirty-nine (39) courses develop the knowledge required for the bachelor's in cybersecurity engineering. The courses favour a blended learning format and include, whenever possible, in-class work and discussions solving practical problems, and teamwork (projects & presentations). Experts from the industry may be invited to present specific topics.
- **Laboratories:** Our cybersecurity laboratory component is a critical aspect of our program, providing students

with hands-on experience in the field of cybersecurity. Through the use of advanced tools, students will engage in lab simulations and practical projects that simulate real-world cybersecurity challenges. The labs will reinforce key concepts covered in the core courses and will emphasize the practical application of theoretical knowledge. Students will develop essential skills in areas such as network security, cryptography, digital forensics, ethical hacking, malware analysis, secure software development, and cloud security. This practical experience will be invaluable in preparing students for the dynamic and ever-changing field of cybersecurity. Upon graduation, students will be well-equipped to enter the workforce and contribute to the defense of information systems and networks against cyber threats.

- **Capstone Project:** One (1) two-semester capstone design project course will provide students the opportunity to work with industrial partners, other departments, or research organizations to solve a real problem. In addition, courses will favour projects rather than assignments to put into practice the concepts learned and promote teamwork.
- **Special activities:** During the summer, students can engage in special activities to earn industry certification, gain work experience, or work in research in one of Concordia’s research centres.

For more information about the course evaluation methods, please refer to the course outlines in Appendix 3.

Table 7.6. Mapping of the Program Requirements with Learning Outcomes.

Learning Outcomes	Learning Activities					Assessment Methods
	Lectures and readings	Labs	Fixed answer problem sets	Course Embedded Projects	Design and Capstone project	
Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics and by using the appropriate engineering tools	✓	✓	✓	✓	✓	<ul style="list-style-type: none"> - Project presentation - Project report - Fixed-answer problem sets - Multiple choice questions - Long answer questions - Lab reports - Simulations
Design cybersecurity solutions that meet specified needs with consideration of all stakeholder views, public safety, and welfare, as well as global, cultural, social, and economic factors	✓	✓	✓		✓	<ul style="list-style-type: none"> - Project presentations - Project reports - Poster presentations - Long answer questions - Case studies
Communicate complex engineering concepts or processes effectively in oral, written and graphical forms with a range of audiences		✓	✓	✓	✓	<ul style="list-style-type: none"> - Project presentations - Project reports - Poster presentations - Lab reports - Concept maps

Contribute within a diverse team to complete an engineering design, while supporting a collaborative and inclusive environment	✓		✓		✓	<ul style="list-style-type: none"> - Group project presentations - Group project reports - Project plan deliverable - Long answer questions - Peer evaluation
Design and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions		✓	✓		✓	<ul style="list-style-type: none"> - Pre-lab quizzes - Lab reports - Long answer questions - Multiple choice questions - Fixed-answer problem sets - Project reports
Identify their own learning needs and update their skill sets to maintain competence and contribute to the advancement of knowledge		✓	✓		✓	<ul style="list-style-type: none"> - Learning journals - Self-reflective paper - Forum discussions - Project deliverables - Project reports - Lab reports
Manage the design process through iterative idea generation, design criteria selection, project milestone and task scheduling, and lifecycle and economic analyses	✓		✓	✓	✓	<ul style="list-style-type: none"> - Project plan - Project report - Project presentation - Long-answer questions - Fixed-answer problem sets

7.1.3. Accreditation Activities

After the first class of students graduating from the BEng program, this program will be eligible for accreditation by Engineers Canada. The first accreditation visit may be scheduled in the final year of the first graduating class, in October or November. Currently, accreditation visits are conducted following the 2023 Accreditation Criteria and Procedures. Part of the accreditation process involves the assessment of the Graduate Attributes, which were introduced in section 3.1 of this document. Another important part is the assessment of the curriculum content and quality, measured by Accreditation Units (AUs). AUs are defined on an hourly basis depending on the learning activity (1 AU for lecture hour, 0.5 AU for laboratory or tutorial hour, for 50 minutes of total activity). The minimum curriculum components for an engineering program are given in Table 7.7, along with the AUs in the provided program (assuming the students come in with the listed AUs from CEGEP). Note that the AU calculations are done without considering the three technical electives, indicating that the minimum path, regardless of the technical elective courses that students choose, meets accreditation requirements. Thus, AUs of the technical electives proposed are not required to be calculated and are not included in the graduate attribute mapping.

Table 7.7. Required AUs by the 2023 Accreditation Criteria and Procedures by Engineers Canada and Calculated AUs for the proposed BEng in Cybersecurity Engineering

Components	Minimum # of AUs required		# of AUs from CEGEP		# of AUs from the proposed program		Total # of AUs for the proposed program and CEGEP	
Mathematics	195	420	108	288	213.2	402.0	325.2	690.0
Natural Sciences	195		180		188.8		300.8	
Engineering Science	225	900**	0	0	644.0	969.9	644.0	969.9
Engineering Design	225*		0		325.9		325.9	
Complementary Studies	225		72		209.1		281.1	
Overall total	1850		360		1581		1941	

*Must be delivered by faculty members holding professional licensure as specified in the Interpretive statement on licensure expectations and requirements

**600 must be delivered by faculty members holding, or progressing toward, professional licensure as specified in the Interpretive statement on licensure expectations and requirements

‡ AUs have been calculated based on a 12-week semester, which is adopted by Concordia since 2023-24.

7.2. Pedagogical approaches

7.2.1. Combined theoretical and practical training

All the courses in the degree program will have in-person lectures discussing the relevant theory. In these lectures, the theoretical principles underlying the core cybersecurity engineering concepts will be discussed in detail. The application of these principles will be demonstrated through problem-solving. Problem-solving skills will be further developed by problem-set assignments.

To bridge the gap between theory and practice, many of the core courses in the degree program will have a project component in which students will apply their theoretical knowledge to solve industrially relevant problems. These projects will be carried out in teams to foster teamwork and collaboration, and to enhance the communication and leadership skills of the students. Students will be responsible for identifying a critical need/problem in the industry or a societal need in applicable courses. They will conduct appropriate experimentation/analysis and draw conclusions using their engineering judgment. Students will present and discuss their findings and participate in evaluating the work of other teams.

7.2.2. Hands-on laboratory training

Hands-on laboratory training is a key component of our undergraduate cybersecurity program, providing students with practical experience in applying theoretical concepts to real-world cybersecurity scenarios. Our laboratory sessions are designed to reinforce key concepts covered in the core courses and will emphasize problem-solving and achieving specific objectives. Students will have access to advanced equipment and tools and will engage in virtual lab simulations to prepare for the physical lab.

Through our laboratory sessions, students will develop essential skills in areas such as network security, cryptography, digital forensics, ethical hacking, malware analysis, secure software development, and cloud security. We also incorporate emerging technologies and trends into our lab sessions to ensure that our students are up to date with the latest advancements in cybersecurity.

Our hands-on laboratory training is led by not only cybersecurity faculty members but also experienced professionals

who bring industry expertise and real-world experience to the classroom. This practical experience will be invaluable in preparing students for the dynamic and ever-changing field of cybersecurity. Upon graduation, students will have the practical skills and knowledge necessary to enter the workforce and contribute to the defense of information systems and networks against cyber threats.

7.2.3. *Innovation in Teaching and Learning*

Innovation in teaching and learning is crucial for our cybersecurity program, given the rapidly changing landscape of cybersecurity threats and technologies. We are committed to providing our students with cutting-edge education that prepares them to address the latest cybersecurity challenges. To achieve this goal, we have implemented various innovative teaching and learning strategies such as project-based learning, flipped classrooms, and simulations. These strategies are designed to engage students actively, promote critical thinking, and enhance problem-solving skills. Our program also utilizes online resources, open educational resources, and multimedia tools to enhance student learning and accessibility. Additionally, we provide students with opportunities to participate in cybersecurity competitions, hackathons, and internships to apply their skills and knowledge to real-world scenarios. By utilizing innovative teaching and learning strategies, we aim to produce cybersecurity professionals who are well-equipped to address the ever-changing cybersecurity landscape.

7.2.4. *Pedagogical approaches in capstone course*

The capstone course is a design-focused and project-based course students will take in the last two terms of the degree program. The course learning outcomes, learning activities, evaluation methods and deliverables have been designed to allow students to further develop and demonstrate achievement (at the application level) of all 12 graduate attributes.

The capstone project requires students to work in groups to define a design problem, conduct research, design, and plan the implementation of a cybersecurity solution. Similar to other BEng Capstone design projects at the Gina Cody School, the pedagogical methods used for this course draw on problem-based learning, collaborative learning, and reflective learning. Students will be evaluated with a midterm report, a progress poster, a final report and a final presentation. These deliverables, along with transparent evaluation criteria/rubrics, aim to enhance students' ability to solve open-ended design problems, improve teamwork skills, communicate processes and solutions in written, oral and visual forms, and identify needs for further learning. Further information can be found in the course outline for INSE 490 in Appendix 3.

7.2.5. *Work-Integrated learning*

Concordia University offers a variety of structured work-integrated learning programs through the Institute for Co-operative Education. Work-integrated learning is a model of experiential learning that bridges the academic program and the world of work. Among the different modalities offered, the Co-op program is the longest-standing and the most popular. Students admitted to the Co-op program will alternate between study terms and three internships with three different employers. The program integrates academic studies with program-relevant work experiences in a progressive manner, giving students the opportunity to transfer knowledge and skills between work and classroom settings.

Students can apply to Co-op by completing the appropriate section on the University Admission form. Admission to the program is based on academic performance and a few other factors. Students can also apply to Co-op after being enrolled in the program as long as they have a minimum of 90 credits remaining.

All eight existing BEng programs at Concordia offer Co-op options. Two of those programs (Electrical Engineering and Computer Engineering) also added another modality of work-integrated learning called C-Edge (Career Edge) as a mandatory part of the curriculum. All students who are not enrolled in the Co-op program must complete one 12- to 17-week paid internship to graduate. This ensures every student in the program an opportunity for experiential learning in a real-world context.

Capitalizing on other BEng programs' experience in incorporating work-integrated learning in the curriculum, the proposed BEng in Cybersecurity Engineering will also open the Co-op and the C-Edge programs to its students. Both programs will be optional upon the launch of the new program, but a clear pathway and ample support will be provided to students enrolled in those programs. There is a possibility of making C-Edge (one internship) mandatory a few years down the road when enrollments are steady and connections with employers are well established.

Other Experiential Learning (EL) Opportunities

Like students enrolled in any other program at Concordia University, students in the proposed new program will benefit from the following experiential learning and professional development offerings provided by the university to expand their hands-on and professional learning opportunities.

Concordia offers six types of experiential learning opportunities: course-integrated, work-integrated, research-based, community-based, international, and student life. Students can search for EL opportunities to participate in by faculty, program, or by type. Career counselors are available to help students explore how different experiential learning opportunities complement different career pathways or their particular career goals. In addition, a personal EL roadmap tool is available to all students, which helps students plan to integrate experiential learning activities into their studies throughout the program.

Concordia has also partnered with Riipen, the world's leading virtual project-based learning platform that connects students with industry and community partners to complete real-world projects for academic credit. Faculty can use Riipen to find real-world projects to use as course assignments and track student progress in real time.

Free professional development courses

Concordia provides students as well as faculty and staff access to more than 4000 free online courses from Udemy covering virtually all disciplines. Cybersecurity Engineering students can find courses that help them solidify prerequisite knowledge, enhance their current studies within the curriculum, and build professional skills as cybersecurity engineers.

7.3. Typical student path and Course Sequences

The proposed degree is a full-time, 4-year program with an optional co-op stream. Table 7.8 below shows a sample program pathway for students enrolled in the co-op program with a September entry.

Table 7.8. Study/Work Sequence for the Co-op Program (September Entry)

Year	Summer	Fall	Winter
1		Study	Study
2	Study	Work 1	Study
3	Study	Study	Work 2
4	Work 3	Study (Capstone)	Study (Capstone)

The core courses in cybersecurity engineering will be offered in all three semesters (Fall, Winter, Summer) to accommodate the needs of students in both the regular and the co-op programs. For a detailed mapping of all courses to academic semesters for regular and co-op and students, see the pathways and course sequences provided in the following pages for September Entry - Regular, and September Entry – Co-op.

Proportion of practical versus theoretical activities

The proportion of practical versus theoretical activities is 37% practical versus 63% theoretical. The practical activities correspond to the tutorial and laboratory hours given in same. There is a large proportion of practical activities compared to theoretical activities, showing that the program has a strong experiential learning component. Note that this does not include the optional experiential learning opportunities such as the Co-op program, E-Edge, or ACE.

Table 7.9 Typical Course Sequence (September Entry – Regular- Year 1&2)

Year 1		Year 2	
Fall	Winter	Fall	Winter
ENGR 213 Applied Ordinary Differential Equations (3) pre: MATH 205; co: MATH 204	ENGR 233 Applied Advanced Calculus (3) pre: MATH 204, 205	ENGR 201 Professional Practice and Responsibility (1.5)	ENGR 202 Sustainable Development & Environmental Stewardship (1.5)
INSE 201 Security Ethics, Laws, Standards & Compliance (1.5)	General Elective Course 1 (3)	INSE 321 Cryptography II (3) pre: INSE 221	ENGR 371 Probability and Statistics in Engineering (3) pre: ENGR 213, 233
COMP 232 Mathematics for Computer Science (3) pre: MATH 203, 204	INSE 221 Cryptography I (3) pre: COMP 232 or COEN 231	COMP 348 Principles of Programming Languages (3) pre: COMP 249	COMP 346 Operating Systems (4) pre: COMP/SOEN 228; COMP 352
COMP 248 Object-Oriented Programming I (3.5) pre: MATH 204	COMP 249 Object-Oriented Programming II (3.5) pre: COMP 248; MATH 203, 205	COMP 352 Data Structures and Algorithms (3) pre: COMP 232, 249	INSE 349 Secure Programming and Software Design (3) pre: INSE 221
ELEC 275 Principles of Electrical Engineering (3.5) pre: PHYS 205; co-req: ENGR 213	Engineering and Natural Science Group: Cybersecurity Engineering Course 1 (3)	SOEN 228 System Hardware (4) pre: MATH 203, 204	ENCS 282 Technical Writing and Communication (3) pre: EWT/ENCS 272
Fall: 14.5 credits	Winter: 15.5 credits	Fall: 14.5 credits	Winter: 14.5 credits
Year 1: 30 credits		Year 2: 29 credits	

Table 7.10 Typical Course Sequence (September Entry – Regular- Year 3&4)

Year 3		Year 4	
Fall	Winter	Fall	Winter
ENGR 391 Numerical Methods in Engineering (3) pre: ENGR 213, 233; COMP 248/COEN 243	INSE 390 Cybersecurity Engineering Team Design Project (3) pre: ENCS 282; INSE 331, 351, ENGR 371 co-req: INSE 445	ENGR 301 Engineering Management Principles & Economics (3)	ENGR 392 Impact of Technology on Society (3) pre: ENCS 282; ENGR 201, ENGR 202
INSE 331 Database Security (3) pre: INSE 349; COMP/COEN 352	INSE 411 Privacy: Enhancing Technologies, Analysis and Measurement (3) pre: INSE 401	INSE 441 Mobile Application Security and Privacy (3) pre: INSE 349, 445	INSE 452 Penetration Testing and Ethical Hacking (3) pre: INSE 442, 445
INSE 351 Operating System Security (3) pre: INSE 349; COMP/COEN 346	INSE 445 Network Security (3) pre: INSE 321, 349; COMP 445 or ELEC/COEN 366	INSE 412 Cybercrime & Digital Forensics (3) pre : INSE 401, 442	Cybersecurity Engineering Elective Course 2 (3)
COMP 445 Data Communication and Computer Networks (4) pre: COMP 346	INSE 442 Reverse Engineering, Application and Malware Analysis (3) pre: INSE 331, 351	Cybersecurity Engineering Elective Course 1 (3)	Cybersecurity Engineering Elective Course 3 (3)
INSE 401 Usability and Human Aspects of Security (3) pre: INSE 321	INSE 413 Security Auditing and Compliance (3) pre: INSE 331, 351 co-req: INSE 445	INSE 490 Capstone Cybersecurity Engineering Design Project (6) pre: INSE 390; ENGR 301, 391	
Fall: 16 credits	Winter: 15 credits	Fall: 15 credits	Winter: 15 credits
Year 3: 31 credits		Year 4: 30 credits	

Table 7.11 Typical Course Sequence (September Entry - Co-op - Year 1&2)

Year 1			Year 2		
Summer	Fall	Winter	Summer	Fall	Winter
	ENGR 213 Applied Ordinary Differential Equations (3) pre: MATH 205; co: MATH 204	ENGR 233 Applied Advanced Calculus (3) pre: MATH 204, 205	ENGR 201 Professional Practice and Responsibility (1.5)	Work Term 1	ENGR 202 Sustainable Development & Environmental Stewardship (1.5)
	INSE 201 Security Ethics, Laws, Standards & Compliance (1.5)	General Elective Course 1 (3)	INSE 321 Cryptography II (3) pre: INSE 221		ENGR 371 Probability and Statistics in Engineering (3) pre: ENGR 213, 233
	COMP 232 Mathematics for Computer Science (3) pre: MATH 203, 204	INSE 221 Cryptography I (3) pre: COMP 232 or COEN 231	COMP 348 Principles of Programming Languages (3) pre: COMP 249		COMP 346 Operating Systems (4) pre: COMP/SOEN 228; COMP 352
	COMP 248 Object-Oriented Programming I (3.5) pre: MATH 204	COMP 249 Object-Oriented Programming II (3.5) pre: COMP 248; MATH 203, 205	COMP 352 Data Structures and Algorithms (3) pre: COMP 232, 249		INSE 349 Secure Programming and Software Design (3) pre: INSE 221
	ELEC 275 Principles of Electrical Engineering (3.5) pre: PHYS 205; co- req: ENGR 213	Engineering and Natural Science Group: Cybersecurity Engineering Course 1 (3)	SOEN 228 System Hardware (4) pre: MATH 203, 204		ENCS 282 Technical Writing and Communication (3) pre: EWT/ENCS 272
	Fall: 14.5 credits	Winter: 15.5 credits	Fall: 14.5 credits		Winter: 14.5 credits
Year 1: 30 credits			Year 2: 29 credits		

Table 7.12 Typical Course Sequence (September Entry - Co-op - Year 3&4)

Year 3			Year 4		
Summer	Fall	Winter	Summer	Fall	Winter
ENGR 391 Numerical Methods in Engineering (3) pre: ENGR 213, 233; COMP 248/COEN 243	INSE 390 Cybersecurity Engineering Team Design Project (3) pre: ENCS 282; INSE 331, 351; ENGR 371 co-req: INSE 445	Work Term 2	Work Term 3	ENGR 301 Engineering Management Principles & Economics (3)	ENGR 392 Impact of Technology on Society (3) pre: ENCS 282; ENGR 201, ENGR 202
INSE 331 Database Security (3) pre: INSE 349; COMP/COEN 352	INSE 411 Privacy: Enhancing Technologies, Analysis and Measurement (3) pre: INSE 401			INSE 441 Mobile Application Security and Privacy (3) pre: INSE 349, 445	INSE 452 Penetration Testing and Ethical Hacking (3) pre: INSE 442, 445
INSE 351 Operating System Security (3) pre: INSE 349; COMP/COEN 346	INSE 445 Network Security (3) pre: INSE 321, 349; COMP 445 or ELEC/COEN 366			INSE 412 Cybercrime & Digital Forensics (3) pre : INSE 401, 442	Cybersecurity Engineering Elective Course 2 (3)
COMP 445 Data Communication and Computer Networks (4) pre: COMP 346	INSE 442 Reverse Engineering, Application and Malware Analysis (3) pre: INSE 331, 351			Cybersecurity Engineering Elective Course 1 (3)	Cybersecurity Engineering Elective Course 3 (3)
INSE 401 Usability and Human Aspects of Security (3) pre: INSE 321	INSE 413 Security Auditing and Compliance (3) pre: INSE 331, 351 co-req: INSE 445			INSE 490 Capstone Cybersecurity Engineering Design Project (6) pre: INSE 390; ENGR 301, 391	
Fall: 16 credits	Winter: 15 credits			Fall: 15 credits	Winter: 15 credits
Year 3: 31 credits			Year 4: 30 credits		

Table 7.13. Course sequence and full load offering for all entries.

COURSE	TITLE	CREDIT	PRE-REQ	CO-REQ	SUM 1	SUM 2	FALL	WIN
COMP 232	Mathematics for Computer Science	3.0	MATH 203, 204				X	X
COMP 248	Object-Oriented Programming I	3.5	MATH 204				X	X
COMP 249	Object-Oriented Programming II	3.5	COMP 248; MATH 203, 205				X	X
COMP 346	Operating Systems	4.0	COMP/SOEN 228; COMP 352		X		X	X
COMP 348	Principles of Programming Languages	3.0	COMP 249		X		X	X
COMP 352	Data Structures and Algorithms	3.0	COMP 232, 249		X		X	X
COMP 445	Data Communication & Computer Networks	4.0	COMP 346		X		X	X
SOEN 228	System Hardware	4.0	MATH 203, 204				X	X
ELEC 275	Principles of Electrical Engineering	3.5	PHYS 205	ENGR 213			X	X
ENCS 282	Technical Writing and Communication	3.0	EW/ENCS 272		X	X	X	X
ENGR 201	Professional Practice and Responsibility	1.5			X		X	X
ENGR 202	Sustainable Development & Environmental Stewardship	1.5			X	X	X	X
ENGR 213	Applied Ordinary Differential Equations	3.0	MATH 205	MATH 204	X		X	X
ENGR 233	Applied Advanced Calculus	3.0	MATH 204, 205		X	X	X	X
ENGR 301	Engineering Management Principles & Economics	3.0			X	X	X	X
ENGR 371	Probability and Statistics in Engineering	3.0	ENGR 213, 233		X	X	X	X
ENGR 391	Numerical Methods in Engineering	3.0	ENGR 213, 233; COMP 248/COEN 243			X	X	X
ENGR 392	Impact of Technology on Society	3.0	ENCS 282; ENGR 201, ENGR 202		X	X	X	X
GEN. ED.	General Education Elective	3.0	See section 71.110 of the Undergraduate Calendar		X	X	X	X
INSE 201	Security Ethics, Laws, Standards & Compliance	1.5				X	X	X
INSE 221	Cryptography I	3.0	COMP 232/COEN 231		X		X	X
INSE 321	Cryptography II	3.0	INSE 221				X	X
INSE 331	Database Security	3.0	INSE 349; COMP/COEN 352				X	X
INSE 349	Secure Programming and Software Design	3.0	INSE 221				X	X
INSE 351	Operating System security	3.0	INSE 349; COMP/COEN 346				X	X
INSE 390	Cybersecurity Engineering Team Design Project	3.0	ENCS 282, ENGR 371 INSE 331, 351	INSE 445			X	X
INSE 401	Usability and Human Aspects of Security	3.0	INSE 321				X	X
INSE 411	Privacy: Enhancing Technologies, Analysis and Measurement	3.0	INSE 401				X	X
INSE 412	Cybercrime & Digital Forensics	3.0	INSE 401, 442				X	X
INSE 413	Security Auditing and Compliance	3.0	INSE 331, 351	INSE 445			X	X
INSE 441	Mobile Application Security and Privacy	3.0	INSE 349, 445				X	X
INSE 442	Reverse Engineering, Application and Malware Analysis	3.0	INSE 331, 351				X	X
INSE 445	Network Security	3.0	INSE 321, 349; COMP 445 or ELEC/COEN 366				X	X
INSE 452	Penetration Testing and Ethical Hacking	3.0	INSE 442, 445				X	X
INSE 481	Blockchain Technologies & Applications	3.0						X
INSE 482	Industrial Control Systems & Critical Infrastructure Security	3.0						X
INSE 483	IoT and Embedded System Security	3.0						X
INSE 484	Quantum Computing & Security	3.0						X
INSE 485	Cybersecurity of Healthcare Systems and Devices	3.0						X
INSE 486	Cybersecurity Management & Governance	3.0						X
INSE 490	Capstone Cybersecurity Engineering Design Project	6.0	INSE 390, ENGR 301, ENGR 391				X	X
INSE 498	Topics in Cybersecurity Engineering	3.0						X

7.4. Feedback and evaluation

A description of the feedback and evaluation of the co-operative education program is given in Section 7.4.1. There is no research component of the program.

7.4.1. Feedback and Evaluation Processes for the Co-operative Format

The Institute for Co-operative Education offers a number of work-integrated learning opportunities to students in the GCS. Work-integrated learning is a model of experiential learning that bridges the academic program and the world of work. It provides students with the opportunity to combine study with paid work terms in their chosen fields.

The academic content is identical to that of the regular programs with three work terms interspersed with study terms. However, in order to continue their studies in the co-operative format in the GCS, or to graduate from one of its programs as members of the Institute for Co-operative Education, students must satisfy the following conditions:

- i. must be in acceptable standing and maintain a cumulative grade point average (CGPA) of at least 2.50 in their program (the CGPA is calculated in the manner described in Section 16.3.10 Academic Performance under [Section 16.3 Evaluation, Administrative Notations, Examinations, and Performance Requirements](#));
- ii. be assigned a grade of pass for each of the three work-term courses (CWTE or CWTC). Under certain conditions, students may be placed on co-op probation status;
- iii. remain in their designated work study sequence. Any deviations must have prior approval by the director of the Institute for Co-operative Education in consultation with the co-op program director in their department.

Regulations for Work Terms

- Successful completion of the work terms shown in the Co-op Schedule indicated in [Section 24 Institute for Co-operative Education](#) is a prerequisite for graduation as a member of the Institute for Co-operative Education.
- Work-term job descriptions are screened by the co-op coordinator. Only jobs approved by the Institute for Co-operative Education will be accepted as being suitable for the work-term requirements.
- Work-term jobs are full-time employment normally for a minimum of 12 consecutive weeks (14 to 16 weeks, preferably).
- A work-term report must be submitted each work term on a subject related to the student's employment. This report must be submitted to the Institute for Co-operative Education on or before the deadline shown in [Section 24 Institute for Co-operative Education](#). Grammar and content of work-term reports are evaluated by the Institute for Co-operative Education and the technical aspects are evaluated by the co-op program director responsible. Evidence of the student's ability to gather material relating to the job, analyze it effectively, and present it in a clear, logical, and concise form is required in the report.
- The required communication component consists of an oral presentation on a technical subject or engineering task taken from the student's work environment. The presentation will be given on campus in a formal setting after students have returned to their study term. A written summary is also required. Guidelines for the preparation of this oral presentation are provided in the Co-op Student Handbook.
- Work terms will be evaluated for satisfactory completion. Assessment is based upon the employer evaluation of performance, the work-term report, graded by the Academic Director, and communication component which together constitute the job performance as related to the whole work term. Students must pass all required components. The grade of pass or fail will be assigned to each of the work-term courses. A failing grade will result in the student's withdrawal from the Institute for Co-operative Education.

Student Demand and Enrolment

All students will be able to apply for the Co-op program. Those who are not admitted to the Co-op program can enroll in the Career Edge program. Every student who wishes to have an internship will have the opportunity to enroll in the Career Edge program. Please refer to the Letter of Support provided by the Institute for Co-operative Education provided in Appendix 6.

7.5. Alignment of activities, skills and program objectives

Engineering education in Canada is overseen by Engineers Canada. The necessary skills and attributes required of graduating students are well-documented to ensure that graduates are achieving the appropriate standard of education to start careers in their selected domains. To this end, 12 graduate attributes are defined that must be addressed by the proposed curriculum. Aligned with these attributes, the courses proposed for the undergraduate cybersecurity engineering program are linked to these attributes and the level at which the attribute is learned or demonstrated (introduce, develop, apply) in a particular course. Detailed graduate attributes mapping tables can be found in Appendix 3A.

Specific knowledge, expertise, skills (learning outcomes) which students will acquire

By the end of this program, successful students will be able to do the following:

Knowledge

1. Understanding of sciences related to cybersecurity engineering:
 - Mathematics
 - Computer science
 - Computer engineering
 - Electrical engineering
 - Software engineering
2. Understanding of the fundamentals of cybersecurity engineering:
 - Threat modeling
 - Security architecture
 - Cryptography
 - Access control
 - Risk management
 - Incident response
 - Secure software development
 - Network security
 - Identity and access management
 - Physical security
 - Cybersecurity engineering tools
3. Understand the engineering profession:
 - Code of ethics
 - Impact on society of engineering projects and technology
 - Rules and regulations

Skills & Abilities

1. Soft skills/abilities
 - Critical thinking (structured analysis, research literature, evaluation, conclusion)
 - Problem-solving (problem definition, brainstorming, planning, evaluation)
 - Communication skills (written, oral, active listening, presentation)
 - Teamwork (planning and organization, conflict resolution)
2. Technical Skills/abilities
 - Knowledge of operating systems (Windows, Linux, etc.) and associated security features

- Experience with networking concepts, protocols, and security controls
- Understanding of programming languages and software development processes
- Knowledge of cryptography and encryption technologies
- Familiarity with web application security and associated protocols (HTTP, HTTPS, etc.)
- Ability to perform vulnerability assessments and penetration testing
- Experience with intrusion detection and prevention systems
- Familiarity with security information and event management (SIEM) systems
- Knowledge of cloud computing security principles and technologies
- Familiarity with mobile device security and mobile application development processes
- Understanding of incident response processes and procedures
- Knowledge of regulatory compliance standards and frameworks (PCI-DSS, HIPAA, etc.)
- Familiarity with virtualization and containerization technologies

8. SUPPORT FOR STUDENT SUCCESS

8.1. Financial support

There are various sources of funding available to support the students. Below is a list of applicable financial support programs to the BEng in Cybersecurity Engineering students.

University-wide sources of funding:

- Concordia Council on Student Life Special Project Funding
- Concordia University Small Grants Program
- Concordia University Alumni Association (CUAA)
- Concordia Student Union (CSU)
- Grants for Religious and Spiritual Groups
- QPIRG Discretionary Fund
- Sustainability Action Fund
- SHIFT Centre for Social Transformation
- Concordia University Undergraduate Entrance Bursary Program
- Concordia University Undergraduate In-Course Bursary program
- Brian T. Counihan Scholarship for Outstanding Contribution to Student Life
- Colors of Concordia Award
- Dr. Dimitri Elia Bitar Scholarships
- Garnet Key Entrance Award
- Lambda Scholarship Tuition Award
- Leadership in Environmental Sustainability Shuffle Award
- Leonard J. Bocarro Science, Engineering and Technology Scholarship
- Loyola Foundation Inc. Entrance Scholarship
- NSERC USRA Competition
- Pierre-Peladeau Bourses
- Queen of Angels Academy Foundation Memorial Award
- Susan Levin Woods Scholarship
- Concordia Presidential Scholarship
- Concordia International Scholars
- Student Mobility Program
- Concordia Undergraduate Student Research Awards Program
- External Awards

Gina Cody School of Engineering and Computer Science (GCS) sources of funding:

For all students:

- Fariborz and Roya Haghighat Entrance Scholarship in Engineering (\$5,000 value)
- Gina Cody Undergraduate Entrance Scholarship in Engineering and Computer Science (\$5,000 value)
- Marie and Bob Baird Entrance Scholarship (\$5,000 value)
- Petrogiannis Family Award for Women in Engineering (\$5,000 value)
- Concordia University Shuffle Entrance Scholarship (\$3,000 value)
- Bachelor of Engineering 50th Anniversary Scholarship (\$2,500 value)
- Concordia University Entrance Scholarship (\$2,500 value)
- Concordia University Adopt-A-Student Entrance Scholarship
- Gina Cody School Shuffle Scholarship (\$1,661.66 value)
- Carolina Gallo Scholarship for Women in Engineering and Computer Science (\$1,000 value)

- ENCS Student Life Award (\$1,000 value)

For International students:

- Concordia University International Tuition Entrance Scholarship (\$5,000 value)

For Canadian citizens and permanent residents:

- Normand D. Hébert Scholarship in Engineering (\$7,000 value)
- NDT Technologies Inc. Scholarship for Engineering and Computer Science (\$5,000 value)
- Robert Walsh Entrance Scholarship in Engineering and Computer Science (\$5,000 value)
- Gina Cody School Women in Engineering Entrance Scholarships (\$2,500 value)
- Concordia University Alumni Association Entrance Scholarship (\$2,000 value)
- Jack Bordan Entrance Scholarship in Engineering and Computer Science (\$2,000 value)
- Concordia University Memorial Endowment Entrance Scholarship (\$1,250 value)
- Schouela Family Entrance Scholarship (\$1,250 value)

For Canadian citizens with Quebec resident status

- Distinguished CEGEP Entrance Scholarship in Engineering and Computer Science (\$5,000 value)

For Quebec students

- Gina Cody School Undergraduate Entrance Scholarship (\$3,000 value)

8.2. Student Services

There are a variety of student services, workshops, and events offered by various offices in Concordia, the Concordia Institute for Information Systems Engineering, and various Student Associations. Below is a non-exhaustive list of these services:

- Admission advising
- Immigration advising
- Academic advising & support
- Financial support
- Health & well-being
- Career & job resources
- Student life
- Student Emergency and Food Fund
- CIISE Undergraduate Orientation Session
- CIISE Gala Event
- CIISE Undergraduate Research Day
- CIISE Undergraduate Student Handbook
- CIISE Workshops
- CIISE Annual BBQ Event
- CIISE Seminar Series
- Student Association Events
- Capstone Poster Day

Related Offices:

- Student Academic Services (SAS)
- International Students Office (ISO)
- Student Success Centre
- Financial Aid and Awards Office
- Health Services
- Campus Security
- Access Centre for Students with Disabilities (ACSD)
- Multi-Faith and Spirituality Centre
- Career and Planning Services (CAPS)

- Otsenhákta Student Centre
- Concordia University Student Parents Centre (CUSP)
- Dean of Students
- LIVE Centre
- IT support (AITS)
- ASFA Student Life Volunteer Pool

Student Associations:

- ECSGA (Engineering and Computer Science Graduate Association)
- ECA (Engineering and Computer Science Association)
- Concordia Student Union
- WIE (Women in Engineering)
- GCES (Gina Cody School Entrepreneurship Society)
- EngGames (Engineering Games – Concordia University)
- Hack Concordia
- Space Concordia

8.3. Academic and student life

There are various opportunities for students to be involved in the community and in associations within the university.

- **Multi-faith and Spirituality Centre**
A home on campus for all those who wish to celebrate the human spirit, open to all students whether spiritual, secular or religious.
- **Centre for Gender Advocacy**
An independent, student-funded organization mandated to promote gender equality and empowerment particularly as it relates to marginalized communities.
- **Centre for Creative Reuse**
CUCCR is dedicated to diverting materials from inside Concordia’s waste-stream and offering them to the general community free of cost.
- **D3 Center for Innovation and Entrepreneurship**
Center for Innovation and Entrepreneurship that provides the necessary tools, resources and knowledge to move from idea to impact with confidence.
- **The SHIFT Centre for Social Transformation**
Supports existing and emerging social transformation initiatives that unite with the goal of creating a more just, inclusive and broadly prosperous Montreal.
- **Sustainability Hub**
Promoting sustainability-related initiatives, tools, resources, research, funds and programs to the Concordia community.
- **Spark!**
Inspiration for students to actively participate in learning experiences at Concordia that have a positive impact on their success.
- **Otsenhákta Student Centre**
An on-campus resource for First Nations, Métis and Inuit students to find community, plan social events and access resources to help them achieve academic success.
- **University of the Streets Café**
A program that organizes bilingual public conversations in cafés and community spaces across Montreal.
- **Zero Waste**

An initiative focused on reducing waste on campus and encouraging the Concordia community to reduce, reuse, recycle and rot.

- **Black Perspectives Office**
Connects and supports activities related to Black perspectives, initiatives and scholarship on campus and within the broader Montreal community.
- **Quebec Public Interest Research Group**
An inclusive resource centre that supports grassroots activism around diverse social and environmental issues and aims to inspire social change.
- **Office of Community Engagement**
Connecting faculty, staff and students with members of the wider Montreal community in order to build meaningful relationships.
- **Queer Concordia**
An on-campus resource centre for queer, lesbian, gay, trans, two-spirited, bisexual, asexual, intersex, questioning and allies.
- **Best Buddies**
In collaboration with Best Buddies Canada to create fun, meaningful and lasting friendships.
- **Homeroom**
A virtual place for new undergraduate students to connect and navigate the university experience together.
- **Student Association Events**
Once the BEng program is formed, a student association for the Cybersecurity Engineering bachelor's program will be started, consisting of academic representatives and social representatives for each year of the program. Academic representatives will be responsible for collecting student feedback from courses and giving it to the Undergraduate Program Director. Social representatives will be responsible for organizing social events for students, including student, staff, and faculty mixers every semester and fundraising events.

9. RESOURCES

9.1. Faculty Resources

9.1.1. Current Faculty

Full-Time Faculty Members:

Director, Dr. Chun Wang, Professor (CW)
Associate Director, Dr. Yong Zeng, Professor (YZ)
GPD (course-based), Dr. Ayda Basyouni, Senior Lecturer (AB)
GPD (thesis-based), Dr. Jun Yan, Associate Professor (JY)
Dr. Abdessamad Ben Hamza, Professor (ABH)
Dr. Ali Ayub, Assistant Professor (AiA) (To start in May 2024)
Dr. Amin Hammad, Professor (AmH)
Dr. Amr Youssef, Professor (AY)
Dr. Andrea Schiffauerova, Professor (AS)
Dr. Anjali Awasthi, Professor (AnA)
Dr. Arash Mohammadi, Associate Professor (AM)
Dr. Carol Fung, Associate Professor (CF)
Dr. Chadi Assi, Professor (CA)
Dr. Farnoosh Naderkhani, Associate Professor (FN)
Dr. Ivan Pustogarov, Assistant Professor (IP)
Dr. Jamal Bentahar, Professor (JB)
Dr. Jeremy Clark, Associate Professor (JC)
Dr. Lingyu Wang, Professor (LW)
Dr. Manar Amayri, Assistant Professor (MA)
Dr. Mohammad Mannan, Associate Professor (MM)
Dr. Mohsen Ghafouri, Assistant Professor (MG)
Dr. Mourad Debbabi, Professor (MD)
Dr. Nizar Bouguila, Professor (NB)
Dr. Rachida Dssouli, Professor (RD)
Dr. Roch Glitho, Professor (RG)
Dr. Suryadipta Majumdar, Associate Professor (SuM)
Dr. Walter Lucia, Associate Professor (WL)
Dr. Zachary Patterson, Professor (ZP)

Associate Members:

Aiman Hanna, Affiliate Assistant Professor/Senior Lecturer (AiH)
Makan Pourzandi, Affiliate Associate Professor/Research Leader at Ericsson (MP)
Serguei Mokhov, Affiliate Assistant Professor/AITS Network and Security Manager (SeM)

Please see Appendix 8 for the CVs of current faculty members. A table demonstrating the ability of the faculty to teach the planned INSE courses in this program is given below in Table 9.1.

Table 9.1. Faculty Teaching Capabilities

	Course Codes	Course Titles	Professor Initials	# of Profs
Core Courses	COMP 232	Mathematics for Computer Science	(All full time and associate members)	31
	COMP 248	Object-Oriented Programming I	(All full time and associate members)	31
	COMP 249	Object-Oriented Programming II	(All full time and associate members)	31
	COMP/SOEN 228	System Hardware	AB, ABH, AiH, AIA, AM, AY, CA, CF, CW, FN, IP, JB, JC, JY, LW, MA, MD, MG, MM, MP, NB, RD, RG, SeM, SuM, WL, YZ, ZP	28
	COMP/COEN 346	Operating Systems	AB, AiH, AIA, AM, AY, CA, CF, IP, JB, JC, JY, LW, MA, MD, MM, MP, NB, RD, RG, SeM, SuM, YZ	22
	COMP 348	Principles of Programming Languages	(All full time and associate members)	31
	COMP 352	Data Structures and Algorithms	AB, ABH, AiH, AIA, AM, AY, CA, CF, CW, FN, IP, JB, JC, JY, MA, MD, MM, MP, NB, RD, RG, SeM, SuM, WL	24
	COEN 366	Communication Networks and Protocols	AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	16
	INSE 221	Cryptography I	AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	16
	INSE 321	Cryptography II	AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	16
	INSE 331	Database Security	AB, ABH, AiH, AIA, AM, AY, CA, CF, IP, JB, JC, JY, MA, MD, MM, MP, RD, RG, SeM, SuM	20
	INSE 349	Secure Programming and Software Design	AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	16
	INSE 351	Operating System Security	AB, AiH, AIA, AM, AY, CA, CF, IP, JB, JC, JY, LW, MD, MM, MP, RD, RG, SuM, YZ	19
	INSE 390	Cybersecurity Engineering Team Design Project	(All full time and associate members)	31
	INSE 401	Usability and Human Aspects of Security	(All full time and associate members)	31
	INSE 411	Privacy: Enhancing Technologies, Analysis and Measurement	AB, AY, JC, MM, SeM, SuM	6
INSE 412	Cybercrime & Digital Forensics	AB, AY, CA, CF, IP, JC, JY, LW, MM, MP, RD, SeM, SuM	13	
INSE 413	Security Auditing and Compliance	AB, AY, JC, LW, MD, RD, SeM,	8	

			SuM	
	INSE 441	Mobile Application Security and Privacy	AB, AiH, AIA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	18
	INSE 442	Reverse Engineering, Application and Malware Analysis	AB, AiH, AIA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	18
	INSE 445	Network Security	AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	16
	INSE 452	Penetration Testing and Ethical Hacking	AB, AiH, AIA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM, YZ	19
	INSE 490	Capstone Cybersecurity Engineering Design Project	(All full time and associate members)	31
	INSE 498	Topics in Cybersecurity Engineering	AB, AiH, AIA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	18
Technical Electives	INSE 481	Blockchain Technologies & Applications	AB, AY, IP, JC, MM, SeM	6
	INSE 482	Industrial Control Systems & Critical Infrastructure Security	AY, CA, CF, JY, MD, MG, WL, ZP	8
	INSE 483	IoT and Embedded System Security	AB, AIA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MG, MM, MP, RD, RG, SeM, SuM, WL	19
	INSE 484	Quantum Computing & Security	AY, IP, JC, MM, MP	5
	INSE 485	Cybersecurity of Healthcare Systems and Devices	AM, CF, MA, MP, RG, SuM, YZ	7
	INSE 486	Cybersecurity Management & Governance	AB, AY, CF, JC, MD, MP, RD, SeM, SuM, YZ	10

9.1.2. Faculty Hiring Plan

In Year 0, we will need to select an Undergraduate Program Director with a remission of 1.5 credits to handle the launch of the program. In year 1, this course remission will increase to 3.0 credits per year for handling the operations and curriculum management tasks. In year 1, the Associate Director will be assigned the task of interfacing with the Institute for Co-operative Education for the students who are enrolled in the various internship options (Co-op program, C-Edge, ACE), also receiving a course remission of 1.5 credits per year (The same Associate Director also receive additional 1.5 credits per year for coordinating Graduate co-op programs).

Currently, CIISE has 14 faculty members with expertise in cybersecurity and closely related areas to support the proposed programs. This year (2024) we have been also allocated one tenure track position on quantum computing. In addition, as shown in Table 9.1 some of the faculty members in Quality Systems Engineering group can also teach fundamental math and computer science courses in the proposed curriculum. Several faculty members who frequently teach courses in other departments in GCS will also be asked to take more course load within CIISE. By carefully examining the potential teaching capacity of CIISE faculty members and their existing teaching load, we determined that existing CIISE faculty members can take 20 sessions a year for the newly proposed BEng. cybersecurity undergraduate program. In this case, we don't require any additional tenure-track faculty positions for this BEng. Program. In year 1, one ETA is to be made available at the commencement of full program operations. From Year 2 to Year 4, we require an additional ETA to accommodate the increased course load in each of the three years. In the following, we explain how the required resources can be used to cover the course sessions required by the program. Table 9.2 shows the number of course sessions needed for a regular typical course sequence (without co-op option)

for the first four years of the program. In this sequence one course will only be offered once per year. However, this is not sufficient to support co-op options and it does not provide the flexibility for some students who could not follow the typical sequence due to various reasons. In addition, we also need to reserve the capacity for students registered in proposed cybersecurity BSc. program. Therefore, as shown in Table 9.3, for core INSE courses, we have decided to offer two sessions a year. This way we can provide sufficient sessions to cover the need of co-op options and provide higher capacity for additional students and more flexibility for students who need an alternative sequence. For general engineering courses (ENGR/ELEC/GE) and computer science and computer engineering courses (COMP/SOEN/COEN), only one session is planned for each year. Additional sessions are not planned in this program, as these courses are offered by other programs throughout the year, which already provides flexibility and capacity for needed students.

Table 9.2 Number of sessions needed (Typical Course Sequence)

	ENGR/ELEC/GE	COMP/SOEN/COEN	INSE Core	INSE ELEC	INSE Capstone
Year 1	5	4	1	0	0
Year 2	3	4	3	0	0
Year 3	1	0	8	1	0
Year 4	2	0	4	2	2

Table 9.3 Number of sessions needed to cover co-op and provide higher capacity and more flexibility.

	ENGR/ELEC/GE	COMP/SOEN/COEN	INSE Core	INSE ELEC	INSE Capstone
Year 1	5	4	2	0	0
Year 2	3	4	6	0	0
Year 3	1	0	16	1	0
Year 4	2	0	8	2	2

Table 9.4 Accumulative Load and Resources Required

	ENGR/ELEC/GE	COMP/SOEN/COEN	INSE Core	INSE ELEC	INSE Capstone
Year 1	5	4	2	0	0
	TT (9 Sess) + TA (900 H)		TT (2 Sess) + TA (200 H)		
Year 2	8	8	8	0	0
	TT (9 Sess) +1 ETA (7 Sess) +TA (1600H)		TT (8 Sess) + TA (800 H)		
Year 3	9	8	24	1	0
	TT (10 Sess) +1 ETA (7 Sess) +TA (1700H)		TT (18 Sess) +1 ETA (7 Sess) + TA (2500 H)		
Year 4 Full Load	11	8	32	3	2
	TT (10 Sess) +1 ETA (7 Sess) +PT (2 Sess) +TA (1900H)		TT (27 Sess.) +1 ETA (7 Sess) +PT (3 Sess) +TA (3700H)		

Based on the updated course load in Table 9.3, the accumulative course sessions needed for each of the first four years and the resources needed to cover the load are as shown in Table 9.4. In Year 1 of the program, 1 ETA, 2 part-time sessions are needed to cover the 9 sessions of engineering and computer science courses. 2 sessions of INSE courses will be covered by CIISE existing faculty members. We assume that each ETA will teach 7 sessions a year. In Year 2 of the program, 2 ETA, 2 part-time sessions are needed to cover the 16 sessions of engineering and computer science courses. 8 sessions of INSE courses will be covered by CIISE existing faculty members. In Year 3 of the program, 2 ETA, 3 part-time sessions are needed to cover the 17 sessions of engineering and computer science courses. 25 sessions of INSE courses will be covered by 1 ETA (7 sessions) and CIISE existing faculty members (18 sessions). In Year 4 of the

program, 2 ETA, 5 part-time sessions are needed to cover the 19 sessions of engineering and computer science courses. 37 sessions of INSE courses will be covered by 2 ETA (14 sessions) and CIISE existing faculty members (20 sessions). The program will reach its full and regular load in Year 4.

9.1.3. Support Measures for Teaching

The Centre for Teaching and Learning (CTL) at Concordia University provides new and existing faculty members with a wide range of pedagogical and professional development support, from course design, lesson planning, teaching and assessment strategies, instructional technologies, online or blending learning, inclusive teaching practice, student engagement to course evaluations and the teaching dossier. The support is offered in various formats, from web resources, e-learning modules, and one-on-one teaching consultation, to various programming offerings and events such as workshops, webinars, New Faculty Orientation, Winterfest (teaching and learning festivals), and special projects.

CTL web resources

The CTL website houses an abundance of teaching and learning resources created or curated by the CTL staff⁴⁰. The content is constantly updated to reflect the current needs of instructors teaching at Concordia as well as to keep abreast of recent trends in faculty development in higher education. New faculty will find the website especially helpful in quickly identifying different kinds of teaching support available to them.

Teaching Academy eLearning modules

The [Teaching Academy eLearning](#) modules developed by the CTL in collaboration with eConcordia are dedicated to promoting teaching excellence and continuous professional development for faculty⁴¹. The topics are divided into modules and further segmented into micro-modules. The content in each module and micro-module both stands alone and clearly links to related topics, allowing instructors to quickly learn some strategies to meet a particular need as well as follow a learning path to systematically improve certain facets or areas in their teaching practice, such as assessment in general. Like the CTL website, Teaching Academy is also public-facing and freely available to instructors.

New Faculty Orientation

Faculty new hires are invited to participate in the annual CTL New Faculty Orientation that usually takes place in August. The event introduces new faculty members to various pedagogical support and services available to them and helps them kick-start their teaching career at Concordia by encouraging them to think about what teaching means and what it takes to be an effective teacher.

Workshop and webinars

Faculty members are advised to check the *Event* section of the CTL website regularly, especially before the start of a new term. The CTL offers [workshops and webinars](#) throughout an academic term, esp. in August, September, December, and January. The Fall and Winter semester workshop and webinar information and registration links are usually sent to departments as well, which will, in turn, be shared with all instructors⁴².

Teaching consultation

New faculty members are encouraged to book consultations with Teaching Consultants at the CTL, who can meet with instructors to provide advice, support, and resources on a wide variety of teaching-related topics. Here are some of the most common consultation topics:

1. Reviewing a course syllabus
2. Decolonizing & indigenizing the classroom/curriculum
3. Selecting and implementing the appropriate pedagogical approach, teaching strategies, and techniques, such

⁴⁰ <https://www.concordia.ca/ctl.html>

⁴¹ <https://teachingacademy.concordia.ca/>

⁴² <https://www.concordia.ca/ctl/events/workshops.html>

as: active learning, flipped classroom, group work, class discussions, etc.

4. Classroom management issues
5. Designing assignments and other assessments
6. Grading
7. Selecting the most appropriate technologies
8. Implementing inclusive teaching strategies
9. Lesson planning
10. Preparing a teaching dossier (refer to the [Teaching Dossier](#) pages on Carrefour for more information on preparing a teaching dossier⁴³.)
11. Interpreting course evaluations (refer to the [Course evaluations](#) pages on Carrefour for more information on accessing and interpreting your course evaluations⁴⁴.)

Teaching observation and feedback

Classroom Observations can be requested by instructors at any stage in their career who are interested in getting feedback on their teaching. The Teaching Consultant regularly observes classes to provide feedback on pedagogy, classroom management, etc.

Once an instructor requests an observation, the Teaching Consultant will be in touch to set up a Pre-Observation meeting to discuss background information and the instructor's specific motivation for the observation. The Teaching Consultant will observe a lecture at a pre-determined time. After the lesson, the instructor completes a reflection, and the Teaching Consultant prepares a confidential report on the lesson. Within one week of the observed lesson, the Teaching Consultant and instructor meet to discuss the lesson and review the report with observations, comments, and suggestions before it is finalized.

Course (Re)Design

If an instructor would like support in developing a new course or revamping an existing course, the CTL can work with individual or a team of instructors to ensure the development of the course follows an evidence-based approach to course design. The CTL can provide support materials and expertise on every aspect of the design of courses as they work together with instructors through each step.

Mid-course feedback

Mid-course feedback can provide valuable information for making changes in teaching before summative evaluation of a course. A teaching consultant is available to aid with interpretation of responses and offer suggestions for improving teaching effectiveness.

9.2. Administrative and support staff

9.2.1. Current Administrative, Technical and Support Staff

Department Administrator, Kimberley Adams
Assistant to the Director: Lilia Pernatozzi
Graduate Programs Coordinator, Silvie Pasquarelli
Graduate Programs Coordinator, Mireille Wahba
Office Assistant, Laura Oproiu

9.2.2. Future Administrative, Technical and Support Staff

At the launch of the undergraduate BEng program, we request one Undergraduate Program Assistant for the BEng

⁴³ <https://hub.concordia.ca/carrefour/services/faculty/teaching/teaching-dossier.html>

⁴⁴ <https://hub.concordia.ca/carrefour/services/faculty/teaching/course-evaluations.html>

program to support program operations including, for example, working with the Undergraduate Program Director in managing the program, taking on the role of answering program related queries from potential and current students, as well as supporting faculty members. We also request one technical staff member (Engineer in Residence) to support the undergraduate labs and Capstone projects. The hiring plan for staff is presented below in Table 9.5.

Table 9.5. Staff Members Hiring Plan

AY	# BEng Students*	Requested Admin	Requested Tech
2024-25	0		-
2025-26	50	Programs Assistant	Lab support technician
2026-27	120	-	
2027-28	208	-	-
2028-29	287	-	-
2029-30	325	-	-

*Cohort to grow to 100 in steady state. 10% attrition rate applied. Total enrolments in any given academic year, once a full cohort in all years is achieved, is expected to hover around 325.

9.3. Material, technological and library resources

9.3.1. Library Space and Holdings

The Concordia University Library Report is found in Appendix 6. It concludes that the collections and resources relevant to Cybersecurity Engineering are adequate to support a BEng in Cybersecurity Engineering.

9.3.2. Classroom space

Classroom space for new cybersecurity courses (lectures and tutorials) will be available at the SGW campus for the appropriate enrollments as the course grows and will be assigned through the University.

9.3.3. Laboratory space and equipment

Concordia University has invested close to half a million dollars to create a Security Research Centre that has enough space to accommodate over 30 security researchers, lab facilities, and a dedicated server room. The facility, located on the 9th floor of the Engineering and Visual Arts (EV) building, has been enhanced by over two million dollars in external research equipment grants, which supports security research activities in CIISE and Gina Cody School.

Two dedicated teaching labs are located on the 9th floor of the Hall building and are used by CIISE students enrolled in several information systems security courses for hands-on laboratories. It is anticipated that the programs can be established with relatively minor capital injections through regular capital project competitions at Concordia University. This assumes an annual intake of about 100 new students in BEng in Cybersecurity Engineering program and 100 new students in BSc in Cybersecurity program so that, with attrition, the total number of students in both programs will be around 600. If the intake significantly exceeds 100 students per year in each program, additional lab space and larger classrooms will be needed.

The department will work with multiple industrial partners specialized in cybersecurity training, such as Cisco, Hydro-Québec, and Schweitzer Engineering Laboratories (SEL), to develop unique lab components. For example:

- Cisco has donated multiple equipment to the department and was the sponsor of Concordia's Computer Security Laboratory, the predecessor to the Security Research Center. The company itself is a world leader in networking and security solutions, which also offers extensive training and certification with over 17 million past and 1.2 million current trainees worldwide. The department plans to leverage the partnership to co-design experiential learning resources for networking and security courses (e.g., INSE 441, 445, and 452) that can significantly enhance the hands-on learning experience for the students. In addition, Cisco can also participate in the design of lab components and simulation environments in these courses to integrate practical real-world scenarios into the corresponding course modules.

- Hydro-Québec is only provincial electric utility in Quebec who has partnered with CIISE faculty members on cybersecurity of power grids since 2014 and has jointly funded the NSERC Senior Industrial Research Chair on Smart Grid Security held by Dr. Mourad Debbabi since 2016. Many graduate students of the department have been participating in collaborative research and on-site internships at the Hydro-Québec Research Institute (IREQ) for smart grid security, substation security, and many other projects.
The department plans to further extend this partnership to develop new course modules (e.g., INSE 482, 486, 498), site visits, co-op programs, team design and capstone projects (INSE 390 and 490), and other opportunities that can enrich the proposed undergraduate program. As Hydro-Québec is a major stakeholder and employer in Quebec’s cybersecurity ecosystem, the partnership can benefit various courses and
- SEL is one of the largest industrial control system providers for power and energy systems in North America and have offered online courses, on-site workshops, and course embeddings across universities in the United States. The department has been discussing with SEL on the possibility to design and/or delivery lab components that can be embedded into regular courses on industrial control system cybersecurity (e.g., INSE 482 and 498). These lab components can leverage SEL devices that have been (or are being) acquired by the department, which are valued at over CAD \$500,000; they can also leverage flexible solutions offered by SEL, which are mounted on portable racks that can be conveniently networked with existing CIISE labs in the Hall Building. The department has multiple faculty members (Drs. Jun Yan, Mohsen Ghafouri, and Walter Lucia) who can integrate and deliver these lab components; in addition, SEL can also provide industrial experts to help design and deliver the components, who have extensive experience in cybersecurity for critical infrastructures.

In addition to the partners and corresponding lab component potentials above, more lab components will also be co-developed with other industrial and government partners to enrich experiential learning for the proposed program once it is launched.

All these components will be designed as virtual labs accessible from the existing CIISE teaching facilities, requiring no additional lab space physically. They will be either built as portable platforms that can be handily installed/uninstalled in the Hall building teaching labs, or as (co-)simulated modules hosted on existing CIISE computing infrastructures and remotely accessible from computers in the Hall building teaching labs, ENCS general labs, and/or student’s personal laptops.

10. BUDGET ESTIMATES

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)		\$ 131,145	\$ 314,748	\$ 545,563	\$ 753,297	\$ 854,213	\$ 2,598,966
Grants							
Teaching Grant (WFTE)		\$ 376,032	\$ 902,478	\$ 1,564,294	\$ 2,159,930	\$ 2,449,286	\$ 7,452,020
Support Grant (FTE)		\$ 103,777	\$ 249,064	\$ 431,710	\$ 596,092	\$ 675,948	\$ 2,056,591
Total grants		\$ 479,809	\$ 1,151,541	\$ 1,996,005	\$ 2,756,022	\$ 3,125,235	\$ 9,508,611
Additional Funding External	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Revenue	\$ -	\$ 610,954	\$ 1,466,289	\$ 2,541,568	\$ 3,509,319	\$ 3,979,448	\$ 12,107,577
EXPENSES	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TEACHING							
Tenure Track	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Extended Term Contrats	\$ -	\$ -	\$ 59,993	\$ 119,985	\$ 119,985	\$ 119,985	\$ 419,948
Limited Term Contracts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Course remissions	\$ 6,250	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 68,750
Technical support	\$ -	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 271,886
Part Time Contracts	\$ -	\$ -	\$ 12,500	\$ 18,750	\$ 18,750	\$ 18,750	\$ 68,750
Teacher's Assistants	\$ -	\$ 26,100	\$ 69,600	\$ 121,800	\$ 162,400	\$ 162,400	\$ 542,300
ADMIN STAFF							
Administrative Staff	\$ -	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 189,450
Total Payroll	\$ 6,250	\$ 130,867	\$ 246,860	\$ 365,302	\$ 405,902	\$ 405,902	\$ 1,561,084
OTHER EXPENSES							
Total Other Expenses	\$ 130,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 280,000
Total Expenses	\$ 136,250	\$ 160,867	\$ 276,860	\$ 395,302	\$ 435,902	\$ 435,902	\$ 1,841,084
CONCORDIA UNIVERSITY SURPLUS / (DEFI	\$ (136,250)	\$ 450,087	\$ 1,189,429	\$ 2,146,266	\$ 3,073,416	\$ 3,543,545	\$ 10,266,493

Budget Rationale

The budget as presented accounts for the full costs of the program. However, it does not include the capital costs of existing equipment invested in the Cybersecurity Center labs including equipment in the server room. Additional funds might be needed in year 3 or 4 if the enrollments are significantly higher than expected in the budget. Further, the teaching costs for the program are represented in full, whether or not the capacity already exists to teach some of the courses, or courses are offered by other departments. Regarding teaching, the number of course sessions that will be offered in each year can be found in Table 9.3. The course sessions have been allocated in the budget to tenure track, extended term appointment, and part-time faculty. Teaching assistant needs have been based on an estimate of two TAs per course on 50-hour contracts. The budget is based on the current year's hourly rate.

The rationale for administrative and technical staff has been made in a previous section. Software licencing costs are not included since they are paid by research projects by the faculty members who use the Labs for research and supervising students. However, we added operating budget cost line (under Other Expenses) starting in year 0 and are required annually: \$10K for IT software; \$10K for library requisitions; \$10K for marketing and recruitment. A \$100K start-up cost (under Other Expenses) has also been added to year 0 for new classrooms, renovation and purchasing lab equipment. So, for year 0, \$130K is allocated to the budget under Other Expenses.

We expect high enrolments in this program. Given the market analysis and surveys from both students and industry experts. We estimate a full cohort to reach 100 students. Once full, and accounting for a 10% attrition rate annually, this will result in about 325 active students in the program each year. This is the maximum number of students that we can manage without requests for additional resources in the form of tenure track faculty members and lab space. As it is, this number of students will require the labs to be running full-time at maximum capacity.

10.1. APPENDICES

- Appendix 1: Material Safety Data Sheet
- Appendix 2: Official description of the program
- Appendix 3: Course outlines and descriptions
- Appendix 3A: Graduate attribute mapping tables
- Appendix 4: Research protocols and agreements
- Appendix 5: Needs Analysis, Surveys, Market Analysis, Environmental Scans, Lightcast Job Posting Reports
- Appendix 6: Letters of Support (other departments, co-op), Library Report
- Appendix 7: Tables of Grants and Contributions to Research and Faculty Training
- Appendix 8: Faculty CVs
- Appendix 9: List of external persons consulted in the preparation of the program proposal
- Appendix 10: Letters of employment
- Appendix 11: Full detailed program expenses and revenues

Summary of Changes (New Undergraduate Program (Regular Process))

Course Changes:

	Subject Code Change	Catalogue Number Change	Title Change	Description Code Change	Prerequisite Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Component Change	Mode of Instruction Change	Cross-listed Course Change
INSE 201 Security Ethics, Laws, Standards and Compliance	X	X	X	X			X	X	X	
INSE 221 Cryptography I	X	X	X	X	X		X	X	X	
INSE 321 Cryptography II	X	X	X	X	X		X	X	X	
INSE 331 Database Security	X	X	X	X	X		X	X	X	
INSE 349 Secure Programming and Software Design	X	X	X	X	X		X	X	X	
INSE 351 Operating System Security	X	X	X	X	X		X	X	X	
INSE 390 Cybersecurity Engineering Team Design Project	X	X	X	X	X		X	X	X	
INSE 401 Usability and Human Aspects of Security	X	X	X	X	X		X	X	X	
INSE 411 Privacy: Enhancing Technologies,	X	X	X	X	X		X	X	X	

Analysis and Measurement										
INSE 412 Cybercrime and Digital Forensics	X	X	X	X	X		X	X	X	
INSE 413 Security Auditing and Compliance	X	X	X	X	X		X	X	X	
INSE 441 Mobile Security and Privacy	X	X	X	X	X		X	X	X	
INSE 442 Reverse Engineering, Application and Malware Analysis	X	X	X	X	X		X	X	X	
INSE 445 Network Security	X	X	X	X	X		X	X	X	
INSE 452 Penetration Testing and Ethical Hacking	X	X	X	X	X		X	X	X	
INSE 481 Blockchain Technologies and Applications	X	X	X	X			X	X	X	
INSE 482 Industrial Control Systems and Critical Infrastructure	X	X	X	X			X	X	X	
INSE 483 IoT and Embedded System Security	X	X	X	X			X	X	X	
INSE 484 Quantum Computing and Security	X	X	X	X			X	X	X	
INSE 485 Cybersecurity of Healthcare	X	X	X	X			X	X	X	

Systems and Devices										
INSE 486 Cybersecurity Management and Governance	X	X	X	X			X	X	X	
INSE 490 Capstone Cybersecurity Engineering Design Project	X	X	X	X	X		X	X	X	
INSE 498 Topics in Cybersecurity Engineering	X	X	X	X			X	X	X	

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
Cybersecurity Engineering Core	X	X	X
Cybersecurity Engineering Complementary Core	X	X	X
Engineering and Natural Science Group	X	X	
Cybersecurity Engineering Electives	X	X	

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: BEng in Cybersecurity Engineering

Calendar Section Type: Program

Description of Change: BEng in Cybersecurity Engineering - Degree requirements

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Program Name: BEng in Cybersecurity Engineering

Planning and Promotion: 01 Jan 0001

Program Type: None

Effective/Push to SIS date: 01 Jan 0001

Degree: None

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BEng in Cybersecurity Engineering) > Degree Requirements

Type of Change: New Program

Present Text calendar

credits

0

Proposed Text

120

credits

BEng in Cybersecurity Engineering

0

30.5 credits from the Engineering Core

49.5 credits from the Cybersecurity Engineering Core

28 credits from the Cybersecurity Engineering
Complementary Core

3 credits chosen from Engineering and Natural Science
Group: Cybersecurity Engineering

9 credits chosen from Cybersecurity Engineering
Electives

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: Cybersecurity Engineering Core

Calendar Section Type: Defined group

Description of Change: Cybersecurity Engineering Core

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BEng in Cybersecurity Engineering) > Degree Requirements > BEng in Cybersecurity Engineering

Type of Change: New Defined Group

Present Text calendar

Proposed Text

0

49.5
credits

Cybersecurity Engineering Core

0

INSE 201 Security Ethics, Laws, Standards and Compliance (1.5)
INSE 221 Cryptography I (3)
INSE 321 Cryptography II (3)
INSE 331 Database Security (3)
INSE 349 Secure Programming and Software Design (3)
INSE 351 Operating System Security (3)
INSE 390 Cybersecurity Engineering Team Design Project (3)
INSE 401 Usability and Human Aspects of Security (3)
INSE 411 Privacy: Enhancing Technologies, Analysis and Measurement (3)
INSE 412 Cybercrime and Digital Forensics (3)
INSE 413 Security Auditing and Compliance (3)
INSE 441 Mobile Security and Privacy (3)
INSE 442 Reverse Engineering, Application and Malware Analysis (3)
INSE 445 Network Security (3)
INSE 452 Penetration Testing and Ethical Hacking (3)
INSE 490 Capstone Cybersecurity Engineering Design Project (6)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: Cybersecurity Engineering Complementary
Core

Calendar Section Type: Defined group

Description of Change: Cybersecurity Engineering Complementary
Core

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BEng in Cybersecurity Engineering) > Degree Requirements > BEng in Cybersecurity Engineering

Type of Change: New Defined Group

Present Text calendar

Proposed Text

0	28 credits	Cybersecurity Engineering Complementary Core
	⊖	COMP 232 Mathematics for Computer Science (3)
		COMP 248 Object-Oriented Programming I (3.5)
		COMP 249 Object-Oriented Programming II (3.5)
		COMP 346 Operating Systems (4)
		COMP 348 Principles of Programming Languages (3)
		COMP 352 Data Structures and Algorithms (3)
		COMP 445 Data Communication and Computer Networks (4)
		SOEN 228 System Hardware (4)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: Engineering and Natural Science Group:
Cybersecurity Engineering

Calendar Section Type: Defined group

Description of Change: Engineering and Natural Science Group

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BEng in Cybersecurity Engineering) > Degree Requirements > BEng in Cybersecurity Engineering

Type of Change: New Defined Group

Present Text calendar

0

Proposed Text

credits [Engineering and Natural Science Group: Cybersecurity Engineering](#)

⊖ [Students must complete 3 credits from the following:](#)

[ENGR 245 Mechanical Analysis \(3\)](#)

[MIAE 221 Materials Science \(3\)](#)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: Cybersecurity Engineering Electives

Calendar Section Type: Defined group

Description of Change: Cybersecurity Engineering Electives

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BEng in Cybersecurity Engineering) > Degree Requirements > BEng in Cybersecurity Engineering

Type of Change: New Defined Group

Present Text calendar

Proposed Text

0

credits

Cybersecurity Engineering Electives

0

Students must complete 9 credits from the following:

INSE 481 Blockchain Technologies and Applications (3)

INSE 482 Industrial Control Systems and Critical Infrastructure (3)

INSE 483 IoT and Embedded System Security (3)

INSE 484 Quantum Computing and Security (3)

INSE 485 Cybersecurity of Health-Care Systems and Devices (3)

INSE 486 Cybersecurity Management and Governance (3)

INSE 498 Topics in Cybersecurity Engineering (3)

Rationale:

Resource Implications:

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 201

Calendar Section Type: Course

Description of Change: INSE 201 Security Ethics, Laws, Standards and Compliance

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 201 Security Ethics, Laws, Standards and Compliance (1.5 credits)

Prerequisites:

Prerequisites:

Description :

Description :

This course covers ethical professional practices and responsibilities for engineers working within Quebec and Canadian legislative frameworks, touching on four main topics: professional systems, the ethics of engineering, the professional duties of an engineer, as well as the legal dimensions of professional practice. The course covers ethics, law, professional standards, and regulating human conduct. The course also addresses several ethical concerns and challenges in cybersecurity. These issues pervade numerous aspects of the economy and society in the information age, covering a wide range of topics from human rights to international trade. Students learn about these topics, beginning with an acquaintance with the dominant ethical frameworks of the 21st century, then employing these frameworks to understand, analyze, and develop solutions for leading ethical problems in cybersecurity. Using scenarios, students are also exposed to the best practices for an ethical cybersecurity.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of the BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 221

Calendar Section Type: Course

Description of Change: INSE 221 Cryptography I

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 221 Cryptography I (3 credits)

Prerequisites:

Prerequisites:

The following course must be completed previously: COEN 231 or COMP 232 .

Description :

Description :

The introduction to this course covers cryptology, cryptography, cryptanalysis, confidentiality, integrity, authentication, non-repudiation. The following topics are then covered: mathematical background (modular arithmetic, basic algorithms, including Euclidean algorithm, extended Euclidean algorithm, square and multiply, Chinese remainder theorem); historical ciphers (shift cipher, substitution cipher, affine cipher, and Vigenere cipher); number theory problems (DLP, DHP, DDH, integer factorization); public key cryptography (RSA encryption, El-Gamal encryption, and digital signature schemes); cryptographic protocols (PKI, authentication protocols: challenge response, nonces, time stamps); symmetric key ciphers (block ciphers: DES, SPN, AES, lightweight ciphers); stream ciphers, hash functions, MAC; and side channel attacks.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of our BEng program in Cybersecurity Engineering.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 321

Calendar Section Type: Course

Description of Change: INSE 321 Cryptography II

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[INSE 321 Cryptography II](#) (3 credits)

Prerequisites:

Prerequisites:

The following course must be completed previously: [INSE 221](#) .

Description :

Description :

This course offers students an advanced mathematical background, covering the following topics: elliptic curves (introduction, the Group Law, elliptic curves over finite fields, projective coordinates, point compression, choosing an elliptic curve); lattices (lattices and lattice reduction), hard lattice problems, learning with errors (LWE), notions of security, post quantum cryptography, Shamir secret sharing, threshold-based cryptography; homomorphic cryptosystems; zero knowledge proofs; commitment schemes and oblivious transfer; advanced signature schemes (blind signature, group signature, ring signature); and secure multi-party computation (the two-party case, the multi-party case).

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of the new programs BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 331

Calendar Section Type: Course

Description of Change: INSE 331 Database Security

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 331 Database Security (3 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: COEN 352 or COMP 352 ; INSE 349 .

Description :

Description :

This course offers students recent examples of database security issues, including a brief overview of root causes; security configuration of a typical database product; operating system security principles; administration of users at the OS level vs. database level; profiles, password policies, privileges and roles; database application security models; known attacks and defences; database auditing and hardening models.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form a part of new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 349

Calendar Section Type: Course

Description of Change: INSE 349 Secure Programming and Software Design

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 349 Secure Programming and Software Design (3 credits)

Prerequisites:

Prerequisites:

The following course must be completed previously: INSE 221 .

Description :

Description :

This course offers students the fundamentals of secure programming, including string-related vulnerabilities and defense, pointer-related vulnerabilities and defense, memory management-related vulnerabilities and defense, integer-related security issues, formatted output-related security issues, concurrency-related security issues, security vulnerabilities and linking, security in sockets programming, security vulnerabilities and signals, file I/O security, best practices and coding standards, design principles for secure programming, model-based secure programming, and static analysis for secure programming.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form a part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 351

Calendar Section Type: Course

Description of Change: INSE 351 Operating System Security

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 351 Operating System Security (3 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: COEN 346 or COMP 346 ; INSE 349 .

Description :

Description :

This course includes topics such as authentication, confidentiality, integrity, access control matrix, safety result, access control list, capability list, Windows security, UNIX/Linux security, security levels, mandatory/discretionary access control, integrity levels, BLP, Biba, conflict of interest, security design principle, password security, strong authentication, dictionary attack, password salt, one-time password, Lamport's scheme, challenge response, logging and auditing, host-based intrusion detection, anomaly detection, misuse detection, memory security, secure booting, UNIX network security services and firewall, covert channel, and information flow control.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form a part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 390

Calendar Section Type: Course

Description of Change: INSE 390 Cybersecurity Engineering Team Design Project

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 390 Cybersecurity Engineering Team Design Project (3 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: ENCS 282 ; ENGR 371 ; INSE 331 , INSE 351 . The following course must be taken previously or concurrently: INSE 445 .

Description :

Description :

Students work in teams to design and implement a cybersecurity project based on requirements provided by the course instructor. Each team demonstrates the project and prepares adequate documentation for it. In addition, each team writes a report based on the process of development.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form a part of the new BEng in Cybersecurity Engineering.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 401

Calendar Section Type: Course

Description of Change: INSE 401 Usability and Human Aspects of Security

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Prerequisites:

Description :

Component(s):

Notes :

Rationale:

This course is being created to form a part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

Proposed Text

[INSE 401 Usability and Human Aspects of Security \(3 credits\)](#)

Prerequisites:

[The following course must be completed previously: INSE 321 .](#)

Description :

[This course provides students with an introduction to human aspects of security, including common evaluation methodologies for usable security; relationship between usability, deployability, and security; social engineering attacks; user study; statistical analysis for usability measurements; example evaluation of authentication in desktop vs. mobile devices, browsers, email applications, and private messaging; and defenses against social engineering attacks.](#)

Component(s):

[Lecture](#)

Notes :

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 411

Calendar Section Type: Course

Description of Change: INSE 411 Privacy: Enhancing Technologies, Analysis and Measurement

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 411 Privacy: Enhancing Technologies, Analysis and Measurement (3 credits)

Prerequisites:

Prerequisites:

The following course must be completed previously: INSE 401 .

Description :

Description :

This course is on privacy and related concepts like anonymity, confidentiality, and censorship. The course covers the following topics: hashing, bloom filters, encryption, zero-knowledge proofs, multi-party computation, k-anonymity, differential privacy, trusted execution, separation of duties, digital credentials, onion routing, cookies, privacy-preserving data analytics and machine learning, genomic privacy, financial privacy, and secret ballot voting systems.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form a part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 412

Calendar Section Type: Course

Description of Change: INSE 412 Cybercrime and Digital Forensics

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 412 Cybercrime and Digital Forensics (3 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: INSE 401 ,
INSE 442 .

Description :

Description :

This course provides students an introduction to cybercrime, including unauthorized access, mischief to data, possession of hacking tools, possession of child pornography, and others; legal aspects: Canadian judicial system, computer crime laws, charter of rights, common law, mutual legal assistance treaty, search warrants, production and assistance orders, international laws; investigation process: search planning, acquisition methods, environment recognition, evidence identification; digital forensics: tools, techniques and procedures; reporting process: investigation and analysis reports, note taking; authority of seizure; forensic interviews; computer crime trials: witness preparation, court sentencing, rebuttal witness, cross-examination, testimony, credibility attacks; and in-depth case studies.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form a part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 413

Calendar Section Type: Course

Description of Change: INSE 413 Security Auditing and Compliance

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 413 Security Auditing and Compliance (3 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: INSE 331 , INSE 351 . The following course must be completed previously or concurrently: INSE 445 .

Description :

Description :

Security auditing and compliance checking have been a popular security practice to ensure the accountability and transparency of a digital system. With the large-scale emerging technologies (including cloud computing, 5G networking, Internet of Things), the landscape of security auditing is rapidly evolving. This course prepares students with the knowledge of traditional security auditing techniques, as well as cutting-edge techniques for newer technologies. Topics include the definition of security auditing, review of existing security standards, interpreting security standards, formal verification methods and tools, machine-learning-based auditing approaches and current challenges in security auditing.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 441

Calendar Section Type: Course

Description of Change: INSE 441 Mobile Security and Privacy

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[INSE 441 Mobile Security and Privacy \(3 credits\)](#)

Prerequisites:

Prerequisites:

The following courses must be completed previously: [INSE 349](#) ,
[INSE 445](#) .

Description :

Description :

This course provides a comprehensive exploration of the security challenges and solutions within wireless and mobile communications systems. As mobile devices become ubiquitous and play an integral role in people's daily lives, securing the communication channels and data they handle is paramount. This course covers a spectrum of topics ranging from the fundamentals of wireless networks to the intricacies of mobile operating systems and applications.

Component(s):

Component(s):

[Lecture](#)

Notes :

Notes :

Rationale:

This course is being created to form part of of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 442

Calendar Section Type: Course

Description of Change: INSE 442 Reverse Engineering, Application and Malware Analysis

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 442 Reverse Engineering, Application and Malware Analysis (3 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: INSE 331 , INSE 351 .

Description :

Description :

Reverse engineering is the process of analyzing hardware or software and understanding it without having access to the source code or design documents. Malicious actors and hackers often are able to reverse-engineer systems and exploit what they find in terms of vulnerabilities. This course provides an in-depth exploration of reverse-engineering techniques and malware analysis methodologies. Students learn how to analyze and understand the inner workings of software, detect malicious activities, and develop skills to combat evolving cyber threats.

Component(s):

Component(s):

Laboratory

Notes :

Notes :

Rationale:

This course is being created to form part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 445

Calendar Section Type: Course

Description of Change: INSE 445 Network Security

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 445 Network Security (3 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: INSE 321 , INSE 349 ; COEN 366 or COMP 445 or ELEC 366 .

Description :

Description :

This course provides students with a comprehensive understanding of network security essentials. The topics covered in this course include secure data transmission, web security, domain name system (DNS) protection, wireless network security, denial-of-service (DoS) attacks and mitigation, intrusion detection systems, firewalls, and security for advanced network architectures.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form a part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 452

Calendar Section Type: Course

Description of Change: INSE 452 Penetration Testing and Ethical Hacking

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[INSE 452 Penetration Testing and Ethical Hacking](#) (3 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: [INSE 442](#) , [INSE 445](#) .

Description :

Description :

Throughout this course, students develop a comprehensive understanding of cyber attack and defense strategies. The topics covered in this course include system vulnerabilities and exploitation, hacking strategies, cyber attack tools, cybercrime acts, hacking ethics, and malware.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 481

Calendar Section Type: Course

Description of Change: INSE 481 Blockchain Technologies and Applications

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[INSE 481 Blockchain Technologies and Applications \(3 credits\)](#)

Prerequisites:

Prerequisites:

Description :

Description :

This course deals with Bitcoin and blockchain technologies, and includes topics such as digital cash, hash functions, digital signatures, Merkle trees, linked time-stamping, blockchains, Bitcoin, Ethereum, smart contracts, and Solidity FinTech.

Component(s):

Component(s):

[Lecture](#)

Notes :

Notes :

Rationale:

This course is being created to form part of new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 482

Calendar Section Type: Course

Description of Change: INSE 482 Industrial Control Systems and Critical Infrastructure

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 482 Industrial Control Systems and Critical Infrastructure (3 credits)

Prerequisites:

Prerequisites:

Description :

Description :

This introductory course provides students with the fundamental notions of feedback control systems and cyber-physical systems (CPSs), and how such systems are used to control critical industrial control systems and infrastructures. Students learn the basics of how to reproduce feedback and networked control systems in a simulation environment and how to analyze their performance. The potential vulnerability of autonomous critical infrastructure to cyber-attacks is explored, and classes of attacks affecting the security and privacy of such systems are investigated. Students learn how to emulate the presence of attacks in a simulation environment with the aim of testing their impact on control systems and critical infrastructures. Passive and active mechanisms for the detection and mitigation of cyber-attacks are investigated, and the concept of secure and resilient control is introduced. An introduction to the engineering software Matlab/Simulink is provided, with particular emphasis on how such tools can be used to design cyber-secure industrial control systems for critical infrastructures.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 483

Calendar Section Type: Course

Description of Change: INSE 483 IoT and Embedded System Security

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 483 IoT and Embedded System Security (3 credits)

Prerequisites:

Prerequisites:

Description :

Description :

This course initially provides an introduction to the concept of security and its basic definitions, proceeding with the concept of embedded systems, their application and characteristics. Then it delves into the famous attacks, lessons learned, and common vulnerabilities, and attack in general and in cases of different domains such as industrial control systems. The course describes the details inside embedded systems, such as their IO, operating system, and communication. Finally, the course provides security analysis frameworks and monitoring techniques.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 484

Calendar Section Type: Course

Description of Change: INSE 484 Quantum Computing and Security

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 484 Quantum Computing and Security (3 credits)

Prerequisites:

Prerequisites:

Description :

Description :

This course covers quantum mechanics (photon polarization, linear polarization, circular and elliptical polarization, general quantum variables, composite systems, measuring a subsystem, other incomplete measurements); quantum cryptography (the Bennett-Brassard protocol, the no-cloning theorem, quantum teleportation); error-correcting codes (linear codes, syndrome decoding); error correction for quantum key distribution, privacy amplification, quantum computing (quantum gates, the Deutsch Algorithm, universal set of quantum gates); Shor's algorithm (finding the period of $f(x)$, estimating the probability of success, efficiency of factoring); post-quantum cryptography.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity..

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 485

Calendar Section Type: Course

Description of Change: INSE 485 Cybersecurity of Healthcare Systems and Devices

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 485 Cybersecurity of Health-Care Systems and Devices (3 credits)

Prerequisites:

Prerequisites:

Description :

Description :

This course offers students an in-depth look into the unique challenges and methodologies associated with securing health-care systems and devices. It covers a range of topics, including the architecture of health-care IT systems, data privacy laws, the security of medical devices, and strategies to mitigate cybersecurity threats in health care. This course combines theoretical learning with practical case studies to prepare students for careers in health-care cybersecurity.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity..

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 486

Calendar Section Type: Course

Description of Change: INSE 486 Cybersecurity Management and Governance

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[INSE 486 Cybersecurity Management and Governance](#) (3 credits)

Prerequisites:

Prerequisites:

Description :

Description :

This course covers topics of cybersecurity management, governance and best practices in small, medium and large organizations of various types (public, private, non-profit, start-up). This includes cybersecurity and privacy policies and compliance; authentication authorization, and access control; backups; audits; monitoring and penetration testing; scheduled maintenance and patching; secure and agile software development (security by design), deployment, configuration, and maintenance; reporting responsible disclosure of breaches and vulnerabilities; incident management and response; cybersecurity organization structure; cybersecurity education (anti-phishing, ransomware) and communications; technological and legal frameworks; and government cybersecurity laws and regulations in Quebec, Canada, and world-wide.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of the new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 490

Calendar Section Type: Course

Description of Change: INSE 490 Capstone Cybersecurity Engineering Design Project

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

INSE 490 Capstone Cybersecurity Engineering Design Project (6 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: ENGR 301 , ENGR 391 ; INSE 390 . Students must have completed 75 credits in the program before enrolling.

Description :

Description :

Students work in groups to design, implement and/or validate solutions to a complex interdisciplinary cybersecurity problem, typically involving vulnerabilities, threats, and/or defenses of a security-critical system in a sandbox environment or simulated-use case. Each team demonstrates the project and prepares adequate demonstration and documentation. The project also fosters teamwork between group members and allows students to develop project management, technical writing, and technical presentation skills.

Component(s):

Component(s):

Lecture

Notes :

Notes :

Rationale:

This course is being created to form part of new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

COURSE CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BEng in Cybersecurity Engineering

Calendar Section Name: INSE 498

Calendar Section Type: Course

Description of Change: INSE 498 Topics in Cybersecurity Engineering

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Information Systems Engineering Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[INSE 498 Topics in Cybersecurity Engineering](#) (3 credits)

Prerequisites:

Prerequisites:

Description :

Description :

[This course may be offered in a given year upon the authorization of the CIISE. The course content may vary from offering to offering and will be chosen to complement the available elective courses.](#)

Component(s):

Component(s):

[Lecture](#)

Notes :

Notes :

Rationale:

This course is being created to form part of new BEng in Cybersecurity Engineering and BSc in Cybersecurity.

Resource Implications:

This course will be part of the faculty member's regular teaching load.

Impact Report

Defined Groups

Cybersecurity Engineering Complementary Core

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Course Requirements (BEng in Cybersecurity Engineering) -> Degree Requirements -> BEng in Cybersecurity Engineering
Source of Impact

Cybersecurity Engineering Core

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Course Requirements (BEng in Cybersecurity Engineering) -> Degree Requirements -> BEng in Cybersecurity Engineering
Source of Impact

Cybersecurity Engineering Electives

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Course Requirements (BEng in Cybersecurity Engineering) -> Degree Requirements -> BEng in Cybersecurity Engineering
Source of Impact

Engineering and Natural Science Group

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Course Requirements (BEng in Cybersecurity Engineering) -> Degree Requirements -> BEng in Cybersecurity Engineering
Source of Impact

Courses

INSE 201 Security Ethics, Laws, Standards and Compliance

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 221 Cryptography I

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 321 Cryptography II

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 331 Database Security

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia

Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 349 Secure Programming and Software Design

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 351 Operating System Security

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 390 Cybersecurity Engineering Team Design Project

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 401 Usability and Human Aspects of Security

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 411 Privacy: Enhancing Technologies, Analysis and Measurement

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 412 Cybercrime and Digital Forensics

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 413 Security Auditing and Compliance

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 441 Mobile Security and Privacy

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 442 Reverse Engineering, Application and Malware Analysis

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 445 Network Security

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 452 Penetration Testing and Ethical Hacking

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 481 Blockchain Technologies and Applications

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 482 Industrial Control Systems and Critical Infrastructure

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 483 IoT and Embedded System Security

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 484 Quantum Computing and Security

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 485 Cybersecurity of Healthcare Systems and Devices

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 486 Cybersecurity Management and Governance

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 490 Capstone Cybersecurity Engineering Design Project

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Information Systems Engineering Courses
Source of Impact

INSE 498 Topics in Cybersecurity Engineering

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia

Other Units

Addition of **Engineering Core to BEng in Cybersecurity Engineering** requirement

Source of other unit Impact

- Defined group is housed in Section 71.20 BEng

Addition of **COMP 232 to Cybersecurity Engineering Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 248 to Cybersecurity Engineering Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 249 to Cybersecurity Engineering Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 346 to Cybersecurity Engineering Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 348 to Cybersecurity Engineering Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 352 to Cybersecurity Engineering Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 445 to Cybersecurity Engineering Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **SOEN 228 to Cybersecurity Engineering Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **ENGR 245 to Engineering and Natural Science Group: Cybersecurity Engineering** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **MIAE 221 to Engineering and Natural Science Group: Cybersecurity Engineering** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 232 to INSE 221** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COEN 231** to **INSE 221** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 352** to **INSE 331** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COEN 352** to **INSE 331** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 445** to **INSE 445** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **ELEC 366** to **INSE 445** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COEN 366** to **INSE 445** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 346** to **INSE 351** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COEN 346** to **INSE 351** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **ENCS 282** to **INSE 390** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **ENGR 371** to **INSE 390** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **ENGR 301** to **INSE 490** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **ENGR 391** to **INSE 490** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

LOI Budget Chart



NOTE : ONLY NEED TO BE POPULATED

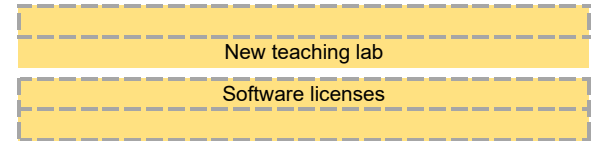
		Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5
EXPENSES							
Teaching - Number of Full Tir	TT	0	0	0	0	0	0
	%	50%	50%	50%	50%	50%	50%
	ETA	0		1	2	2	2
	%	50%	50%	50%	50%	50%	50%
	LTA						
%	50%	50%	50%	50%	50%	50%	
Lecturer							
%	50%	50%	50%	50%	50%	50%	
Number of course remissions requested		0.5	1	1	1	1	1
Technical support - Number of positions		0	1	1	1	1	1
%		50%	50%	50%	50%	50%	50%
Part Time Contracts - Number of contracts		0	0	2	3	3	3
%		50%	50%	50%	50%	50%	50%
Teacher's Assistants - Hours		0	900	2400	4200	5600	5600
Administrative Staff - Number	Director						
	%	50%	50%	50%	50%	50%	50%
	Office support	0	1	1	1	1	1
	%	50%	50%	50%	50%	50%	50%
Professional	0	0	0	0	0	0	
%	50%	50%	50%	50%	50%	50%	

Comments

Resources are shared between engineering and Science programs
Resources are shared between engineering and Science programs
Program director (1); New hires (2 + 1), 50%

LOI Budget Chart

EXPENSES		Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total	
TEACHING		Salary		Salary and Benefits					
Tenure Track	\$ 125,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Extended Term appointment	\$ 95,000	\$ -	\$ -	\$ 59,993	\$ 119,985	\$ 119,985	\$ 119,985	\$ 419,948	
Course remissions	\$ 12,500	\$ 6,250	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 68,750	
Technical support	\$ 86,108	\$ -	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 271,886	
Part Time Contracts	\$ 12,500	\$ -	\$ -	\$ 12,500	\$ 18,750	\$ 18,750	\$ 18,750	\$ 68,750	
Teacher's Assistants	\$ 29.00	\$ -	\$ 26,100	\$ 69,600	\$ 121,800	\$ 162,400	\$ 162,400	\$ 542,300	
ADMIN STAFF									
Director	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Office support	\$ 60,000	\$ -	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 189,450	
Professional	\$ 89,108	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Payroll	\$	6,250	\$ 130,867	\$ 246,860	\$ 365,302	\$ 405,902	\$ 405,902	\$ 1,561,084	
OTHER EXPENSES									
New Classroom, renovation and lab equipment - NON-CAPITAL									
New Classroom, renovation and lab equipment - C	\$ 100,000							\$ 100,000	
Operating cost	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 180,000	
Other								\$ -	
Total Other Expenses	\$	130,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 280,000	
Total Expenses	\$	136,250	\$ 160,867	\$ 276,860	\$ 395,302	\$ 435,902	\$ 435,902	\$ 1,841,084	



LOI Budget Chart

0
0

NOTE : ONLY [] NEED TO BE POPULATED

	Year 1	Year 2	Year 3	Year 4	Year 5	Comments
STUDENTS						
Cycle 1 FTE (FTE = 30 credits)						
New Cycle 1 FTE registered in the program	[50]	[75]	[100]	[100]	[100]	[]
Total credits for Program	[120]					[]
Attrition rate	[10%]					[]
TOTAL FTE	50.00	120.00	208.00	287.20	325.68	
Program Family	Weight					
[Engineering]	[2.10]					[]
Weighted FTE	105.00	252.00	436.80	603.12	683.92	

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total	
Tuition Fee								
Tuition (FTE)	[\$ 2,623]	\$ 131,145	\$ 314,748	\$ 545,563	\$ 753,297	\$ 854,213	\$ 2,598,966	
Grants								
Teaching Grant (WFTE)	[\$ 3,581]	\$ 376,032	\$ 902,478	\$ 1,564,294	\$ 2,159,930	\$ 2,449,286	\$ 7,452,020	
Support Grant (FTE)	[\$ 2,076]	\$ 103,777	\$ 249,064	\$ 431,710	\$ 596,092	\$ 675,948	\$ 2,056,591	
Total grants		\$ 479,809	\$ 1,151,541	\$ 1,996,005	\$ 2,756,022	\$ 3,125,235	\$ 9,508,611	
External	[]	[]	[]	[]	[]	[]	\$ -	[]
Total Revenue	\$ -	\$ 610,954	\$ 1,466,289	\$ 2,541,568	\$ 3,509,319	\$ 3,979,448	\$ 12,107,577	
Additional Funding								
Internal								
Provost Office	[]	[]	[]	[]	[]	[]	\$ -	[]
Institutional	[]	[]	[]	[]	[]	[]	\$ -	[]
Capital Fund (1)	[]	[]	[]	[]	[]	[]	\$ -	[]
Other	[]	[]	[]	[]	[]	[]	\$ -	[]
Total internal sources of funding for	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	

0
0

Program Financial Viability

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)		\$ 131,145	\$ 314,748	\$ 545,563	\$ 753,297	\$ 854,213	\$ 2,598,966
Grants							
Teaching Grant (WFTE)		\$ 376,032	\$ 902,478	\$ 1,564,294	\$ 2,159,930	\$ 2,449,286	\$ 7,452,020
Support Grant (FTE)		\$ 103,777	\$ 249,064	\$ 431,710	\$ 596,092	\$ 675,948	\$ 2,056,591
Total grants		\$ 479,809	\$ 1,151,541	\$ 1,996,005	\$ 2,756,022	\$ 3,125,235	\$ 9,508,611
Additional Funding External	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Revenue	\$ -	\$ 610,954	\$ 1,466,289	\$ 2,541,568	\$ 3,509,319	\$ 3,979,448	\$ 12,107,577
EXPENSES							
TEACHING							
Tenure Track	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Extended Term Contrats	\$ -	\$ -	\$ 59,993	\$ 119,985	\$ 119,985	\$ 119,985	\$ 419,948
Limited Term Contracts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Course remissions	\$ 6,250	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 68,750
Technical support	\$ -	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 271,886
Part Time Contracts	\$ -	\$ -	\$ 12,500	\$ 18,750	\$ 18,750	\$ 18,750	\$ 68,750
Teacher's Assistants	\$ -	\$ 26,100	\$ 69,600	\$ 121,800	\$ 162,400	\$ 162,400	\$ 542,300
ADMIN STAFF							
Administrative Staff	\$ -	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 189,450
Total Payroll	\$ 6,250	\$ 130,867	\$ 246,860	\$ 365,302	\$ 405,902	\$ 405,902	\$ 1,561,084
OTHER EXPENSES							
Total Other Expenses	\$ 130,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 280,000
Total Expenses	\$ 136,250	\$ 160,867	\$ 276,860	\$ 395,302	\$ 435,902	\$ 435,902	\$ 1,841,084
CONCORDIA UNIVERSITY SURPLUS / (DEFICIT)	\$ (136,250)	\$ 450,087	\$ 1,189,429	\$ 2,146,266	\$ 3,073,416	\$ 3,543,545	\$ 10,266,493

Faculty Financial Viability

ADDITIONAL BASE FUNDING		Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Additional Base Funding per FTE	\$ 900			\$ 45,000	\$ 108,000	\$ 187,200	\$ 258,480	\$ 598,680
Additional Base Funding per WFTE	\$ 1,200			\$ 126,000	\$ 302,400	\$ 524,160	\$ 723,744	\$ 1,676,304
Additional Base funding - full time TT Hire	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Additional Provost, External, Capital or Institutic	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Additionnal Funding	\$ -	\$ -	\$ 171,000	\$ 410,400	\$ 711,360	\$ 982,224	\$ 2,274,984	

ADDITIONAL EXPENSES		Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Payroll	\$ 6,250	\$ 130,867	\$ 246,860	\$ 365,302	\$ 405,902	\$ 405,902	\$ 1,561,084	
Other Expenses	\$ 130,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 280,000	
Total Expenses	\$ 136,250	\$ 160,867	\$ 276,860	\$ 395,302	\$ 435,902	\$ 435,902	\$ 1,841,084	
FACULTY SURPLUS / (DEFICIT)	\$ (136,250)	\$ (160,867)	\$ (105,860)	\$ 15,098	\$ 275,458	\$ 546,322	\$ 433,900	

Appendix 2: Official Program Description

Cybersecurity Engineering is concerned with engineering science and design principles related to safeguarding computers, electronic communication systems, and data from harm, unauthorized access, and manipulation. Its focus includes ensuring the availability, integrity, authenticity, confidentiality, and non-repudiation of information within electronic communications and systems. As an integral component of contemporary life, cybersecurity has emerged as a rapidly expanding industry, reflecting its essential role in safeguarding digital infrastructure worldwide. Cybersecurity engineering design challenges encompass a spectrum of complexities, such as scaling up security measures from individual systems to large-scale networks, integrating diverse security technologies and protocols across different platforms, assessing, and maintaining cybersecurity throughout the system's lifecycle, and implementing robust control methodologies to safeguard against cyber threats while ensuring data integrity and privacy.

Cybersecurity engineers are typically trained to serve as designers, analysts, and administrators in both public and private sectors, encompassing information technology (IT) systems and operational technology (OT) systems. They are also involved in operations, development, planning, and technical support. Given the pervasive nature of cybersecurity across organizations and businesses, cybersecurity engineers find employment in sectors related to IT/OT, such as management, banking, healthcare, insurance, policy, and more. Their training and skills frequently complement those of decision-makers and executives in ensuring the secure operation of businesses.

The Cybersecurity Engineering curriculum brings together both general computer science principles and specialized cybersecurity focuses. It comprises fundamental engineering courses and technical electives which allow students to obtain advanced knowledge in fields of interest and expected future activities in a variety of difference domains, including information security, critical infrastructure security, network security, application security, storage security, cloud security, Internet of Things (IoT) security, mobile security, etc.

Appendix 3: Course outlines and descriptions

Concordia Institute for Information Systems Engineering INSE 201 – Security Ethics, Laws, Standards and Compliance (1.5 credits)
<i>Course Instructor: Rachida Dssouli</i> rachida.dssouli@concordia.ca <i>Office: EV 7.627</i>
Office Hours: <i>Virtual on Zoom (link will be posted on Moodle). For in-person meeting, please email.</i>
Tutorials: Please see your class schedule for details
Labs: Please see your class schedule for details
Course Calendar Description: <p>This course covers ethical professional practices and responsibilities for engineers working within Quebec and Canadian legislative frameworks, touching of four main topics: professional systems, the ethics of engineering, the professional duties of an engineer, as well as the legal dimensions of professional practice. Throughout the course, we will cover ethics, law, professional standards, and regulating human conduct. We will also address several ethical concerns and challenges in cybersecurity. These issues pervade numerous aspects of the economy and society in the information age, covering a wide range of topics from human rights to international trade. Students will learn about these topics, beginning with an acquaintance with the dominant ethical frameworks of the 21st century, then employing these frameworks to understand, analyze, and develop solutions for leading ethical problems in cybersecurity. Students will also be exposed to the best practices for an ethical cybersecurity using scenarios.</p>
Prerequisites: N/A Co-requisites: N/A
Specific Knowledge and Skills Needed for this Course: Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline. <i>Insert specific knowledge and skills here</i> N/A

Course materials Required

Textbook: N/A

1. Lecture slides and other related materials will be made available via the course Moodle site.
2. Manjikian, Mary. Cybersecurity ethics: an introduction. Routledge, 2017.
3. Shannon Vallor and William J. Rewak, An Introduction to Cybersecurity Ethics. Available online <https://www.scu.edu/media/ethics-center/technology-ethics/IntroToCybersecurityEthics.pdf> <https://www.scu.edu/media/ethics-center/technology-ethics/IntroToCybersecurityEthics.pdf>
4. Cybersecurity laws in Canada 2024
<https://iclg.com/practice-areas/cybersecurity-laws-and-regulations/canada#:~:text=Cybercrime,-1.1%20Would%20any&text=Yes%2C%20it%20is%20an%20offence,C%2D46>

Grading Scheme

1. 25%: Project (may include programming, report writing, in-person presentations)
2. 35%: Quiz 1
3. 40%: Quiz 2

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule (subject to modification)

1. Introduction to ethics
2. Professional practice and responsibility for engineering in Quebec (OIQ).
3. Cybersecurity Laws and Regulations Canada
4. The problem of privacy (Online privacy: definition, and debate for and against. Online privacy tools such as TOR, Deep Web, Dark Web, user tracking, the European General Data Protection Regulation (GDPR), IoT privacy, ethical considerations of sharing data for cybersecurity research, Health information privacy (HIPAA))
5. The problem of (mass) surveillance (Debate for and against. Encryption laws and policies, Key escrow, backdoors, Apple vs FBI case study)
6. The problem of online piracy (Debate for and against. File sharing networks)
7. The problem of cyberwarfare (It is a war but what is considered legal in the eyes of international law)
8. Cybersecurity professionals' obligations to the public and ethical best practices (Ethical hacking, responsible disclosure, risk consideration, accountability, etc.). Cybersecurity code of conduct.
9. Case studies (e.g., Security and privacy tradeoffs in medical devices; ethical issues in cyber-physical systems)

Lab Details

N/A

Engineering Tools

N/A

**Details on assessment tools:
See under “Grading Scheme”**

Other information

N/A

This semester this course will emphasize and develop the Canadian Engineering Accreditation Board (CEAB) graduate attributes of Ethics and Equity, Professionalism, and Life-long Learning.

The ethics and equity attribute is defined by the CEAB as: An ability to apply professional ethics, accountability, and equity. More specifically, students will be assessed on their abilities to:

- Understand what ethics are
- Differentiate between ethics, morals, values, and law
- Identify theoretical basis for ethical reasoning
- Apply ethical reasoning to resolve professional dilemmas
- Understand of accountability to the engineering profession
- Understand of accountability to the public
- Appreciate challenges to accountability in organizations
- Apply accountability to professional context
- Identify professional obligations against discrimination
- Appreciate gender dimensions of equity

This attribute will be assessed in quizzes and the final examination.

The professionalism attribute is defined by the CEAB as: An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest. More specifically, students will be assessed on their abilities to:

- Appreciate the role filled by professional engineers in society
- Describe the role of engineers in Quebec's professional system
- Differentiate between professional and personal roles
- Distinguish between dimensions of responsibility – moral, legal & social
- Identify legal issues on occupational safety and intellectual property
- Apply responsibility in professional context
- Demonstrate a good understanding of liability in Quebec's legal system
- Communicate through accepted professional means.
- Identify relevant professional standards

This attribute will be assessed in tutorials, quiz 1 and quiz 2.

The life-long learning attribute is defined by the CEAB as: An ability to identify and to address their own educational needs in a changing world, sufficiently to maintain their competence and contribute to the advancement of knowledge. More specifically, students will be assessed on their abilities to:

- Assess a physical problem and identify the knowledge necessary to solve it
- Self-acquire necessary information from different sources
- Show awareness of various engineering organizations for training opportunities

This attribute will be assessed in the "Knowledge Quest" portion of the online course material.

Course Learning Outcomes (CLOs):

By the end of this course, learners will be able to:

1. Describe the main features of the Professional Order of Engineers in Quebec and Canada
2. Analyze ethical dilemmas in the field of engineering using ethical reasoning
3. Identify the professional duties and obligations of an engineer
4. Recognize the legal dimensions of professional practices.

In addition, students are expected to master cybersecurity ethics and actual Canadian law related to computer crimes.

1. Cybersecurity Ethics challenges
2. Actual cybersecurity code of conduct
3. Actual Canadian law related to cybersecurity and computer crimes
4. Understanding the limitations of cybersecurity ethics framework.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 221 Cryptography I (3 credits)**

Course Instructor:

Ayda Basyouni

ayda.basyouni@concordia.ca

Office Hours:

Monday 13:00-14:30

Tutorials:

Please see your class schedule for details

Tutors: TBA

Course Calendar Description:

Introduction (cryptology, cryptography, cryptanalysis, confidentiality, integrity, authentication, non-repudiation); mathematical background (modular arithmetic, basic algorithms, including Euclidean algorithm, extended Euclidean algorithm, square and multiply, Chinese remainder theorem); historical ciphers (shift cipher, substitution cipher, affine cipher, Vigenere cipher, number theory problems (DLP, DHP, DDH, integer factorization); public key cryptography (RSA encryption, El-Gamal encryption); public key cryptography (digital signature schemes); cryptographic protocols (PKI, authentication protocols: challenge response, nonces, time stamps); symmetric key ciphers (block ciphers: DES, SPN, AES, lightweight ciphers); stream ciphers, hash functions, MAC; side channel attacks.

Prerequisites: COEN 231 or COMP 232

Specific Knowledge and Skills Needed for this Course:

Although there are no formal course pre-requisites for this class, students are expected to have basic mathematics fundamentals including basic algebra and basic probability theory; familiarity with modular arithmetic, number theory, and the concept of mathematical proofs.

Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Course Materials

Optional Textbook(s):

[1] Smart, Nigel P. *Cryptography made simple*. Springer publication, 2016.

[2] Menezes, Alfred J., Paul C. Van Oorschot, and Scott A. Vanstone. *Handbook of applied cryptography*. CRC press, 2018.

[3] Stinson, Douglas R. *Cryptography: theory and practice*. Chapman and Hall/CRC, Third Edition.

Grading Scheme

Evaluation Tool	Weight
Midterm Exam	25%
Final Exam	50%
Assignments	10%
Project	15%
Total	100%

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule:

Week	Topics
1	Introduction (Basic concepts and definitions: Cryptography, Cryptanalysis, Confidentiality, Integrity, Authentication, Non-repudiation, etc)
2	Mathematical Background (Modular Arithmetic, Basic Algorithms including Euclidean algorithm, extended Euclidean algorithm, Square and Multiply, Chinese Remainder Theorem)
3	Historical ciphers (Shift cipher, Substitution Cipher, Affine Cipher, Vigenere Cipher)
4	Number Theory Problems (DLP, DHP, DDH, Integer Factorization)
5-6	Public Key Cryptography (RSA Encryption, El-Gamal Encryption)
7	Public Key Cryptography (Digital Signature Schemes)
8	Cryptographic Protocols (PKI, Authentication Protocols: Challenge Response, nonces, time stamps)
9	Symmetric Key Ciphers (Block ciphers: DES, SPN, AES, Lightweight ciphers)
10-11	Stream Ciphers, Hash Functions, MAC
12	Implementation Issues (Side Channel attacks)

Engineering Tools

Throughout the course project and assignments, students will gain experience using cryptographic libraries (e.g., OpenSSL) and number theory computational tools such as Maple.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of the Cybersecurity Engineering Undergraduate program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating the following graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Graduate Attribute	Indicators		Assessment results reported
Knowledge-base for Engineering	<ul style="list-style-type: none"> • Knowledge base of mathematics. 	Intermediate	Yes
	<ul style="list-style-type: none"> • Knowledge- base in a specific domain. 	Intermediate	Yes
Problem analysis	<ul style="list-style-type: none"> • Problem identification and formulation. 	Intermediate	Yes
Use of Engineering tools	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources. 	Intermediate	Yes
	<ul style="list-style-type: none"> • Ability to select appropriate tools, techniques, and resources. 	Intermediate	Yes
	<ul style="list-style-type: none"> • Demonstrate awareness of limitations of tools, create and extend tools as necessary. 	Intermediate	Yes
Individual and teamwork	<ul style="list-style-type: none"> • Cooperation and work ethics. 	Intermediate	Yes
	<ul style="list-style-type: none"> • Contribution: practical/conceptual 	Intermediate	Yes
Ethics and equity	<ul style="list-style-type: none"> • Professional ethics and accountability 	Advanced	Yes

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected:

Course Learning Outcomes	Related Graduate Attributes
Develop a strong foundation in cryptographic concepts, including confidentiality, integrity, authentication, and non-repudiation.	<ul style="list-style-type: none"> • Knowledge base of mathematics. • Knowledge- base in a specific domain. • Professional ethics and accountability
Master Public Key Cryptography with a focus on RSA and El-Gamal Encryption, as well as Symmetric Key Ciphers, covering DES, SPN, AES, and lightweight ciphers.	<ul style="list-style-type: none"> • Knowledge base of mathematics. • Knowledge- base in a specific domain. • Problem identification and formulation. • Cooperation and work ethics. • Contribution: practical/conceptual. • Professional ethics and accountability
Understand cryptographic protocols and grasp implementation issues, particularly related to side-channel attacks.	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources. • Ability to select appropriate tools, techniques, and resources. • Demonstrate awareness of limitations of tools, create and extend tools as necessary. • Cooperation and work ethics. • Contribution: practical/conceptual. • Professional ethics and accountability
Critically assess cryptographic strengths and weaknesses, demonstrating practical application by implementing and testing cryptographic algorithms in real-world scenarios.	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources. • Ability to select appropriate tools, techniques, and resources. • Demonstrate awareness of limitations of tools, create and extend tools as necessary. • Cooperation and work ethics. • Contribution: practical/conceptual. • Professional ethics and accountability

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Concordia Institute for Information Systems Engineering INSE 321 Cryptography II (3 credits)

Course Instructor:

Ayda Basyouni

ayda.basyouni@concordia.ca

Office Hours:

Monday 13:00-14:30

Tutorials:

Please see your class schedule for details

Tutors: TBA

Course Calendar Description:

This course offers students an advanced mathematical background: elliptic curves (introduction, the Group Law, elliptic curves over finite fields, projective coordinates, point compression, choosing an elliptic curve); lattices (lattices and lattice reduction), hard lattice problems, learning with errors (LWE), notions of security, post quantum cryptography, Shamir secret sharing, threshold-based cryptography; homomorphic cryptosystems; zero knowledge proofs; commitment schemes and oblivious transfer; advanced signature schemes (blind signature, group signature, ring signature); secure multi-party computation (the two-party case, the multi-party case).

Prerequisites: INSE 221

Specific Knowledge and Skills Needed for this Course:

N/A

Course materials

Some of the concepts covered in this course are not explained in textbooks. Students are expected to consult technical publications from specialized cryptographic conferences such as CRYPTO, EUROCRYPT, ASIACRYPT, and SAC.

Optional Textbook(s):

[1] Smart, Nigel P. *Cryptography made simple*. Springer publication, 2016.

[2] Menezes, Alfred J., Paul C. Van Oorschot, and Scott A. Vanstone. *Handbook of applied cryptography*. CRC press, 2018.

[3] Stinson, Douglas R. *Cryptography: theory and practice*. Chapman and Hall/CRC, Third Edition.

Grading Scheme

Evaluation Tool	Weight
Midterm Exam	25%
Final Exam	50%
Assignments	10%
Project	15%
Total	100%

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule

Week	Topics
1-3	Advanced Mathematical Background: Elliptic Curves (Introduction, The Group Law, Elliptic Curves over Finite Fields, Projective Coordinates, Point Compression, Choosing an Elliptic Curve); Lattices (Lattices and Lattice Reduction), Hard Lattice Problems, Learning With Errors (LWE); Notions of Security
4-5	Post Quantum Cryptography
6	Shamir Secret Sharing, Threshold-based Cryptography
7-8	Homomorphic Cryptosystems
9	Zero Knowledge Proofs
10	Commitment Schemes and Oblivious Transfer
11	Advanced Signature Schemes (Blind Signature, Group Signature, Ring Signature)
12	Secure Multi-party Computation (The two-party case, the Multiparty case)

Engineering Tools

Throughout the course project and assignments, students will gain experience using cryptographic libraries (e.g., OpenSSL) and number theory computational tools such as Maple.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of the Cybersecurity Engineering Undergraduate program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating the following graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Graduate Attribute	Indicators	Level of coverage	Assessment results reported
Knowledge-base for Engineering	<ul style="list-style-type: none"> • Knowledge base of mathematics. 	Advanced	Yes
	<ul style="list-style-type: none"> • Knowledge- base in a specific domain. 	Advanced	Yes
Problem analysis	<ul style="list-style-type: none"> • Problem identification and formulation. 	Advanced	Yes
Use of Engineering tools	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources. 	Advanced	Yes
	<ul style="list-style-type: none"> • Ability to select appropriate tools, techniques, and resources. 	Advanced	Yes
	<ul style="list-style-type: none"> • Demonstrate awareness of limitations of tools, create and extend tools as necessary. 	Advanced	Yes
Individual and teamwork	<ul style="list-style-type: none"> • Cooperation and work ethics. 	Advanced	Yes
	<ul style="list-style-type: none"> • Contribution: practical/conceptual. 	Advanced	Yes
Ethics and equity	<ul style="list-style-type: none"> • Professional ethics and accountability 	Advanced	Yes

Course Learning Outcomes (CLOs):

By the end of this advanced cryptography course, students are expected:

Course Learning Outcomes	Related Graduate Attributes
Develop a deep understanding of advanced mathematical cryptographic concepts, including Elliptic Curves and Lattices and associated notions of security.	<ul style="list-style-type: none"> • Knowledge base of mathematics. • Knowledge- base in a specific domain. • Professional ethics and accountability
Explore and critically analyze advanced cryptographic algorithms and cryptographic Protocols including Homomorphic Cryptosystems, Zero Knowledge Proofs, Commitment Schemes, Oblivious Transfer, and advanced signature schemes	<ul style="list-style-type: none"> • Knowledge base of mathematics. • Knowledge- base in a specific domain. • Problem identification and formulation. • Cooperation and work ethics. • Contribution: practical/conceptual. • Professional ethics and accountability
Understand the principles of Secure Multi-party Computation.	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources. • Ability to select appropriate tools, techniques, and resources. • Demonstrate awareness of limitations of tools, create and extend tools as necessary. • Cooperation and work ethics. • Contribution: practical/conceptual. • Professional ethics and accountability

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Concordia Institute for Information Systems Security
INSE 331 Database Security (3 credits)

Course Instructor:

Office Hours:

Tutorials: Please see your class schedule for details

Labs: Please see your class schedule for details

Course Calendar Description:

This course will offer students recent examples of database security issues, including a brief overview of root causes; security configuration of a typical database product; operating system security principles; administration of users at the OS level versus database level; profiles, password policies, privileges and roles; database application security models; known attacks and defences; database auditing and hardening models.

Prerequisites: INSE 349; COEN 352 or COMP 352

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Insert specific knowledge and skills here

N/A

Course materials

Required Textbook: *N/A*

Grading Scheme

1. 15%: Project (may include programming, report writing, in-person presentations)
2. 20%: midterm exam
3. 65%: final exam

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule (subject to modification)

1. Introduction: Typical database security issues faced by enterprises
2. Installing and configuring a typical database product
3. Operating system security principles
4. Administration of users
5. Profiles, password policies, privileges and roles
6. Database application security models
7. Known attacks and defences
8. Database auditing and hardening models

Lab Details

N/A

Engineering Tools

N/A

Details on assessment tools:
See under “Grading Scheme”

Other information

N/A

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of both the Computer Science and Software Engineering program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating five graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Attribute 1: Knowledge-base for Engineering. This attribute is covered through learning basic concepts in cryptography and security, and how to use these concepts in solving (relatively) small, real-world problems. It will be evaluated by exams and assignments/projects, using the following indicators: Indicator 1.1: Knowledge base of mathematics; and Indicator 1.3: Knowledge- base in a specific domain.

Attribute 2: Problem analysis. This attribute is covered through the analysis of given scenarios to find the right tools and primitives for a practical solution. This will be evaluated by assignments/projects, using the following indicator: Indicator 2.1: Problem identification and formulation.

Attribute 3: Use of Engineering tools. This attribute is covered through the identification and use of appropriate cryptographic libraries and security tools for a given problem. This will be evaluated by assignments/projects, using the following indicators: Indicator 5.1: Ability to use appropriate tools, techniques and resources; Indicator 5.2: Ability to select appropriate tools, techniques, and resources; and Indicator 5.3: Demonstrate awareness of limitations of tools, create and extend tools as necessary.

Attribute 6: Individual and team work. This attribute is covered through the successful completion and delivery of group assignments/projects. The following indicators will be used in evaluation: Indicator 6.1: Cooperation and work ethics; and Indicator 6.2: Contribution: practical/conceptual.

Attribute 10: Ethics and equity. This attribute is covered through the understanding of ethical and social issues relate to computer security and privacy. Current best practices for using security tools and application analysis will be discussed. This attribute will be evaluated by assignments/projects, using the following indicator: Indicator 10.1: Professional ethics and accountability.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following engineering concepts.

1. Understanding of current database technology and common security techniques used.
2. Understanding of the relationship between OS security, database security, and application security.
3. Understanding database security and administration.
4. Administering user profiles, password policies, privileges and roles.
5. Managing database security on application level.
6. Database auditing for security and reliability.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Textbook

The primary textbook used for the course is [1]. The book, as as a coursepack, was specifically compiled by Patrick Boismenu for this course and is available online. Suggestions for additional readings will be provided for each lecture topic. There are additional useful resources on the subject that we may refer to for one concept or another throughout the class. They are listed under the “References” section: [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22].

Tentative Schedule

Week	Dates	What (lecture time)	Deliverable	Dates
1	Week of June 29	Course Introduction. Introduction to investigations and the Canadian Justice System.	Initial project out	
2.1	Week of July 6	Canadian computer crimes laws. C.E.R.T. Cybercrime case studies (ConU, DDoS)	Project topic selection due Team formation due	DNE deadline July 02
2.2	Week of July 8	Warrants; production and assistance orders. Technological crime search planning.		
3.1	Week of July 13	Forensic analysis, lessons learned.		
3.2	Week of July 15	Cybercrime case study (phishing) Investigation Report, Analysis Report		
4.1	Week of July 20	Cybercrime case study (MAC spoofer)		
4.2	Week of July 22	Quiz	Quiz 1	Wed, July 22, 24h
5.1	Week of July 27	Computer crime interviews, cybercrime Community policing, court sentencing impacts.		DISC deadline July 27
5.2	Week of July 29	Cybercrime case study		
6.1	Week of August 3	Computer crime trials, practical assessment review.		
6.2	Week of August 6	Cybercrime case study		
7.1	Week of August 10	Formalism in cybercrime investigations, Formal modeing, and event reconstruction		
7.2	Week of August 12	Quiz	Quiz 2	Wed, Aug 12, 24h
8.1	Week of August 17	Digital forensic tools and techniques		
8.2	Week of August 18	Project presentations	Project due	Fri, Aug 21, 23:59

Administrative Policies

Grading

Grades will be based on the following components:

1. Quizzes [40%]: 2 quizzes (approx 1-hr each, closed book), 20% each
2. Project [60%]: one nearly course-long group project
3. Failing grade: lack of regular effort will result in the failing grade. Specifically, in order to pass the course you must receive at least 50% of the overall possible marks.

NOTE: Should you fail to write a quiz and you have a valid justification (e.g., doctor’s note) then the weight of the quiz in question will be added to another quiz on the case-by-case basis.

NOTE: There is no *a priori* rule for translation of a numerical grade to a letter grade.

Electronic submission is expected via a git repo tag and EAS Additional details will be given in the class or via the mailing list. Students should be aware of the University's Code of Conduct (academic) as specified at the Academic Integrity web site, especially the parts concerning cheating, plagiarism, and the possible consequences of violating this code.

NOTE: This course outline is tentative, i.e., subject to changes and adjustments as we go along.

Contribution

In usual circumstances, it is expected that all members of a group end up with the same project mark. However, this must not be considered as a rule. For reasons of fairness, different evaluations will be considered to award those who provided outstanding input to the project, and to penalize those who provided minimal (below expectations) input to the project in case of disputes within the team. The team members would be expected to provide individual logs and timesheets of their contributions in the case of disputes.

Course Web Page and Mailing List

These are two more resources to be used frequently. The additional materials, grades, etc. will be published on the web page at: [insert the web page]

A mailing list has been created for discussion of the course topics among students and the instructors; to ask and answer questions related to the course, etc. All the announcements will be directed to that list as well. All the students and instructors must be subscribed to the mailing list.

Additional Materials

Additional materials, such as lecture notes and slides, examples, etc. will be provided by the instructor. The instructor will try his best to make the notes concise and complete as much as possible. Some materials may be borrowed from previous instructors for this or related courses, primarily Patrick Boismenu, Mourad Debbabi, and others.

The Project

The project represents the main component of the course. The project will be developed as a cooperative (group) project. Each group will be composed of about 5–7 students. More details to follow.

Disclaimer

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

Student Services

Need help? There are a variety student services available to you should you struggle through your studies and if the instructor for some reason is unable to help you. They are:

- Concordia Counseling and Development offers career services, psychological services, student learning services, etc.
<http://www.concordia.ca/students/counselling.html>
- The Concordia Library Citation and Cycle Guides:
<http://library.concordia.ca/help/citing/index.php>
- Advocacy and Support Services:
<https://www.concordia.ca/offices/advocacy.html>
- Student Success Centre:
<https://www.concordia.ca/students/success.html>
- New Student Program:
<https://www.concordia.ca/students/success/new.html>
- Office for Students with Disabilities:
<http://www.concordia.ca/students/accessibility.html>
- The Academic Integrity Website:
<http://www.concordia.ca/students/academic-integrity.html>
- Financial Aid & Awards:
<http://www.concordia.ca/offices/faao.html>
- Health Services:
<https://www.concordia.ca/students/health.html>

References

- [1] Patrick Boismenu. *INSE691E: Cybercrime Investigation, Lecture Notes*. Concordia University, 2012.
- [2] Steven Anson, Steve Bunting, Ryan Johnson, and Scott Pearson. *Mastering Windows Network Forensics and Investigation*. Sybex, 2 edition, June 2012.
- [3] Corey Thuen. Understanding counter-forensics to ensure a successful investigation. [online], University of Idaho, 2007. <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.138.2196>.
- [4] Craig D. Ball. Helping lawyers master technology. [online], blog, column, publications, 2006–2013. http://www.craigball.com/Ball_Technology.
- [5] The HoneyNet Project. *Know Your Enemy*. HoneyNet, 2nd edition, 2004.

- [6] K. Mandia, C. Prorise, and M. Pepe. *Incident Response and Computer Forensics*. McGraw-Hill, 2nd edition, 2003.
- [7] Craig Pearce. Helix: Open-source forensic toolkit. [online], April 2005. <http://www.e-fense.com/helix>.
- [8] Brian D. Carrier. The Sleuth Kit. [online], 2006–2013. <http://www.sleuthkit.org/sleuthkit/>.
- [9] Dan Mares. Software links for forensics investigative tasks. [online], 2006. <http://www.dmares.com/maresware/SITES/tasks.htm>.
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<p>INSE 349 Secure Programming and Software Design</p> <p>(Should be cross-listed with INSE6600 if already approved)</p> <p>Concordia Institute for Information Systems Engineering</p> <p>Term: TBD</p>
<p>Course Instructor: <i>Instructor</i> <i>instructor@ciise.concordia.ca</i></p>
<p>Office Hours: <i>Monday 10:0 am-11:30 am</i></p>
<p>Tutorials: Please see your class schedule for details Tutors: TBA</p>
<p>Course Calendar Description: Fundamentals of secure programming. String-related vulnerabilities and defense. Pointer-related vulnerabilities and defense. Memory management-related vulnerabilities and defense. Integer-related security issues. Formatted output-related security issues. Concurrency-related security issues. Security Vulnerabilities and Linking. Security in Sockets programming. Security Vulnerabilities and Signals. File I/O Security. Best practices and coding standards. Design principles for secure programming. Model-based secure programming. Static Analysis for secure programming. A project.</p>
<p>Prerequisites: INSE 221: Cryptography I</p>
<p>Specific Knowledge and Skills Needed for this Course:</p> <p>Students taking this course are expected to have sufficient knowledge of programming in C and C++</p> <p>Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.</p>
<p>Course materials Recommended Textbook:</p> <p>Robert C. Seacord, Secure Coding in C and C++ 2nd Edition, Addison-Wesley, ISBN: 0321335724.</p>
<p>Grading Scheme</p> <p>50%: Final exam 25%: Midterm exam 10%: Assignments 15%: Project</p>

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule

Week 1: Introduction to secure programming

Week 2: String-related vulnerabilities and defense (Common string manipulation errors, string vulnerabilities, mitigation strategies, runtime protection strategies)

Weeks 3-4: Pointer-related vulnerabilities and defense (Pointer subterfuge, related vulnerabilities, mitigation strategies)

Week 5: Memory management-related vulnerabilities and defense (Common memory management errors, buffer overflow, mitigation strategies)

Weeks 6-7: Integer security (Integer vulnerabilities, mitigation strategies) and midterm exam

Weeks 8-9: Formatted output security (Format string vulnerabilities, stack randomization, mitigation strategies)

Week 10: Concurrency and socket security (Race condition vulnerabilities, mitigation strategies, socket security)

Week 11: File I/O security (Access control, managing permissions, mitigation strategies)

Week 12: Best practices in secure programming

Engineering Tools

Throughout the course project and assignments, students will gain experience using various free/open-source software vulnerability (static and dynamic) analysis tools.

Graduate Attributes:

While there are currently no Graduate Attributes for Cybersecurity Engineering undergraduate programs in Canada, the following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of the Cybersecurity Engineering Undergraduate program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating the following graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Attribute 1: Knowledge-base for Engineering. This attribute is covered through learning basic concepts in secure programming. It will be evaluated by exams and assignments/projects, using the following indicators: Indicator 1.3: Knowledge- base in a specific domain.

Attribute 2: Problem analysis. This attribute is covered through the analysis of given scenarios to find the right tools for a practical analysis and security solution. This will be evaluated by assignments/projects, using the following indicator: Indicator 2.1: Problem identification and formulation.

Attribute 3: Use of Engineering tools. This attribute is covered through the identification and use of security vulnerability analysis tools suitable for a given problem/setup. This will be evaluated by assignments/projects, using the following indicators: Indicator 5.1: Ability to use appropriate tools, techniques and resources; Indicator 5.2: Ability to select appropriate tools, techniques, and resources; and Indicator 5.3: Demonstrate awareness of limitations of tools, create and extend tools as necessary.

Attribute 6: Individual and teamwork. This attribute is covered through the successful completion and delivery of group assignments/projects. The following indicators will be used in evaluation: Indicator 6.1: Cooperation and work ethics; and Indicator 6.2: Contribution: practical/conceptual.

Attribute 10: Ethics and equity. This attribute is covered through the understanding of ethical and social issues relate responsible disclosure and bug bounty processes. Current best practices will be discussed. This attribute will be evaluated by assignments/projects, using the following indicator: Indicator 10.1: Professional ethics and accountability.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following concepts in secure programming:

1. Grasp essential secure programming principles, emphasizing the significance of security in software development.
2. Identify and address common vulnerabilities, including string manipulation errors, pointer subterfuge, memory management issues, integer vulnerabilities, and format string vulnerabilities.
3. Apply secure programming principles through practical examples and hands-on exercises, developing problem-solving skills and effective testing strategies.
4. Implement security techniques for formatted output, concurrency, socket operations, and file I/O, covering mitigation strategies and access control measures.
5. Integrate best practices seamlessly into software development, emphasizing security considerations throughout the software development life cycle.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Course number	Course Title	Term
INSE 351	Operating System Security (3 credits)	

Course Instructor	Office	E-Mail	Office Hours

CLASS, LAB, AND TUTORIAL SCHEDULE					
Section	Day	Time	Location	Instructor	E-mail
Lecture					
Tutorial					
Tutorial					
Labs					Lab Start Date
Lab A					
Lab B					
Lab C					
Lab D					
Lab E					

COURSE CALENDAR DESCRIPTION
<p>This course includes topics such as authentication, confidentiality, integrity, access control matrix, safety result, access control list, capability list, Windows security, UNIX/Linux security, security levels, mandatory/discretionary access control, integrity levels, BLP, Biba, conflict of interest, security design principle, password security, strong authentication, dictionary attack, password salt, one-time password, Lamport's scheme, challenge response, logging and auditing, host-based intrusion detection, anomaly detection, misuse detection, memory security, secure booting, UNIX network security services and firewall, covert channel, and information flow control.</p>

PREREQUISITES
INSE 349; COEN 346 or COMP 346

TEXTBOOK AND ADDITIONAL COURSE MATERIALS
<ul style="list-style-type: none"> • <u>Required textbook(s):</u> <ul style="list-style-type: none"> ○ Textbook: Introduction to Computer Security ○ Authors: M.Bishop ○ Publisher: Addison-Wesley (2005) ○ Copies are available at Concordia University bookstore.

- Suggested Textbook:
- Instructor's lecture notes:
Other references will be provided on the class webpage.
- Software Use:

KNOWLEDGE BASE FOR ENGINEERING PREREQUISITES

GRADING POLICY

Evaluation Tool	Weight
Midterm 1	35
Midterm 2	35
ASPEN Project	15
Assignments	10
Tutorials	5
Total	100

Passing Criteria:

- If your total score before the final exam is less than 40% and you decide to defer the final exam, you will receive an **R** grade which prevents you to defer the final exam.
- In order to pass the class, both your cumulative score and the final examination must be above 50%.

GRADUATE ATTRIBUTES: SKILLS TO LEARN AND/OR UTILIZE

Graduate Attribute	Indicators
A knowledge base for engineering	Knowledge base in specific domain (Introduce)
	Knowledge base of natural science (Introduce)
Problem analysis	Problem identification and formulation (Introduce)
	Modelling (Introduce)
	Problem solving (Introduce)
	Analysis (uncertainty and incomplete knowledge) (Introduce)
Design	Define the objective (Introduce)
	Idea generation and selection (Introduce)
	Detailed design (Introduce)
	Validation and implementation (Introduce)
Use of engineering tools	Ability to select appropriate engineering tools, techniques, and resources (Introduce)

Professionalism	Role and responsibilities of the professional engineer (Introduce)
Impact of engineering on society & the environment	Awareness of society and environment (Introduce)
	Sustainability in design (Introduce)
Life-long learning	Identifying missing knowledge and learning opportunities (Introduce)

COURSE LEARNING OUTCOMES (CLOS) <i>By the end of this course students will be able to:</i>	
Course Learning Outcome	Relationship to Graduate Attributes
A. Understand basic operating system security concepts such as security objectives, security threats, security models, security policies, security mechanisms, and human factors	A knowledge base for engineering Knowledge base in specific domain
B. Recognize what security objectives are involved in addressing an operating system security incident and identify the corresponding security threats and human factors that may be involved	Problem analysis Problem identification and formulation Life-long learning Identifying missing knowledge and learning opportunities
C. Understand the security requirements of a given operating system in terms of authentication, access control, logging/auditing, and host-based attack detection, and	A knowledge base for engineering Knowledge base of natural science Problem analysis Problem solving
D. Use security models to formalize the security requirement of a given operating system, and design the corresponding access control mechanisms required for achieving proper levels of security	Problem analysis Modelling Design Detailed design
E. Implement sample operating system kernel-related security attacks and develop corresponding security solutions	Problem analysis Analysis (uncertainty and incomplete knowledge) Design Define the objective Validation and implementation
F. Utilize operating system security tools to perform attack detection and analysis	Use of engineering tools Ability to select appropriate engineering tools, techniques, and resources
G. Identify how professional responsibilities relate to the field of operating system security	Professionalism Role and responsibilities of the professional engineer

H. Identify different strategies to incorporate sustainability into the design of an operating system security solution	Design Idea generation and selection Impact of engineering on society & the environment
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	Awareness of society and environment Sustainability in design
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TENTATIVE COURSE OUTLINE

Topics	Week
Introduction to system security basic concepts.	1
Access Control Matrix and Foundational Results.	2
Access Control Mechanism in UNIX.	3
Security Policies and Confidentiality Policies.	4
Integrity Policies and Hybrid Policies.	5
Midterm 1	6
Design principles and Unix Security.	7
Authentication and Identity.	8
Auditing/Logging and Vulnerability/Defense.	9
Secure Booting/Securing Network Services.	10
Odds and Ends.	11
Midterm 2	12

TERM PROJECT

Topic: Implementing Android attacks and developing defence solutions

OTHER NOTES

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**Concordia Institute for Information Systems Engineering
INSE 390 Cybersecurity Engineering Team Design Project (3 credits)**

Course Instructor:

TBD
[TBD]@concordia.ca

Office Hours:

TBD

Tutorials: Please see the class schedule for details.

Labs: N/A

Course Calendar Description:

Students work in teams to design and implement a cybersecurity project based on requirements provided by the course instructor. Each team will demonstrate the project and prepare adequate documentation for it. In addition, each team will write a report based on the process of development.

Component(s): Lecture 3 hours per week; Tutorial 2 hours per week.

Notes: All written documentation must follow the Concordia Form and Style guide. Students are responsible for obtaining this document before beginning the project.

Prerequisites: INSE 331, INSE 351; ENCS 282; ENGR 371

Co-requisites: INSE 445

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Programming
- Computer architecture and operating systems
- Communication networks and protocols
- Baseline security controls (access control, cryptography, firewalls, etc.)

Course materials

- **Required textbook:** N/A
- **Suggested textbook:** To be determined by the course instructor.

- **Instructor’s lecture notes:** Will be posted on the Moodle course site.
- **Lab manual:** N/A.
- **Software use:** To be determined by the course instructor.

Grading Scheme

Assessment Tool	Weight
Project proposal	20%
Assignments	20%
Final design presentation	30%
Final design documentation	30%

Tentative Course Schedule

Topic(s)	Week
Introduction to projects, team formation, project bidding/assignment, and introduction to Scrum/Agile development	1
Lecture on cybersecurity application design and development	2
Team presentations on project proposals with architectural design	3
Lecture on cybersecurity application validation and deployment; Assignment 1	4
Team presentations on functional requirements and deliverables	5
Lecture on cybersecurity in product lifecycle and supply chain	6
Team presentations on project progress	7
Lecture on usability and human factors in cybersecurity designs; Assignment 2	8
Team presentations on project progress	9
Project demonstrations and feedback	10
Team presentations on project progress	11
Project final presentation and documentation submission	12

Lab Details: N/A

Engineering Tools: N/A

Details on assessment tools:
See under “Grading Scheme”

Other information
N/A

Graduate Attributes

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate Attribute	Indicators	Level of Coverage
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A knowledge base for engineering	<ul style="list-style-type: none"> • Knowledgebase in a specific domain 	Intermediate
Problem analysis	<ul style="list-style-type: none"> • Problem Identification and Formulation • Modeling • Problem Solving • Analysis 	Intermediate
Investigation	<ul style="list-style-type: none"> • Background and hypothesis formulation • Designing experiments • Conducting experiments and collection of data • Analysis and interpretation of data 	Intermediate
Design	<ul style="list-style-type: none"> • Problem identification and information gathering • Idea generation and selection • Detailed design • Validation and implementation 	Advanced
Use of engineering tools	<ul style="list-style-type: none"> • Ability to use appropriate engineering tools and resources • Ability to select appropriate tools, techniques, and resources 	Intermediate
Individual and teamwork	<ul style="list-style-type: none"> • Cooperation and work ethics • Contribution: practical/conceptual • Initiative and leadership • Delivering results 	Intermediate
Communication skills	<ul style="list-style-type: none"> • Documentation • Oral presentation 	Intermediate
Ethics and equity	<ul style="list-style-type: none"> • Professional ethics and accountability • Equity 	Intermediate
Economics and project management	<ul style="list-style-type: none"> • Project planning and implementation 	Intermediate

Course Learning Outcomes (CLOs):

By the end of this semester, successful students can expect to acquire the following skills in cybersecurity:

Course Learning Outcomes	Related Graduate Attributes
Analyze and design a solution for an initially unbound cybersecurity problem with a multidisciplinary nature, based on analysis of use case/requirements and following an iterative concurrent design process.	<ul style="list-style-type: none"> • Background and hypothesis formulation • Problem identification and information gathering • Modeling • Problem solving • Analysis
Implement design ideas and build realistic cybersecurity solutions	<ul style="list-style-type: none"> • Idea generation and selection • Validation and implementation
Survey the available resources for alternative solutions.	<ul style="list-style-type: none"> • Background and hypothesis formulation • Designing experiments • Conducting experiments and collection of

	<ul style="list-style-type: none"> data Analysis and interpretation of data
Complete a design project within a given time frame and budget	<ul style="list-style-type: none"> Detailed design Validation and implementation Project planning and implementation
Effectively select and apply a correct set of components to fulfill a given cybersecurity design.	<ul style="list-style-type: none"> Ability to use appropriate engineering tools and resources Ability to select appropriate tools, techniques, and resources
Execute basic testing, troubleshooting, and integration of the different modules as well as the overall system in cybersecurity applications.	<ul style="list-style-type: none"> Designing experiments Conducting experiments and collection of data Validation and implementation Analysis and interpretation of data
Participate and possibly lead a small cybersecurity team	<ul style="list-style-type: none"> Cooperation and work ethics Initiative and leadership Professional ethics and accountability Equity
Gain confidence in applying technical abilities within a realistic cybersecurity setting.	<ul style="list-style-type: none"> Contribution: practical/conceptual Documentation Oral presentation Delivering results
Prepare and present designed solutions in written documentation (e.g., technical and user manuals) and oral presentations to colleagues and managers.	<ul style="list-style-type: none"> Documentation Oral presentation Delivering results

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: [Safety Programs - Concordia University](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available to Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 401 Usability and Human Aspects of Security (3 credits)**

Course Instructor:

Office Hours:

Tutorials: Please see your class schedule for details

Labs: Please see your class schedule for details

Course Calendar Description:

This course provides students with an introduction to human aspects of security, including common evaluation methodologies for usable security; relationship between usability, deployability, and security; social engineering attacks; user study; statistical analysis for usability measurements; example evaluation of authentication in desktop versus mobile devices, browsers, email applications, and private messaging; and defenses against social engineering attacks.

Prerequisites: INSE 321

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Insert specific knowledge and skills here

N/A

Course materials

Required Textbook: *N/A*

Grading Scheme

1. 15%: Project (may include programming, report writing, in-person presentations)
2. 20%: midterm exam
3. 65%: final exam

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule (subject to modification)

1. Introduction: Usability and human aspects in security
2. Common attacks exploiting human vulnerabilities
3. Common evaluation methodologies for usable security
4. Relationship between usability, deployability, and security (UDS) and how to use it in practice
5. Social engineering attacks
6. User study techniques and pitfalls
7. Statistical analysis for usability measurements
8. Example evaluation of authentication in desktop vs mobile devices, browsers, email applications, and private messaging; Defences against social engineering attacks.

Lab Details

N/A

Engineering Tools

N/A

Details on assessment tools:
See under “Grading Scheme”

Other information

N/A

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of both the Computer Science and Software Engineering program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating five graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Attribute 1: Knowledge-base for Engineering. This attribute is covered through learning basic concepts in cryptography and security, and how to use these concepts in solving (relatively) small, real-world problems. It will be evaluated by exams and assignments/projects, using the following indicators: Indicator 1.1: Knowledge base of mathematics; and Indicator 1.3: Knowledge- base in a specific domain.

Attribute 2: Problem analysis. This attribute is covered through the analysis of given scenarios to find the right tools and primitives for a practical solution. This will be evaluated by assignments/projects, using the following indicator: Indicator 2.1: Problem identification and formulation.

Attribute 3: Use of Engineering tools. This attribute is covered through the identification and use of appropriate cryptographic libraries and security tools for a given problem. This will be evaluated by assignments/projects, using the following indicators: Indicator 5.1: Ability to use appropriate tools, techniques and resources; Indicator 5.2: Ability to select appropriate tools, techniques, and resources; and Indicator 5.3: Demonstrate awareness of limitations of tools, create and extend tools as necessary.

Attribute 6: Individual and team work. This attribute is covered through the successful completion and delivery of group assignments/projects. The following indicators will be used in evaluation: Indicator 6.1: Cooperation and work ethics; and Indicator 6.2: Contribution: practical/conceptual.

Attribute 10: Ethics and equity. This attribute is covered through the understanding of ethical and social issues relate to computer security and privacy. Current best practices for using security tools and application analysis will be discussed. This attribute will be evaluated by assignments/projects, using the following indicator: Indicator 10.1: Professional ethics and accountability.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following engineering concepts.

1. Understanding of usability and HCI, and how human aspects can improve or harm security
2. Understanding usability evaluation techniques
3. Understanding common attacks exploiting human vulnerabilities for various applications
4. Understanding statistical methods for data analysis in user study
5. Understanding defence techniques against social engineering attacks

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 411 Privacy: Enhancing Technologies, Analysis and
Measurement (3 credits)**

Course Instructor:

Jeremy Clark
j.clark@concordia.ca

Office Hours:

Thursday – 14h00 – EV 9.177

Tutorials: Please see your class schedule for details

Labs: Please see your class schedule for details

Course Calendar Description:

This course is on privacy and related concepts like anonymity, confidentiality, and censorship. The following topics will be covered: hashing, bloom filters, encryption, zero-knowledge proofs, multi-party computation, k-anonymity, differential privacy, trusted execution, separation of duties, digital credentials, onion routing, cookies, privacy-preserving data analytics and machine learning, genomic privacy, financial privacy, and secret ballot voting systems.

Prerequisites: INSE 401

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Comfortable reading and understanding small code snippets in an object-oriented programming language
- Comfortable with basic probability theory
- Knowledge of cryptography may be an asset but is not required

Course materials:

- Required Textbook: None
- Lecture Notes/Slides: available on Moodle
- Additional Reading Material: available on Moodle

Grading Scheme:

1.	Midterm Exam:	30%
2.	Final Exam:	40%
3.	Assignment 1:	10%

- | | | |
|----|---------------|-----|
| 4. | Assignment 2: | 10% |
| 5. | Assignment 3: | 10% |

Midterm Makeup: There will be NO makeup for the midterm. In the case of a serious illness or emergency, the weight of the midterm will be moved towards the final exam. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule:

- Week 1: Introductory concepts, ethical basis, misconceptions
- Week 2: Privacy with cryptography (I)
- Week 3: Privacy with cryptography (II)
- Week 4: Privacy with statistics (I)
- Week 5: Privacy with statistics (II)
- Week 6: Privacy with architecture
- Week 7: Privacy with policy
- Week 8: Midterm review and exam
- Week 9: Anonymity, identity and health privacy
- Week 10: Network and web privacy, censorship
- Week 11: Data, learning, and analytics privacy
- Week 12: Privacy in finance and society

Engineering Tools

- Web developer tools in a standard browser
- Mathematical modelling software like Matlab or Mathematica

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Knowledge base for engineering (Applied)

- KB.2 – Comprehends information and applies concepts in mathematics
- KB.7 - Recalls and defines information, first principles and concepts in specialized engineering science
- KB.8 - Comprehends information and applies concepts in specialized engineering science

Problem analysis (Developed)

- PA.1 - Identifies and formulates complex engineering problems
- PA.3 - Analyzes and solves complex engineering problems
- PA.4 - Critically evaluates the validity and accuracy of solutions

Investigation (Introduced)

IN.1 - Conducts planned activities (literature review, experiments, measurements, laboratories, etc.) and analyzes data
IN.2 - Interprets results and reaches valid conclusions regarding complex engineering problems
IN.4 - Understands and/or demonstrates appropriate safety protocols

Design (Introduced)

DE.1 - Understands the problem (open-ended complex engineering problem) and defines objectives and constraints
DE.2 - Develops a design process considering health and safety risks, applicable standards, economic, environmental, cultural and societal considerations.

Use of engineering tools (Introduced)

ET.1 - Selects and uses tools

Professionalism (Introduced)

PR.1 - Understands the role of engineering profession in society
PR.2 - Understands the responsibility of professional engineer in protection of the public and its interest

Impact of engineering on society and the environment (Developed)

IE.1 - Understands the social, environmental, economic, health, safety, legal and/or cultural aspects of engineering activities

Ethics and equity (Introduced)

EE.3 – Understands and/or resolves ethical issues

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following information systems engineering concepts.

- Define and explain foundational concepts like privacy, differential privacy, anonymity, and anonymity sets.
- Compare and differentiate between several fundamental methods for achieving privacy (cryptography, statistics, hardware architectures, laws and policies)
- Conduct measurements about privacy levels
- Understand and articulate the threat model, adversarial assumptions, and consequences of various types of privacy attacks on real-world systems

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Concordia Institute for Information Systems Engineering
INSE 412: Cybercrime and Digital Forensics

Instructor:	Instructor's Name	instructor@ciise.concordia.ca
POD:	POD Name	pod@encs.concordia.ca

Instructors

Lectures

- S. Instructor (Sec. CC, Mondays, Wednesdays, 18:30–21:00, ROOM123-4)

Office hours

Office hours outside of the class time are by appointment. Contact me in class or by email mokhov@ciise.concordia.ca to set one up.

POD

- P. Od (Sec. CC, Tuesdays, Thursdays, 19:00–21:00)
- P. Od (Sec. CC, Mondays, 21:00–23:00)

Course

Description

This course provides students an introduction to cybercrime, including unauthorized access, mischief to data, possession of hacking tools, possession of child pornography, others; legal aspects: Canadian judicial system, computer crime laws, charter of rights, common law, mutual legal assistance treaty, search warrants, production and assistance orders, international laws; investigation process: search planning, acquisition methods, environment recognition, evidence identification; digital forensics: tools, techniques and procedures; reporting process: investigation and analysis reports, note taking; authority of seizure; forensic interviews; computer crime trials: witness preparation, court sentencing, rebuttal witness, cross-examination, testimony, credibility attacks; and in-depth case studies.

Prerequisites INSE 401, INSE 442

Objectives

The course introduces best practices of the industry along with case studies when confronted with computer crimes. Through a practical assessment, we will analyze in great details the Canadian judicial system and how to successfully be recognized as an expert witness and how to give such

a testimony before the court. We will cover the different steps involved in the making of a search warrant and how to handle the evidence gathered following the search. We will address the prominent methods that are used to conduct computer crime investigations. We will see how to involve different partners in an ongoing investigation as well as using the legal methods in place to move your investigation to an international level. We will also study the techniques used in suspect interviews as well as extracting the maximum information from your witnesses. We will study the needed steps to achieve a full investigation report.

Learning Outcomes

This course aims to give students a good grasp of cybercrime investigations, Canadian computer crime laws, and best practices of the industry, presenting a full investigation report and also properly testifying as an expert witness. By the end of the course, the students will learn about:

- Case studies
- Search warrants
- Court testimony
- Investigation steps
- Interview techniques
- Canadian laws and international laws
- Practical and formal aspects of digital forensic investigation and forensic computing

Graduate Attributes

Graduate Attribute	Indicators	Level of Coverage	Assessment Results Reported
Investigation	<ul style="list-style-type: none"> • Background and hypothesis formulation • Designing experiments • Conduction Experiments and collection of data • Analysis and interpretation of data 	Advanced	Yes
Problem Analysis	<ul style="list-style-type: none"> • Problem Identification and Formulation • Modeling • Analysis 	Advanced	Yes
Knowledge base for engineering	Knowledge base in a specific domain	Intermediate	No
Use of engineering tools	Ability to use appropriate engineering tools and resources	Intermediate	Yes
Individual and team work	<ul style="list-style-type: none"> • Cooperation and work ethics • Contribution • Initiative and leadership • Delivering results 	Intermediate	Yes
Communication Skills	<ul style="list-style-type: none"> • Writing process • Oral presentation 	Advanced	Yes

Concordia Institute for Information Systems Engineering INSE 413 Security Auditing and Compliance (3 credits)

Course Instructor:

Dr. Suryadipta Majumdar
suryadipta.majumdar@concordia.ca
Associate Professor (CIISE)

Office Hours:

TBD

Labs: Please see class schedule for details

Lab Demonstrators: *TBD*

Course Calendar Description:

Security auditing and compliance checking have been a popular security practice to ensure the accountability and transparency of a digital system. With the large-scale emerging technologies (including cloud computing, 5G networking, Internet of Things), the landscape of security auditing is rapidly evolving. This course will prepare students with the knowledge of traditional security auditing techniques, as well as cutting-edge techniques for newer technologies. Topics include the definition of security auditing, review of existing security standards, interpreting security standards, formal verification methods and tools, machine-learning based auditing approaches and current challenges in security auditing.

Prerequisites: INSE 331, INSE 351

Co-requisites: INSE 445

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Strong foundations of operating system, programming, network security, operating system security, and cryptography.

Course materials

Required Textbook: *Insert Name, Author(s), Publisher, Edition, Year*

- Instructor's lecture notes: posted on course webpage
- Research articles and industrial whitepapers: mentioned in the lecture notes

Grading Scheme

Midterm Exam	30%
Project	30%
Lab	10%
Final Exam	30%

1. Midterm Exam: First 6 Lectures. Exam date:
2. Project Report: May be done in group of three to four members. Each student is to research, implement, and write a comprehensive report on the topics that will be provided by the instructor. More details about the project will be posted on the course website. Due date:
3. Lab attendance: Four lab sessions will take place. Lab dates:
4. Final Exam: The exam will take place during the examination period at the end of the semester. Students should not make any specific arrangements to leave the city until the final exam date is posted.

Tentative Course Schedule

- Week 1: Course Overview. Why security auditing and compliance?
- Week 2: Definition of Security Auditing
- Week 3: Introduction to Security Standards
- Week 4: Security Standards for emerging technologies (cloud, IoT, 5G)
- Week 5: Interpreting security standards and challenges
- Week 6: Data collection and processing for security auditing
- Week 7: Midterm Exam
- Week 8: Security policies
- Week 9: Formal Verification - I
- Week 10: Formal Verification - II
- Week 11: Machine learning based approaches
- Week 12: Applying security auditing as a proactive solution

Lab Details

There will be four lab sessions with specific assignments:

Task 1: Automatically interpreting security standards using NLP

Task 2: Setting up a formal verification tool (Sugar) and write security policies in formal language (CSP/SAT) (tool

Task 3: Pre-processing system and network logs for auditing using Logstash

Task 4: Verifying three to five security policies related to system and network security using Sugar

Engineering Tools

Formal verification tools (e.g., Sugar), data processing tools (e.g., Logstash), data-centric dashboards (e.g., OpenSearch)

Details on assessment tools: (This section is optional)

Group Project (3-4 members):

Following the entire auditing procedure for clouds:

- Setting up the environment (e.g., OpenStack, Kubernetes)
- Identifying 15-20 security policies from standards
- Interpreting the policies to translate into formal language
- Conducting data collection from the setup
- Deploying formal verification tools (e.g., Sugar)
- Performing security auditing procedure
- Reporting the auditing results

Useful project resources:

<https://users.encs.concordia.ca/%7Emajumdar/papers/tops18-author.pdf>

<https://users.encs.concordia.ca/%7Emajumdar/papers/ndss17-author.pdf>

Other information

TBD

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

- Understanding the terminologies and language of security standards.
- Interpreting security policies.
- Identifying the requirements of security auditing steps.
- Practicing data analysis tools, formal verification tools, and security auditing dashboard
- Outlining security best practices that potentially prevent imminent security threats

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following <program> engineering concepts.

The student should be able to know the detailed procedure of security auditing (intermediary to advanced).

The student should be well educated on the best practices (intermediary to advanced).

The should be able to write automated tools to conduct security auditing steps including data collection, data processing, policy formulation, policy verification, result interpretation (introductory to advanced).

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Concordia Institute for Information Systems Engineering INSE 441 Mobile Security and Privacy (3 credits)

Professor: Chadi Assi
Professor
Office: EV9.179
Phone: (514) 848-2424 x. 5799
Email: chadi.assi@concordia.ca
Office hours: Wednesdays/Fridays 3:00PM – 4:00PM (or by appointment)

1. Course Description

This course provides a comprehensive exploration of the security challenges and solutions within wireless and mobile communication systems. As mobile devices become ubiquitous and play an integral role in our daily lives, securing the communication channels and data they handle is paramount. The course covers a spectrum of topics ranging from the fundamentals of wireless networks to the intricacies of mobile operating systems and applications.

Prerequisites: INSE 349, INSE 445

2. Course Objectives

By the end of this course, students will understand the fundamentals of wireless and mobile networks, including WLANs and cellular networks. Key challenges, threats, and ethical considerations in wireless and mobile security. Analyse security protocols for Wi-Fi and cellular networks. Security architectures of mobile operating systems (Android and iOS). Students will learn secure development practices and code analysis tools in mobile app development. Mobile device management (MDM) solutions and BYOD policies for effective security. Student will learn to implement security measures for mobile device connectivity, including VPNs. Authentication methods such as biometrics and multi-factor authentication and explore emerging trends like 5G, IoT, and the security challenges they present. Ethical hacking practices and responsible disclosure in wireless and mobile security.

Moodle Course website: All the course materials including lecture slides, exercises, announcements, assignments (description and submission) are posted on moodle site ONLY. Check frequently the website for announcements, course material, assignments, etc.

3. Course Organization

3.1 Lectures and Tutorials

The lectures, tutorials and other relevant materials for INSE 425 will be posted on Moodle.

Topics Covered (Tentative):

1. Introduction to Wireless and Mobile networks (2-3 lectures)
 - WLANs (MAC protocols), Mobility management, Mobile IP, Cellular networks (2G, 3G, 4G/LTE and 5G)
2. Overview of Wireless Security (2 lectures)
 - Key Challenges in Wireless and Mobile Security, Mobile Threats and Attack Vectors, Legal and Ethical Considerations in Wireless and Mobile Security
3. Wireless Networks and Protocols (2 lectures)
 - Wireless Security Protocols (WPA, WPA2, WPA3), Securing Wi-Fi Networks: Best Practices, Cellular Network (e.g., 4G and 5G) Security and Authentication
4. Mobile Operating Systems and Architectures (2 lectures)
 - Android and iOS Security Architecture, Comparison of Mobile OS Security Models, Secure Boot and Trusted Execution Environments, Hardening Mobile OS Configurations
5. Mobile App Security (2 lectures)
 - Secure Mobile App Development Practices Code Analysis and Static/Dynamic Analysis Tools, Data Storage Security in Mobile Apps Secure Communication: SSL/TLS, VPNs
6. Mobile Device Management (MDM) and BYOD (2 lectures)
 - Introduction to MDM Solutions, Implementing and Managing BYOD Policies, Remote Wipe and Device Tracking, Containerization for Mobile Security
7. Network Security for Mobile Devices (2 lectures)
 - Mobile Device Connectivity (Wi-Fi, Cellular), Man-in-the-Middle Attacks on Wireless Networks VPNs and Mobile Security, Secure Mobile Browsing and Web Application Security
8. Mobile Authentication and Authorization
 - Biometric Authentication on Mobile Devices, Multi-Factor Authentication, OAuth and OpenID Connect for Mobile Apps, Mobile Device Permissions and Privacy Settings
9. Emerging Trends and Future Challenges
 - 5G and Its Implications on Mobile Security, Internet of Things (IoT) and Wireless Security Wearables and Embedded Devices Security, Ethical Hacking and Responsible Disclosure in Wireless and Mobile Security

3.2 Textbook (References)

- 1) "Network Security Essentials" by William Stallings", 7th Edition by James
- 2) "Wireless Communication Networks and Systems" by Cory Beard and William Stallings
- 3) "Security Vulnerabilities In Mobile Operating Systems"
- 4) "A Comprehensive Guide to 5G Security"

4. Course Evaluation

Lab assignments + Proj.	30%
Midterm Exam	20%
Final Exam	50%

4.1 Assignments + Project

There will be **three** to **four lab** assignments worth up to 15% of your mark. There will also be a project which is worth 15% of your grade.

Policy on late submissions (these rules will be enforced):

You have totally 8 hours of grace period of any late submission of assignments. Beyond 8 hours: One day delay will result in 20% mark reduction. Two days delay will result in 40% mark reduction. After that, the assignment will not be accepted.

4.2 Midterm Exams

There will be one midterm exam worth 20% of your total grade. The date will be determined in class.

4.3 Final Exam

There will be one final exam that is worth 50% of your total grade. The final exam is scheduled by the University. The date and place will be announced later.

5. Graduate Attributes

This course emphasizes and develops the following CEAB (Canadian Engineering Accreditation Board) graduate attributes and indicators:

Graduate Attribute	Indicator	Level of knowledge	CLO	Evaluation Method
A Knowledge-base for Engineering: Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.	KB-3. Knowledge base in a specific domain (ELEC and COEN)	Advanced	all	Assignments, Midterm and Final exams.
Problem Analysis: An ability to use appropriate knowledge and skills to identify, analyze, and solve complex engineering problems in order to reach substantiated conclusions.	PA-1. Problem identification and formulation PA-2. Modelling PA-3. Problem solving PA-4. Analysis (uncertainty and incomplete knowledge)	Advanced	all	Assignments, Midterm and Final exams

6. Academic Honesty

Violation of the Academic Code of Conduct in any form will be severely dealt with. This includes copying (even with modifications) of program segments. You must demonstrate independent thought through your submitted work.

Click on the following link for more information:

<http://www.concordia.ca/students/academic-integrity.html>

Concordia Institute for Information Systems Engineering
INSE 442 Reverse Engineering, Application and Malware Analysis (3 credits)

Professor: Chadi Assi
Professor
Office: EV9.179
Phone: (514) 848-2424 x. 5799
Email: chadi.assi@concordia.ca
Office hours: Wednesdays/Fridays 3:00PM – 4:00PM (or by appointment)

1. Course Description

This course will provide an in-depth exploration of reverse engineering techniques and malware analysis methodologies. Students will learn how to analyze and understand the inner workings of software, detect malicious activities, and develop skills to combat evolving cyber threats.

Prerequisites: INSE 331, INSE 351

2. Course Objectives

Reverse engineering is the process of analyzing hardware or software and understanding it, without having access to the source code or design documents. Malicious actors and hackers often are able to reverse engineer systems and exploit what they find in terms of vulnerabilities. On the other hand, the same techniques can be used by good actors to also discover and thwart these threats. This course goes under the hood of reverse engineering for security analysts, security engineers, and system programmers, so they can learn how to use these same processes to stop hackers in their tracks. Further, Malware/Ransomware analysis has become a big business, and their threats can cost a company dearly. When malware breaches a company's cyber defenses, one needs to act quickly to cure current infections and prevent future ones from occurring. In this course students will learn the tools and techniques used by professional analysts. Students will be able to safely analyze, debug, and disassemble any malicious software that comes your way.

3. Course Organization

Moodle Course Website: All the course materials including lecture slides, exercises, announcements, assignments (description and submission) are posted on Moodle site ONLY. Check frequently the website for announcements, course materials, assignments, etc.

3.1 Lectures and Tutorials

The lectures, tutorials and other relevant materials for INSE 442 will be posted on Moodle.

Topics Covered (Tentative):

1. Introduction to Reverse Engineering
 - Definition and principles of reverse engineering
 - Legal and ethical considerations
 - Tools and environments for reverse engineering
2. Assembly Language Fundamentals

- x86 and x64 assembly basics
- Instruction set architecture
- Disassembly and de-compilation techniques
- 3. Static Analysis Techniques
 - File format analysis (PE, ELF, etc.)
 - Code and data identification
 - Binary code analysis with IDA Pro and Radare2
- 4. Dynamic Analysis Techniques
 - Debugging techniques using WinDbg, GDB, or OllyDbg
 - Runtime analysis and monitoring
 - API hooking and code injection
- 5. Malware Analysis Frameworks
 - Introduction to virtual environments such as Cuckoo Sandbox
 - Automated malware analysis techniques
 - Signature-based and behavior-based analysis
- 6. Malware Functionality Analysis
 - Identifying and analyzing malicious behaviors
 - Code obfuscation and anti-analysis techniques
 - Unpacking and decrypting malware payloads
- 7. Memory Forensics
 - Volatility framework usage
 - Analyzing volatile memory dumps
 - Extracting artifacts and indicators of compromise (IoCs)
- 8. Incident Response and Threat Intelligence
 - Integrating malware analysis into incident response
 - Sharing threat intelligence
 - Case studies of real-world malware incidents
- 9. Advanced Topics
 - Rootkit analysis and detection
 - Mobile malware analysis
 - Firmware and hardware reverse engineering
- 10. Hands-On Projects
 - Reverse engineering exercises
 - Malware analysis projects

3.2 Textbook (References)

- 1) [Michael Sikorski](#) , [Andrew Honig](#) “Practical Malware Analysis: The Hands-On Guide to Dissecting Malicious Software ” 2012
- 2) [Eldad Eilam](#) “Reversing: Secrets of Reverse Engineering” April 15, 2005
- 3) [Bruce Dang](#) , [Alexandre Gazet](#) , [Elias Bachaalany](#) , [Sébastien Josse](#) “Practical Reverse Engineering: x86, x64, ARM, Windows Kernel, Reversing Tools, and Obfuscation” Feb, 2014

4. Course Evaluation

Lab assignments + Proj.	40%
Midterm Exam	20%
Final Exam	40%

4.1 Assignments + Project (tentative)

There will be **three to four lab** assignments worth up to 20% of your mark. There will also be a project which is worth 20% of your grade.

Policy on late submissions (these rules will be enforced):

You have totally 8 hours of grace period of any late submission of assignments. Beyond 8 hours: One day delay will result in 20% mark reduction. Two days delay will result in 40% mark reduction. After that, the assignment will not be accepted.

4.2 Midterm Exams

There will be one midterm exam worth 20% of your total grade. The date will be determined in class.

4.3 Final Exam

There will be one final exam that is worth 40% of your total grade. The final exam is scheduled by the University. The date and place will be announced later.

5. Graduate Attributes

This course emphasizes and develops the following CEAB (Canadian Engineering Accreditation Board) graduate attributes and indicators:

Graduate Attribute	Indicator	Level of knowledge	CLO	Evaluation Method
A Knowledge-base for Engineering: Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.	KB-3. Knowledge base in a specific domain (ELEC and COEN)	Advanced	all	Assignments, Midterm and Final exams.
Problem Analysis: An ability to use appropriate knowledge and skills to identify, analyze, and solve complex engineering problems in order to reach substantiated conclusions.	PA-1. Problem identification and formulation PA-2. Modelling PA-3. Problem solving	Advanced	all	Assignments, Midterm and Final exams

	PA-4. Analysis (uncertainty and incomplete knowledge)			
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6. Academic Honesty

Violation of the Academic Code of Conduct in any form will be severely dealt with. This includes copying (even with modifications) of program segments. You must demonstrate independent thought through your submitted work.

Click on the following link for more information:

<http://www.concordia.ca/students/academic-integrity.html>

Concordia Institute for Information Systems Engineering
INSE 445 Network Security (3 credits)

Course Instructor:

TBD

TBD@concordia.ca**Office Hours:** *TBD***Tutorials:** See the class schedule for details**Labs:** N/A**Course Calendar Description:**

This course will provide students a comprehensive understanding of network security essentials. The covered topics of this course include secure data transmission, web security, domain name system (DNS) protection, wireless network security, denial-of-service (DoS) attacks and mitigation, intrusion detection systems, firewalls, and security for advanced network architectures.

Component(s): Lecture 3 hours per week; Tutorial 1 hours per week.

Prerequisites: INSE 321, INSE 349; COEN 366 or ELEC 366 or COMP 445**Specific Knowledge and Skills Needed for this Course:**

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Communication networks and protocols
- Cryptography
- Programming

Course materials**Required Textbook:**

Cryptography and Network Security: Principles and Practice, Global 8th Edition by William Stallings, Pearson Publishing 2020

Grading Scheme		
Assignments	30%	
Midterm	20%	
Tutorials	10%	
Final Exam	40%	
Tentative Course Schedule		
Topics		Week
Introduction of the course		1
Computer network security concepts		2
Cryptography for network security		3
Public key infrastructure & key management		4
Network security protocols		5
Network vulnerabilities and web security		6
Wireless network security		7
Domain name service security		8
Denial of service attacks and mitigation		9
Access control and user authentication		10
Intrusion detection systems and firewalls		11
Next generation networks security		12
Lab Details		
N/A		
Engineering Tools		
N/A		
Details on assessment tools:		
See under “graduate attributes”		
Other information		
N/A		
Graduate Attributes:		
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.		
Graduate Attribute	Indicators	Level of Coverage
A knowledge base for engineering	Knowledgebase in a specific domain	Intermediate
Problem analysis	Analysis; Problem solving	Intermediate
Design	Design a secure network; Implement a secure network architecture design	
Use of engineering tools	Ability to use appropriate engineering tools and resources	Introductory

Life-long learning	Identify and address educational needs in a changing world	Introductory
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Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following cybersecurity concepts.

Course Learning Outcomes	Related Graduate Attributes
Learn fundamental knowledge in network security	Knowledgebase in a specific domain
Analyze the need of a secure network design and implement such a design conceptually	Analysis; Problem Solving; Design a secure network; Implement a secure network architecture design; Ability to use appropriate engineering tools and resources
Explore the recent technology development in network security	Identify and address educational needs in a changing world

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 452 Penetration Testing and Ethical Hacking (3 credits)**

Course Instructor:

TBD

TBD@concordia.ca**Office Hours:** *TBD***Tutorials:** N/A**Labs:** Please see your class schedule for details**Course Calendar Description:**

Throughout this course, students will develop a comprehensive understanding of cyber attack and defense strategies. The covered topics of this course include system vulnerabilities and exploitation, hacking strategies, cyber attack tools, cybercrime acts, hacking ethics, and malware.

Component(s): Lecture 3 hours per week; lab 1 hours per week.

Prerequisites: INSE 442, INSE 445**Specific Knowledge and Skills Needed for this Course:**

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Fundamental cybersecurity
- Operating systems (Linux and Windows)
- Programming

Course materials

Required Textbook: Hands on Hacking: Become an Expert at Next Gen Penetration Testing and Purple Teaming by Matthew Hickey and Jennifer Arcuri, Wiley 2020

Grading Scheme

Assignments	20%
Labs	30%
Midterm	20%
Final Exam	30%

Tentative Course Schedule

Topics	Week
Introduction to Ethical Hacking and Pentesting	1
Cybersecurity Laws and Hacking Ethics	2
System Vulnerabilities and Hacking Strategies	3
Metasploit + Lab 1 (Metasploit lab)	4
System Hacking + lab 2 (Vulnerability exploitation)	5
Denial of Service and Social Engineering	6
Web Hacking + lab 3 (Web hacking)	7
Evading IDS, Firewalls, and Honeypots + lab 4 (Firewall evasion)	8
Hacking Wireless Networks and Mobile Platforms	9
IoT and Cloud Hacking + lab 5 (IoT hacking)	10
Malware Threats + lab 6 (malware lab)	11
Pentest report writing	12

Lab Details

6 labs are required. See course schedule for details

Engineering Tools

Metasploit; Virtual machines

Details on assessment tools:**Other information:****Graduate Attributes:**

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate Attribute	Indicators	Level of Coverage
A knowledge base for engineering	Knowledgebase in a specific domain	Advanced
Problem analysis	Problem Identification; Analysis; Problem solving	Intermediate
Investigation	Conduct a series of experiments to identify the problem; Analysis and interpretation of data	Intermediate

Use of engineering tools	Ability to use appropriate engineering tools and resources; Ability to select	Intermediate
	appropriate tools, techniques, and resources	
Ethics and equity	Professional ethics and accountability	Intermediate
Professionalism	Responsibility of the role; Protection of the public	Intermediate
Communication skills	Pentest report writing	Intermediate

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following cybersecurity concepts.

Course Learning Outcomes	Related Graduate Attributes
Learn fundamental knowledge in penetrations testing and ethical hacking	Knowledgebase in a specific domain
Master some pentesting tools and learn how to use them to conduct hacking	Ability to use appropriate engineering tools and resources; Ability to select appropriate tools, techniques, and resources
Learn how to strategically conduct pentests to identify vulnerabilities and write a report on the results	Conduct a series of experiments to identify the problem; Analysis and interpretation of data; Problem Identification; Analysis; Problem solving; Pentest report writing
Learn what is professionalism in pentesting	Professional ethics and accountability; Responsibility of the role; Protection of the public

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 481 Blockchain Technologies and Applications (3 credits)**

Course Instructor:

Jeremy Clark
j.clark@concordia.ca

Office Hours:

Thursday – 14h00 – EV 9.177

Tutorials: Please see your class schedule for details

Labs: Please see your class schedule for details

Course Calendar Description:

This course deals with Bitcoin and blockchain technologies, and includes topics such as: digital cash, hash functions, digital signatures, Merkle trees, linked time-stamping, blockchains, Bitcoin, Ethereum, smart contracts, and Solidity FinTech.

Prerequisites: *N/A*

Co-requisites: *N/A*

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Comfortable reading and understanding small code snippets in an object-oriented programming language
- Comfortable coding short programs in an object-oriented programming language
- Knowledge of cryptography may be an asset but is not required

Course materials

Required Textbook: Narayanan et al., Bitcoin and Cryptocurrency Technologies, Princeton University Press (2016)

Grading Scheme:

- | | |
|------------------|-----|
| 1. Midterm Exam: | 30% |
| 2. Final Exam: | 40% |
| 3. Assignment 1: | 10% |
| 4. Assignment 2: | 10% |
| 5. Assignment 3: | 10% |

Midterm Makeup: There will be NO makeup for the midterm. In the case of a serious illness or emergency, the weight of the midterm will be moved towards the final exam. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule

Week 1: Course overview
Week 2: Crypto I: Hash functions
Week 3: Crypto II: Digital signatures
Week 4: Crypto III: Commitments, accumulators, proof of work, time-stamping
Week 5: Blockchain: Consensus and sybil-resistance
Week 6: Bitcoin I: Details.
Week 7: Bitcoin II: Details.
Week 8: Midterm (in class).
Week 9: Ethereum I: Details.
Week 10: Ethereum II: Programming smart contracts, Solidity.
Week 11: Applications to finance
Week 12: Extensions to base technology

Engineering Tools

Developer software and tools: Students may benefit from learning how to use various developer tools such as Remix, Truffle, Ganache, and VS Code (or VSCodium).

Programming languages: Students will need to learn how to use programming languages such as Solidity for developing secure smart contracts.

Web3 interfaces: Students will need to learn to use wallet software, such as MetaMask, and may benefit from learning web3 development.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Knowledge base for engineering (Applied/Advance)

- KB.1 - Recalls and defines information and concepts in mathematics
- KB.2 – Comprehends information and applies concepts in mathematics
- KB.7 - Recalls and defines information, first principles and concepts in specialized engineering science
- KB.8 - Comprehends information and applies concepts in specialized engineering science

Problem analysis (Developed/Intermediate)

- PA.1 - Identifies and formulates complex engineering problems
- PA.2 - Develops models from first principles to analyze complex engineering problems
- PA.3 - Analyzes and solves complex engineering problems
- PA.4 - Critically evaluates the validity and accuracy of solutions

Investigation (Introduced/Introductory)

IN.1 - Conducts planned activities (literature review, experiments, measurements, laboratories, etc.) and analyzes data

Design (Introduced/Introductory)

DE.1 - Understands the problem (open-ended complex engineering problem) and defines objectives and constraints

Use of engineering tools (Developed/Intermediate)

ET.1 - Selects and uses tools

Communication skills (Introduced/Introductory)

CS.1 - Understands, interprets and/or assesses oral, written, graphical or visual communications

CS.2 - Produces written engineering reports and design documentation

Impact of engineering on society and the environment (Introduced/Introductory)

IE.1 - Understands the social, environmental, economic, health, safety, legal and/or cultural aspects of engineering activities

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following information systems engineering concepts.

- Define and explain the fundamental cryptographic building blocks that compose to allow Nakamoto consensus and the blockchain data structure.
- Develop, implement, and deploy a smart contract to live blockchain network such as Ethereum's current testnet.
- Conduct measurements about blockchain transactions, consumption of gas and other fees, data size of contracts and transactions, and trace transactions through block explorer tools.
- Understand and articulate the threat model, adversarial assumptions, and consequences of various types of security attacks on a blockchain system.
- Communicate effectively about security vulnerabilities in smart contracts whether at the level of the code, the functionality of the contract, the composition of multiple contracts or the incentives governing participants.
- Think creatively about blockchain use-cases and articulate when blockchains provide useful properties relative to simpler alternatives like a centralized database.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Course number	Course Title	Term
INSE 482	Industrial Control Systems and Critical Infrastructure Security	

Course Instructor	Office	E-Mail	Office Hours
Walter Lucia	EV 9.185	walter.lucia@concordia.ca	

CLASS, LAB, AND TUTORIAL SCHEDULE					
Section	Day	Time	Location	Instructor	E-mail
Lecture					
Tutorial					
Tutorial					
Labs					Lab Start Date
Lab A					
Lab B					
Lab C					
Lab D					
Lab E					

COURSE CALENDAR DESCRIPTION
<p>This introductory course provides fundamental notions of feedback control systems and cyber-physical systems (CPSs) and how such systems are used to control critical industrial control systems and infrastructures. Students will learn the basics of how to reproduce feedback and networked control systems in a simulation environment and how to analyze their performance. The potential vulnerability of autonomous critical infrastructure to cyber-attacks is explored, and classes of attacks affecting the security and privacy of such systems are investigated. Students will learn how to emulate the presence of attacks in a simulation environment with the aim of testing their impact on control systems and critical infrastructures. Passive and active mechanisms for the detection and mitigation of cyber-attacks are investigated, and the concept of secure and resilient control is introduced. An introduction to the engineering software Matlab/Simulink will be provided, with particular emphasis on how such tools can be used to design cyber-secure industrial control systems for critical infrastructures.</p>

PREREQUISITES

TEXTBOOK AND ADDITIONAL COURSE MATERIALS

- Suggested textbook(s):
 - Rajeev Alur (2023). Principles of Cyber-Physical Systems, MIT Press Bookstore, ISBN 9780262548922

- Instructor's lecture notes: provided on Moodle.
- Software Use: Matlab

KNOWLEDGE BASE FOR ENGINEERING PREREQUISITES

GRADING POLICY

Evaluation Tool	Weight
Midterm	35
Assignments	15
Tutorials	15
Final Exam	35
Total	100

Passing Criteria:

- If your total score before the final exam is less than 30% and you decide to defer the final exam, you will receive an **R** grade which prevents you to defer the final exam.
- In order to pass the class, both your cumulative score and the final examination must be above 50%.

GRADUATE ATTRIBUTES: SKILLS TO LEARN AND/OR UTILIZE

Graduate Attribute	Indicators
Problem analysis	Problem identification and formulation (Intermediate)
	Modelling (Intermediate)
	Problem solving (Intermediate)
	Analysis (Intermediate)
Investigation	Background and hypothesis formulation (Intermediate)
	Designing experiments and collection of data (Intermediate)
	Analysis and interpretation of data (Intermediate)
Use of engineering tools	Ability to use appropriate tools, techniques, and resources (Intermediate)
	Demonstrate awareness of limitations of tools, create and extend tools as necessary (Intermediate)

COURSE LEARNING OUTCOMES (CLOS)

By the end of this course students will be able to:

Course Learning Outcome	Relationship to Graduate Attributes
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A. Model critical infrastructures as feedback control systems/cyber-physical systems	Problem analysis Modelling
B. Determine the stability and performance of control systems	Problem analysis Problem identification and formulation Analysis Investigation Background and hypothesis formulation
C. Assess the class of cyber-attacks that could affect networked cyber-physical systems and their impact	Problem analysis Problem identification and formulation Investigation Background and hypothesis formulation
D. Reproduce in a simulation environment cyber-physical system and the presence/effect of cyber-attacks	Use of engineering tools Modelling Investigation Designing experiments and collection of data Analysis and interpretation of data Use of engineering tools Ability to use appropriate tools, techniques, and resources Demonstrate awareness of limitations of tools, create and extend tools as necessary
E. Design basic anomaly detector and mitigation strategies against cyber-attacks for industrial control systems	Problem analysis Problem Solving Design Analysis (uncertainty and incomplete knowledge) Investigation Analysis and interpretation of data Use of engineering tools Ability to use appropriate tools, techniques, and resources. Demonstrate awareness of limitations of tools, create and extend tools as necessary.

TENTATIVE COURSE OUTLINE	
Topics	Week

Introduction to feedback control systems	1
Introduction to networked control systems and cyber-physical systems	2
Industrial control systems modeling and control systems for critical infrastructure	3
Mathematical modeling of critical infrastructures as cyber-physical systems	4
Basic design principles for control systems and performance criteria	5
Security and privacy concepts for automated critical infrastructures	6
Classes of cyber-attack potentially targeting control systems and critical infrastructures	7
Modelling and representation of cyber-physical systems and cyber-attacks in simulation environment using Matlab/Simulink	8
Control system performance analysis under cyber-attacks	9
Design criteria to ensure safety and security of cyber-physical systems against cyber-attacks	10
Introduction to the design of anomaly detectors for industrial control systems	11
Introduction to the design of resilient control solutions against cyber-attacks	12

**Concordia Institute for Information Systems Engineering
INSE 483 IoT and Embedded System Security (3 credits)**

Course Instructor: Mohsen Ghafouri (Ghafouri@encs.concordia.ca)

Office Hours:

Wednesdays, from 11:30 AM to 1:30 PM
EV building room 3.117

Tutorials: Please see your class schedule for details

Tutors: *insert tutor name(s)*

Labs: Please see your class schedule for details

Lab Demonstrators: *insert name(s)*

Course Calendar Description:

This course initially provides an introduction to the concept of security and its basic definitions, proceeding with the concept of embedded systems, their application and characteristics. Then, it delves into the famous attacks, lessons learned, and common vulnerabilities and attack in general, and in cases of different domains, such as industrial control systems. We will describe the details inside embedded systems, such as their IO, operating system, communication, etc. Finally, we provide security analysis frameworks and monitoring techniques.

Prerequisites: N/A

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Fundamentals of security and definitions, specification and application of IoT devices and embedded systems, foundations for cyber-physical systems. Embedded HW architectures, sensors, actuators, processors, IO and peripherals, memory architectures, interfacing memory and peripheral, embedded system testing, and operating systems.

Course materials

Required Textbook: *Insert Name, Author(s), Publisher, Edition, Year*

- 1- Giancarlo Fortino, Carlos E. Palau, Antonio Guerrieri, Nora Cuppens, Frédéric Cuppens, Hakima Chaouchi, Alban Gabillon, “Interoperability, Safety and Security in IoT” Publisher: Springer International Publishing, Year: 2018
- 2- Shancang Li and Li Da Xu “Securing the Internet of Things” Syngress , Year: 2017
- 3- Catherine H. Gebotys “Security in Embedded Devices” Springer US, Year: 2010
- 4- Bovino, C., Morandi, M. (2015). IoT and embedded systems security. Switzerland: Scuola universitaria professionale della Svizzera italiana.

Grading Scheme

The weight distribution may subject to changes upon notice.

- Midterm: 25%
- Assignment: 30%
- Final exam: 45%

In order to pass the class, both your cumulative score and the final examination must be above 50%

Tentative Course Schedule

Insert course schedule here

1. Introduction to security
2. Introduction to embedded systems
3. Embedded system applications
4. Risk and steps to ensure embedded system security
5. Cryptography and safety tests
6. Examples of security in embedded systems
7. Internal structure of embedded systems
8. midterm
9. Input and outputs, security and privacy concerns
10. Operating systems
11. Embedded systems and networks
12. Detection and mitigation of threats
13. Best practices to avoid security concerns

Lab Details

You may include a list of lab trainings and names of experiments here.

NA

Engineering Tools

Insert engineering tools introduced/utilized in the course here.

Microprocessors, programming

Details on assessment tools:

The course includes 4 assignments each has 10% of the total grades. It

Other information

Any form of cheating, plagiarism, personation, and falsification of a document as well as any other form of dishonest behaviour related to the obtention of academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and may lead to severe penalties up to and including suspension and expulsion.

As examples only, you are not permitted to:

- Copy from anywhere without indicating where it came from
- Let another student copy your work and then submit it as his/her own
- Hand in the same assignment in more than one class
- Have unauthorized material or devices in an exam. Note that you do not have to be caught using them – just having them is an offence

- Copy from someone's else exam
- Communicate with another student during an exam
- Add/remove pages from an examination booklet or take the booklet out of an exam room
- Acquire exam or assignment answers or questions
- Write an exam for someone else or have someone write an exam for you
- Submit false documents such as medical notes or student records
- Falsify data or research results

You are subject to the Academic Code of Conduct. Take the time to learn more at:
<http://provost.concordia.ca/academicintegrity/>

Students are expected to attend every class. Some material may only be covered in class and not made available on the course website. Students are expected to read the assigned material and to actively participate in class discussions.

- Students are expected to be respectful of other people's opinions and to express their own views in a calm and reasonable way. Disruptive behaviour will not be tolerated.
- Students are expected to be familiar with the Code of Rights and Responsibilities:
<http://rights.concordia.ca>

- Concordia Counselling and Development offers career services, psychological services, student learning services, etc.

<http://cdev.concordia.ca>

- The Concordia Library Citation and Cycle Guides:

<http://library.concordia.ca/help/howto/citations.html>

- Advocacy and Support Services:

<http://supportservices.concordia.ca>

- Student Transition Centre:

<http://stc.concordia.ca>

- New Student Program:

<http://newstudent.concordia.ca>

- Office for Students with Disabilities:

<http://supportservices.concordia.ca/disabilities>

- The Academic Integrity Website:

<http://provost.concordia.ca/academicintegrity>

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Insert graduate attributes here

Graduate attribute	Indicator	Level of knowledge
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KB - A knowledge base for engineering	<ul style="list-style-type: none"> • Knowledge base in a specific domain 	Advanced
UET - Use of engineering tools	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources • Demonstrate awareness of limitations of tools, create and extend tools as necessary 	Intermediate
DE – Design	<ul style="list-style-type: none"> • Define the objective • Idea generation and selection • Detailed design • Validation and implementation 	Intermediate
CO- Communication Skills	<ul style="list-style-type: none"> • Documentation 	Intermediate
PA-Problem analysis	<ul style="list-style-type: none"> • Problem Identification and Formulation • Problem Solving • Analysis 	Intermediate

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following <program> engineering concepts.

Upon completion of this course, students will have gained a thorough understanding of embedded systems, their security aspects, and how these security elements influence different applications. Additionally, they will be equipped to apply this knowledge in a practical project setting. The course curriculum includes the following topics:

- Fundamental concepts of cyber security, including key terms and definitions.
- The significance of security in embedded systems, with relevant examples.
- Security testing in embedded systems, including hazard identification and risk assessment.
- Overview of notable cyber attacks and common entry points for attackers.
- The role of processors and computing within embedded systems.
- Issues related to connections, security, and timing in embedded systems.
- Various communication channels and their mediums in embedded systems.
- Examination of a realistic cyber attack scenario.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 484 Quantum Computing and Security (3 credits)**

Course Instructor:

Amr Youssef
amr.youssef@concordia.ca

Office Hours:

Monday 10:0 am-11:30 am

Tutorials: Please see your class schedule for details

Tutors: TBA

Labs: N/A

Course Calendar Description:

This course covers quantum mechanics (photon polarization, linear polarization, circular and elliptical polarization, general quantum variables, composite systems, measuring a subsystem, other incomplete measurements); quantum cryptography (the Bennett-Brassard protocol, the no-cloning theorem, quantum teleportation); error-correcting codes (linear codes, syndrome decoding); error correction for quantum key distribution, privacy amplification, quantum computing (quantum gates, the Deutsch Algorithm, universal set of quantum gates); Shor's algorithm (finding the period of $f(x)$, estimating the probability of success, efficiency of factoring); post quantum cryptography.

Prerequisites: N/A

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics:
Linear Algebra, Basic Number Theory

Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Specific knowledge and skills:

N/A

Course materials

Optional Textbooks:

Nielsen, Michael A., and Isaac L. Chuang. Quantum computation and quantum information. Cambridge university press, 2010.

Vidick, Thomas, and Stephanie Wehner. Introduction to quantum cryptography. Cambridge University Press, 2023.

Grading Scheme

50%: Final exam
25%: Midterm exam
10%: Assignments
15%: Project

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule

Week 1-3: Introduction to Quantum Mechanics (Photon Polarization, Linear polarization, Circular and elliptical polarization, General Quantum Variables, Composite Systems, Measuring a Subsystem, Other Incomplete Measurements)

Week 4-5: Quantum Cryptography (The Bennett–Brassard Protocol, The No-Cloning Theorem, Quantum Teleportation)

Week 6: Introduction to Error-Correcting Codes (Linear Codes, Syndrome Decoding)

Week 7: Error Correction for Quantum Key Distribution, Privacy Amplification

Week 8: Quantum Computing (Quantum Gates, The Deutsch Algorithm, Universal Set of Quantum Gates)

Week 9-10: Number Theory for Shor's Algorithm, Finding the Period of $f(x)$, Estimating the Probability of Success, Efficiency of Factoring

Week 11-12: Post Quantum Cryptography

Lab Details

N/A

Engineering Tools

Qiskit (Quantum Information Science Kit): Qiskit is an open-source quantum computing SDK developed by IBM. It allows users to write quantum algorithms using Python and run them on IBM's quantum processors or simulators.

<https://qiskit.org>

Details on assessment tools:

Project description: All proposed projects must include a practical implementation component. Projects based solely on paper surveys will not be accepted

Other information

N/A

Graduate Attributes:

While there are currently no Graduate Attributes for Cybersecurity Engineering undergraduate programs in Canada, the following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of the Cybersecurity Engineering Undergraduate program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating the following graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Attribute 1: Knowledge-base for Engineering. *This attribute is covered through learning basic concepts in Quantum Computing, and how to use these concepts in solving the Integer Factorization problem. It will be evaluated by exams and assignments/ projects, using the following indicators: Indicator 1.1: Knowledge base of mathematics; and Indicator 1.3: Knowledge- base in a specific domain.*

Attribute 2: Problem analysis. *This attribute is covered through the analysis of given scenarios to find the right tools and primitives for a practical solution. This will be evaluated by assignments/projects, using the following indicator: Indicator 2.1: Problem identification and formulation.*

Attribute 3: Use of Engineering tools. *This attribute is covered through the identification and use of Qskit (Quantum Information Science Kit) and appropriate post quantum cryptography libraries for a given problem. This will be evaluated by assignments/projects, using the following indicators: Indicator 5.1: Ability to use appropriate tools, techniques and resources; Indicator 5.2: Ability to select appropriate tools, techniques, and resources; and Indicator 5.3: Demonstrate awareness of limitations of tools, create and extend tools as necessary.*

Attribute 6: Individual and teamwork. *This attribute is covered through the successful completion and delivery of group assignments/projects. The following indicators will be used in evaluation: Indicator 6.1: Cooperation and work ethics; and Indicator 6.2: Contribution: practical/conceptual.*

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to achieve the following:

1. Understand core principles in quantum mechanics, covering topics like photon polarization and measuring subsystems.
2. Gain basic proficiency in quantum cryptography, including the Bennett–Brassard Protocol, the No-Cloning Theorem, and Quantum Teleportation.
Quantum Computing Basics
3. Develop a working knowledge of quantum computing essentials, such as quantum gates, the Deutsch Algorithm, and the universal set of quantum gates.
4. Apply theoretical concepts to practical problem-solving, especially in error correction for quantum key distribution, and collaborate effectively in implementing quantum algorithms and cryptographic protocols.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 485 Cybersecurity of Healthcare Systems and Devices (3 credits)**

Course Instructor:

instructor
instructor@ciise.concordia.ca

Office Hours:

Insert office hours Days – Time – Location here

Course Calendar Description:

This course offers an in-depth look into the unique challenges and methodologies associated with securing healthcare systems and devices. It covers a range of topics including the architecture of healthcare IT systems, data privacy laws, the security of medical devices, and strategies to mitigate cybersecurity threats in healthcare. This course combines theoretical learning with practical case studies to prepare students for careers in healthcare cybersecurity.

Course Objectives:

- *Understand the structure and vulnerabilities of healthcare IT systems.*
- *Develop strategies for securing medical devices and electronic health records.*
- *Analyze case studies on healthcare cybersecurity breaches and learn from them.*
- *Familiarize with laws and regulations governing data privacy in healthcare.*

Prerequisites: N/A

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Below is a list of useful knowledge topics that students should have familiarity before enrolling. The following topics provide a foundational understanding necessary for comprehending the course material effectively. (1) Basic Principles of Cybersecurity: Understanding of fundamental cybersecurity concepts such as confidentiality, integrity, and availability (CIA triad). Familiarity with common types of cyber threats (e.g., malware, phishing, ransomware) and basic defensive measures; (2) Fundamentals of Networking: Knowledge of network architecture, including the roles of routers, switches, and other networking devices, is beneficial. Additionally, familiarity with network protocols (e.g., TCP/IP) and common network services (e.g., DNS, HTTP/S) are helpful; (3) Information Systems and Data Protection: Understanding of information systems and the importance of protecting data, especially personal and sensitive information. Basic knowledge of data encryption techniques and secure data storage practices.

Course materials

Required Textbook: *Insert Name, Author(s), Publisher, Edition, Year*

Course Materials:

1. A. Wirth, C. Gates, J. Smith, "Medical Device Cybersecurity for Engineers and Manufacturers," Norwood, MA Artech House, 2020.
2. L. Ayala, "Cybersecurity for Hospitals and Healthcare Facilities," Berkeley, CA. 2016.
3. M.S. Obaidat, I. Traore, I. Woungang, "Biometric-based Physical and Cybersecurity Systems," Springer International Publishing, 2019.
4. L. Coventry, D. Branley, "Cybersecurity in Healthcare: A Narrative Review of Trends, Threats and Ways Forward," *Maturitas*, vol. 1, no. 13, pp. 113:48-52, 2018.
5. C.S. Kruse, B. Frederick, T. Jacobson, D.K. Monticone, "Cybersecurity in Healthcare: A Systematic Review of Modern Threats and Trends," *Technology and Health Care*, vol. 25, no. 1, 2017.
6. S. Gerke, T. Minssen, G. Cohen, "Ethical and Legal Challenges of Artificial Intelligence-Driven Healthcare," *Artificial Intelligence in Healthcare*, pp. 295-336, 2020.
7. N.M. Thomasian, E.Y. Adashi, "Cybersecurity in the Internet of Medical Things," *Health Policy and Technology*. Vol. 10, no. 3, 2021.
8. P.A. Williams, A.J. Woodward, "Cybersecurity Vulnerabilities in Medical Devices: A Complex Environment and Multifaceted Problem," *Medical Devices: Evidence and Research*. Vol. 20, 2015.
9. A.J. Coronado, T.L. Wong, "Healthcare Cybersecurity Risk Management: Keys to an Effective Plan," *Biomedical Instrumentation & Technology*, pp. 26-30, 2014.
10. S.T. Argaw et al., "Cybersecurity of Hospitals: Discussing the Challenges and Working Towards Mitigating the Risks," *BMC Medical Informatics & Decision Making*, 2020.

Grading Scheme

- Midterm Exam (20%)
- Group Project (40%): Analysis and presentation of a recent cybersecurity incident in healthcare.
- Final Exam (40%)

Tentative Course Schedule

- Week 1: Introduction to Healthcare IT Systems
- Week 2: Data Privacy and Security Laws (HIPAA, GDPR, etc.)
- Week 3: Cybersecurity Threats to Healthcare Systems
- Week 4: Security of Medical Devices
- Week 5: Healthcare Cybersecurity Risk Management and Mitigation Strategies
- Week 6: Security of Artificial Intelligence-Driven Healthcare
- Week 7: Cyber Attack Modeling, Detection, and Mitigation
- Week 8: Biometric-based Cybersecurity Systems,
- Week 9: Cybersecurity of the Internet of Medical Things
- Week 10: Incident Response and Disaster Recovery in Healthcare
- Week 11: Emerging Trends in Healthcare Cybersecurity
- Week 12: Case Studies of Healthcare Cybersecurity Breaches

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

<i>Graduate Attribute</i>	<i>Indicators</i>	<i>Level of Coverage</i>	<i>Assessment Results Reported</i>
<i>Investigation</i>	<ul style="list-style-type: none"> • <i>Background and hypothesis formulation</i> • <i>Designing experiments</i> • <i>Conduction Experiments and collection of data</i> • <i>Analysis and interpretation of data</i> 	<i>Advanced</i>	<i>Yes</i>
<i>Problem Analysis</i>	<ul style="list-style-type: none"> • <i>Problem Identification and Formulation</i> • <i>Modeling</i> • <i>Analysis</i> 	<i>Advanced</i>	<i>Yes</i>
<i>Knowledge base for engineering</i>	<i>Knowledge base in a specific domain</i>	<i>Intermediate</i>	<i>Yes</i>
<i>Use of engineering tools</i>	<i>Ability to use appropriate engineering tools and resources</i>	<i>Intermediate</i>	<i>Yes</i>
<i>Individual and team work</i>	<ul style="list-style-type: none"> • <i>Cooperation and work ethics</i> • <i>Contribution</i> • <i>Initiative and leadership</i> • <i>Delivering results</i> 	<i>Advanced</i>	<i>Yes</i>

<i>Communication Skills</i>	<ul style="list-style-type: none"> • <i>Writing process</i> • <i>Oral presentation</i> 	<i>Advanced</i>	<i>Yes</i>
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Course Learning Outcomes (CLOs):

By the end of this course, students will:

- *Have a comprehensive understanding of cybersecurity principles as they apply to healthcare systems and devices.*
- *Be able to identify and assess potential security threats in healthcare IT environments.*
- *Understand the legal and ethical implications of data security in healthcare.*
- *Be equipped to contribute to the development and implementation of cybersecurity measures in healthcare settings.*

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 486 Cybersecurity Management and Governance (3 credits)**

Course Instructor:*Serguei Mokhov**Insert e-mail address here*[You may include more information about the course instructor.](#)**Office Hours:***Insert office hours Days – Time – Location here***Course Calendar Description:**

This course covers topics of cybersecurity management, governance and best practices in small, medium and large organizations of various types (public, private, non-profit, startup). This includes cybersecurity and privacy policies and compliance; authentication authorization, and access control; backups; audits; monitoring and penetration testing; scheduled maintenance and patching; secure and agile software development (security by design), deployment, configuration, and maintenance; reporting responsible disclosure of breaches and vulnerabilities; incident management and response; cybersecurity organization structure; cybersecurity education (anti-phishing, ransomware) and communications; technological and legal frameworks; and government cybersecurity laws and regulations in Quebec, Canada, and world-wide.

Prerequisites: N/A**Co-requisites:** N/A**Specific Knowledge and Skills Needed for this Course:**

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Insert specific knowledge and skills here:

- *Policies, laws, regulations, and compliance requirements*
- *Risk assessment*
- *Insider threats*
- *Advanced persistent threats and threat landscape*
- *Managing cybersecurity best practices in an organization*
- *Maintenance cycles and updates of software, hardware*
- *Supporting cybersecurity decision making*
- *Managing incidents and incident response*
- *Secure software development by design best practices*
- *Organization's members education and training in prevention of cyberthreats*
- *Mitigation of vulnerabilities*
- *Responsible disclosure*

Course materials**Required Textbook:** N/A

- *Introduction to Cybersecurity Governance for Business Technology Management, Marc-André Léger*
- *Cybersecurity Governance, CISA.gov*
- *NIST*
- *Canadian and Quebec Government Frameworks*
- *TBD*

Grading Scheme

- *20% midterm quiz*
- *30% final quiz*
- *50% project*

Students must pass 50% on each component to pass the course.

Tentative Course Schedule

Week	Tentative topic
1	Course introduction Introduction to cybersecurity governance Selection of project teams
2	Government laws, regulations; Compliance; Legal frameworks
3	Identifying and securing digital assets; Risk assessment and management; Monitoring
4	Monthly maintenance and patch management; auditing
5	Secure software development by design; including agile
6	Midterm quiz
7	Mid-term break
8	Organizational cybersecurity structure; end user an executive education
9	Incident detection and response; responsible disclosure and reporting
10	Advanced persistent threats and their mitigation; phishing; ransomware
11	Final quiz
12	Project presentations

Details on assessment tools:

Quizzes will assess the students grasp on the materials covered; no memorization will be required; case analysis.

Projects will cover surveys on the course topics or in-depth case studies from one or more organizations and their cybersecurity management and governance.

Other information

Industry practitioners will be invited to give guest lectures on the topics of the course; subject to availability.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

<i>Graduate Attribute</i>	<i>Indicators</i>
<i>Problem analysis</i>	<ul style="list-style-type: none"> ● <i>Problem identification and formulation (intermediate)</i> ● <i>Analysis (intermediate)</i> ● <i>Problem solving (intermediate)</i>
<i>Design</i>	<ul style="list-style-type: none"> ● <i>Define the objective (intermediate)</i> ● <i>Validation and implementation (intermediate)</i>
<i>Individual and team work</i>	<ul style="list-style-type: none"> ● <i>Cooperation and work ethics (intermediate)</i> ● <i>Initiative and leadership (intermediate)</i> ● <i>Delivering results (intermediate)</i>
<i>Communications skills</i>	<ul style="list-style-type: none"> ● <i>Writing process (intermediate)</i> ● <i>Oral presentation (advanced)</i>
<i>Professionalism</i>	<ul style="list-style-type: none"> ● <i>TBD</i>
<i>Economics and project management</i>	<ul style="list-style-type: none"> ● <i>TBD</i>
<i>Life-long learning</i>	<ul style="list-style-type: none"> ● <i>Identifying missing knowledge and learning opportunities (intermediate)</i>

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following **Cybersecurity Program's** engineering concepts.

Course Learning Outcome	Relationship to Graduate Attributes
<i>Identify core digital assets and devise their protection strategies</i>	<ul style="list-style-type: none"> ● <i>Problem identification and formulation</i> ● <i>Analysis</i>
<i>Devise or update an organization policy in the current cybersecurity threat landscape</i>	<ul style="list-style-type: none"> ● <i>Writing process</i> ● <i>Oral presentation</i>
<i>Enforce compliance</i>	<ul style="list-style-type: none"> ● <i>Cooperation and work ethics</i> ● <i>Initiative and leadership</i> ● <i>Delivering results</i>
<i>Plan employee training</i>	<ul style="list-style-type: none"> ● <i>Initiative and leadership</i> ● <i>Life-long learning</i>
<i>Assess risks and attack surface</i>	<ul style="list-style-type: none"> ● <i>Problem identification and formulation</i> ● <i>Analysis</i>
<i>Implement best cybersecurity practices for software systems deployment and maintenance</i>	<ul style="list-style-type: none"> ● <i>Delivering results</i>
<i>Implement a policy for secure by design software development and maintenance</i>	<ul style="list-style-type: none"> ● <i>Define the objective</i> ● <i>Validation and implementation</i>
<i>Regularly review local and global government regulations wrt security, privacy, and compliance</i>	<ul style="list-style-type: none"> ● <i>Initiative and leadership</i> ● <i>Life-long learning</i>
<i>Devise backup and retention strategies</i>	<ul style="list-style-type: none"> ● <i>Define the objective</i> ● <i>Validation and implementation</i>
<i>Have checklists in place for detection, response, disclosure and reporting of cybersecurity incidents</i>	<ul style="list-style-type: none"> ● <i>Define the objective (intermediate)</i> ● <i>Validation and implementation</i>

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University](https://www.concordia.ca/campus-life/safety/general-safety.html)

(<https://www.concordia.ca/campus-life/safety/general-safety.html>)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available to Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 490 Capstone Cybersecurity Engineering Design Project (6 credits)**

Course Instructor:

TBDs

[TBDs]@concordia.ca

Office Hours:

TBD

Tutorials: N/A.

Labs: Please see your class schedule for details

Course Calendar Description:

Students work in groups to design, implement and/or validate solutions to a complex interdisciplinary cybersecurity problem, typically involving vulnerabilities, threats, and/or defenses of a security-critical system in a sandbox environment or simulated-use case. Each team will demonstrate the project and prepare adequate demonstration and documentation. The project also fosters teamwork between group members and allows students to develop project management, technical writing, and technical presentation skills.

Component(s): Tutorial: 1 hour/week, two terms. Laboratory-equivalent time: 3 hours/week, two terms.

Notes: Students will work in groups under the direct supervision of a faculty member.

Prerequisites: ENGR 301, ENGR 391; INSE 390

Students must complete 75 credits in the program prior to enrolling.

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Programming
- Computer architecture and operating systems
- Communication networks and protocols
- Baseline security controls (access control, cryptography, firewalls, etc.)
- Vulnerability assessment and threat modeling
- Security operations and incident handling
- Technical writing and reporting

Course materials

- **Required textbook:** N/A
- **Suggested textbook:** To be determined based on the specific projects available each term.
- **Instructor’s lecture notes:** Will be posted on the Moodle course site.
- **Lab manual:** To be determined based on the specific projects available each term.
- **Software use:** To be determined based on the specific projects available each term.

Grading Scheme

Assessment Tool	Weight
Project selection and planning <ul style="list-style-type: none"> • Group formation • Faculty supervisors • Industry partners and the support letter (if any) 	10%
Detailed project proposal <ul style="list-style-type: none"> • Objective • Potential application areas • Potential customers • Current or potential competitors • Product main features/functionalities, desired dimensions • Partners (potential vendors, research centers) 	10%
Detailed project design <ul style="list-style-type: none"> • Alternative solutions • Evaluation of alternatives • Candidate solution that best serves the objectives 	20%
Preliminary solutions <ul style="list-style-type: none"> • Prototype demonstration and/or simulations Evaluation of design with respect to its impact on: <ul style="list-style-type: none"> • Society and environment • Professional practice and legal issues Evaluation of design with respect to: <ul style="list-style-type: none"> • Ethics and equity 	20%
Final project report and presentations <ul style="list-style-type: none"> • A working prototype of the best alternative • Detailed documentation of the final prototype/product and its performance • Evaluation of the project based on its compliance with design objectives • Dissemination cost (for software) and/or manufacturing cost (for hardware) • Entrepreneurship opportunities • Potential customers and investors • Potential funding sources • IP and patent issues • Competition • Life-cycle analysis 	40%

Tentative Course Schedule

The following are based on a 12-week semester schedule, each with 2 weeks of final exams.

Weeks 1-14 are in the Fall term, and Weeks 15-28 are in the Winter term. The final product presentation may be scheduled before the finals period to be consistent with the rest of the capstone projects.

Milestones	Weeks
Phase 1: Project Proposal	1-5
Group Formation and Project Selection	1
Project Proposal Development	2-4
Proposal Report	4
Proposal Presentation	5
Phase 2: Project Design	6-14
Project Design Development	6-11
Design Report	11
Design Presentation	12
Final Design Approval	14
Phase 3: Prototype Development	15-18
First Prototype Development	15-18
First Prototype Demonstration	18
Phase 4: Final Product	18-28
Final Prototype Development	18-25
Final Prototype Demonstration	25
Final Product Presentation (Oral/Poster)	27
Final Product Report	28

Lab Details: To be determined based on the specific projects available in a given term.

Engineering Tools: To be determined based on the specific projects available in a given term.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the two terms.

Graduate Attribute	Indicators	Level of Coverage
A knowledge base for engineering	<ul style="list-style-type: none"> • Knowledge base in specific domain 	Advanced
Problem Analysis	<ul style="list-style-type: none"> • Problem identification and formulation • Modeling • Problem solving • Analysis 	Advanced
Investigation	<ul style="list-style-type: none"> • Background and hypothesis formulation • Designing experiments • Conduction experiments and collection of data • Analysis and interpretation of data 	Advanced
Design	<ul style="list-style-type: none"> • Define objective 	Advanced

	<ul style="list-style-type: none"> • Idea generation and selection • Detailed design • Validation and implementation 	
Use of engineering tools	<ul style="list-style-type: none"> • Ability to use appropriate engineering tools and resources • Ability to select appropriate tools, techniques, and resources 	Advanced
Individual and teamwork	<ul style="list-style-type: none"> • Cooperation and work ethics • Contribution: practical/conceptual • Initiative and leadership • Delivering results 	Advanced
Communication Skills	<ul style="list-style-type: none"> • Writing process • Information gathering • Documentation • Oral presentation 	Advanced
Professionalism	<ul style="list-style-type: none"> • Role and responsibilities of professional engineers • Professional practice 	Advanced
Impact of engineering on society & the environment	<ul style="list-style-type: none"> • Awareness of society and environment impact • Sustainability in design 	Advanced
Ethics and equity	<ul style="list-style-type: none"> • Professional ethics and accountability • Equity 	Advanced
Economics and project management	<ul style="list-style-type: none"> • Fundamentals of economics • Economics evaluation of projects • Project planning and implementation 	Advanced
Life-long learning	<ul style="list-style-type: none"> • Identifying missing knowledge and learning opportunities • Continuous improvement and self-learning 	Advanced

Course Learning Outcomes (CLOs):

By the end of this semester, successful students can expect to acquire the following skills:

Course Learning Outcome	Related Graduate Attributes
Collect, develop, and specify requirements for a security control or application based on analyses of potential vulnerabilities and exploits.	<ul style="list-style-type: none"> • Knowledge base in a specific domain • Background and hypothesis formulation • Problem identification and formulation • Modeling • Problem solving • Analysis
Design an effective solution/procedure to prevent, detect, and/or mitigate a cyber threat, with an appropriate mix of software and possibly hardware components using	<ul style="list-style-type: none"> • Define objective • Idea generation and selection • Detailed design • Validation and implementation Designing experiments

modern cybersecurity techniques, skills, software, libraries, APIs and/or tools.	<ul style="list-style-type: none"> • Conduction experiments and collection of data • Analysis and interpretation of data • Ability to use appropriate engineering tools and resources • Ability to select appropriate tools, techniques, and resources
Identify and apply appropriate incident handling and security hardening to reduce cyber security risks and respond to security incidents and events.	<ul style="list-style-type: none"> • Ability to use appropriate engineering tools and resources • Ability to select appropriate tools, techniques, and resources • Fundamentals of economics • Economics evaluation of projects • Project planning and implementation
Work effectively as part of a team. Make significant contributions to the team's work.	<ul style="list-style-type: none"> • Cooperation and work ethics • Initiative and leadership • Project planning and implementation
Communicate in speaking and writing to develop cyber threat intelligence and collaborate with a broader community of stakeholders to improve baseline security across an ecosystem.	<ul style="list-style-type: none"> • Contribution: practical/conceptual • Writing process • Information gathering • Documentation • Oral presentation • Delivering results • Awareness of society and environment impact • Sustainability in design • Identifying missing knowledge and learning opportunities
Recognize professional responsibilities and make informed judgments in cybersecurity practice based on legal and ethical practices.	<ul style="list-style-type: none"> • Role and responsibilities of professional engineers • Professional practice • Professional ethics and accountability • Equity • Continuous improvement and self-learning

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University](#)

On Campus Resources

Please visit [Student Services at Concordia University](#) for the services available to Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 498 Topics in Cybersecurity Engineering (3 credits)**

Course Instructor:

TBD
[TBD]@concordia.ca

Office Hours:

TBD

Tutorials: N/A

Labs: N/A

Course Calendar Description:

These courses may be offered in a given year upon the authorization of CIISE. When offered, they will cover concepts, theories, and practical knowledge on topics in cybersecurity engineering that will complement elective courses in cybersecurity engineering in a given year.

Component(s): Lecture 3 hours per week

Prerequisites: Permission of the Department is required.

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the topic offered in a given year. The specific knowledge and skills needed will be determined and announced based on the offered topic.

Course materials

- **Required textbook:** A textbook is usually not required, though it is to be determined by the course instructor based on the specific topic offered in a given term.
- **Suggested textbook:** To be determined based on the specific topic being offered in a given term.
- **Instructor's lecture notes:** Will be posted on Moodle course management site.
- **Lab manual:** To be determined based on the specific topic offered in a given term.
- **Software use:** To be determined based on the specific topic offered in a given term.

Grading Scheme

The following is a reference grading scheme for the course, which may be finalized by the course instructor according to the specific topic being offered in a given year.

Assessment Tool	Weight
Assignments	25%
Course project	40%
Final exam	30%
Class participation	5%

Passing Criteria:

To be determined based on the specific topic being offered in a given term.

Tentative Course Schedule

To be determined based on the specific topic offered in a given term.

Lab Details

To be determined based on the specific topic offered in a given term.

Engineering Tools

To be determined based on the specific topic offered in a given term.

Details on assessment tools

To be determined based on the specific topic offered in a given term.

Other information

To be determined based on the specific topic offered in a given term.

Graduate Attributes

The graduate attributes, indicators, and the reporting of assessment results will be specified by the course instructor. The levels of coverage shall be intermediate or advanced, which will be determined by the course instructor offering the specific topic.

Course Learning Outcomes (CLOs):

By the end of this semester, successful students can expect to acquire cybersecurity skills that will complement those in other electives offered in a given year. The CLOs and corresponding GAs will be specified by faculty members offering the chosen topic in a given term.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University](#)

On Campus Resources

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Appendix 3a: Graduate attribute mapping (B.Eng. In Cybersecurity Engineering)

Graduate attribute mapping for A Knowledge Base for Engineering.

Demonstrated competence in university-level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.

		Rubrics		Level			
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method
Knowledge base of mathematics	<ul style="list-style-type: none"> Mathematically model complex engineering problems Identify appropriate techniques to solve mathematical problems Show detailed understanding of mathematical concepts and how they are applied in engineering 	A	Identifies and applies appropriate techniques for solving the problem in specific context	COMP 232 ENGR 213 ENGR 233	ENGR 245 INSE 221	ENGR 371 ENGR 391 INSE 321 INSE 411 INSE 481	Project work Assignments Written examinations Case studies
		B	Identifies approaches for solving the problem, and some of which apply within a specific context.				
		C	Identifies and approach that is only partly applicable for the context				
		F	Does not identify or apply the correct approaches to mathematical problems				
Knowledge base of natural science	<ul style="list-style-type: none"> Identify the appropriate techniques for solving natural science problems Use knowledge in natural science to solve engineering problems Recall previous learning in natural science 	A	Identifies and applies appropriate techniques for solving the problem in specific context	ENGR 245 INSE 351 MIAE 221	ELEC 275 ENGR 233		Project work Assignments Written examinations Case studies
		B	Identifies approaches for solving the problem, and some of which apply within a specific context.				
		C	Identifies and approach that is only partly applicable for the context				
		F	Does not identify or apply the correct approaches to natural science problems				
Knowledge base in a specific domain	<ul style="list-style-type: none"> Recall solution techniques from engineering, science, and mathematics Identify the appropriate approach to solve domain-specific problems Combine methods to solve complex problems Exhibit deep domain-specific knowledge 	A	Capable of expressing real problems in an engineering context using knowledge from the domain and prior learning	COMP 248 ENGR 245 INSE 351 MIAE 221 SOEN 228	COMP 228 COMP 249 COMP 346 COMP 352 INSE 221 INSE 341 INSE 390 INSE 412 INSE 485	COMP 352 COMP 348 COMP 445 ENGR 371 ENGR 391 INSE 321 INSE 411 INSE 441 INSE 442 INSE 452 INSE 481 INSE 483 INSE 490	Project work Assignments Written examinations Case studies
		B	Capable of expressing the most important aspects of real problems in the domain, while simplifying or neglecting some aspects				
		C	Some difficulty to express and/or solve engineering problems and to leverage prior knowledge				
		F	Capable of expressing or solving only the simplest problems in the domain				

Graduate attribute mapping for Problem Analysis.

An ability to use appropriate knowledge and skills to identify, analyze, and solve complex engineering problems in order to reach substantiated conclusions.							
Indicators	Students can..	Rubrics		Level			Suggested assessment method
		Grade	Definition	Introduce	Develop	Apply	
Problem identification and formulation	<ul style="list-style-type: none"> • Demonstrate a good understanding of the problem. • Demonstrate confidence in answering questions: What information is given? What more information do you need? • Demonstrates the capability of identifying unknowns and ambiguities (assumptions). • Describe in general terms what a solution would look like. 	A	Demonstrates understanding of how various pieces of the problem relate to each other and the whole. Identifies multiple approaches for solving the problem that apply within a specific context.	COMP 232 ELEC 275 ENGR 213 ENGR 233 ENGR 245 INSE 351	COMP 346 COMP 348 INSE 221 INSE 390 INSE 452 INSE 481 INSE 482 INSE 483 INSE 486	COMP 352 INSE 321 INSE 411 INSE 412 INSE 441 INSE442 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Demonstrates some understanding of how various pieces of the problem relate to each other and the whole. Identifies multiple approaches for solving the problem, only some of which apply within a specific context.				
		C	Demonstrates minimal understanding of how various pieces of the problem relate to each other and the whole. Identifies only a single approach for solving the problem that does apply within a specific context.				
		F	Demonstrates no understanding of how various pieces of the problem relate to each other and the whole. Identifies one or more approaches for solving the problem that do not apply within a specific context.				
Modelling	<ul style="list-style-type: none"> • Extract parameters and variables from problem statement (look for essence of the problem). • Demonstrate the capability of making valid assumptions. • Use logic (deduction) to formulate model from assumptions. • Demonstrate ability to identify limitations, possible extensions. • Compare modelling strategies: Logical-mathematical models versus physical models. 	A	Demonstrates the ability to construct a clear and insightful problem statement with evidence of all relevant contextual factors.	ELEC 275 ENGR 213 ENGR 245 INSE 351	COMP 346 COMP 445 ENGR 233 INSE 390 INSE 481 INSE 482	COMP 352 INSE 411 INSE 412 INSE 441 INSE442 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Demonstrates the ability to construct a problem statement with evidence of most relevant contextual factors, and problem statement is adequately detailed.				
		C	Begins to demonstrate the ability to construct a problem statement with evidence of most relevant contextual factors, but problem statement is superficial.				
		F	Demonstrates a limited ability in identifying a problem statement or related contextual factors.				
Problem solving	<ul style="list-style-type: none"> • Make educated guesses and verify. • Consider a special case. • Generalize the problem. • Use mathematical tools. • Use computer programs and computer simulation. 	A	Not only develops a logical, consistent plan to solve problem, but recognizes consequences of solution and can articulate reason for choosing solution.	COMP 232 ELEC 275 ENGR 213 ENGR 245 INSE 351	ENGR 233 INSE 341 INSE 390 INSE 452 INSE 481 INSE 482	COMP 352 INSE 411 INSE 441 INSE442 INSE 490	Project work Assignments Written examinations Case studies
		B	Having selected from among alternative, develops a logical, consistent plan to solve the problem.				
		C	Considers and rejects less acceptable approaches to solving problem.				
		F	Only a single approach is considered and is used to solve the problem.				
Analysis (uncertainty and incomplete knowledge)	<ul style="list-style-type: none"> • Simplify model (remove unnecessary details). • Identify similar problems. • Split problem into sub-parts. • Identify elements of uncertainty. • Derive new facts. • Identify patterns. 	A	Organizes and synthesizes evidence to reveal insightful patterns, differences, or similarities related to focus.	ELEC 275 INSE 341 INSE 351 SOEN 228	COMP 352 INSE 390 INSE 452 INSE 481 INSE 482 INSE 483 INSE 486	COMP 352 INSE 411 INSE 412 INSE 441 INSE 442 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Organizes evidence to reveal important patterns, differences, or similarities related to focus.				
		C	Organizes evidence, but the organization is not effective in revealing important patterns, differences, or similarities.				
		F	Lists evidence, but it is not organized and/or is unrelated to focus.				

Graduate attribute mapping for **Investigation.**

An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data, and synthesis of information in order to reach valid conclusions.							
Indicators	Students can..	Rubrics		Level			Suggested assessment method
		Grade	Definition	Introduce	Develop	Apply	
Background and hypothesis formulation	<ul style="list-style-type: none"> Describe the setting for the investigation (Why are we doing it? What are we expecting?) Consider whether it has been done before and how it relates to theory/other information (hypothesis may not be necessary, could be just measurement) 	A	Capable of defining all the fundamentals and formulating the hypothesis related to given engineering problem.	ENGR 371 INSE 411	INSE 390 INSE 482	INSE 412 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Capable of defining 80% of the fundamentals and formulating the hypothesis related to given engineering problem with minor flaws.				
		C	Capable of defining 50% of the fundamentals and formulating the hypothesis related to given engineering problem with sufficient flaws.				
		F	Not able to comprehend the engineering problem and establish a reasonable test hypothesis.				
Designing experiments	<ul style="list-style-type: none"> Identify random sample Avoid bias Design a controlled experiment (not all experiments are controllable – how do you deal with this?) Choose instruments and testing method Consider limitations of equipment Demonstrate understanding of concepts of reproducibility, accuracy, feasibility, cost, size Discuss issue of materials versus measurements Discuss difficulty of duplication Demonstrate knowledge of the tools (related to Use of Engineering Tools attribute) 	A	Objective is clear, controllable factors are well defined. Experimental set-up is accurate. Data collection scheme and data analysis methodologies are appropriate. All the safety measures are considered.	ENGR 371 INSE 411 INSE 481	INSE 390 INSE 482	INSE 412 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Objective is clear, controllable factors are defined but has minor flaws. Experimental set-up is accurate. Data collection scheme and data analysis methodologies are addressed well but include some inconsistencies. Safety measures are considered.				
		C	Objective is defined but not clear, selection of controllable factors are not well justified. Experimental set-up has flaws. The methodology proposed for data collection and analysis is not accurate.				
		F	Objective is not clear. Controllable factors are not defined or has major flaws. Proposed methodologies for data collection and analysis are wrong.				
Conducting experiments and collection of data	<ul style="list-style-type: none"> Consider variability/operator error Discuss random sampling Report all data objectively Discuss safety issues Discuss ethical issues including obtaining appropriate permissions if experiments involve humans 	A	Excellent understanding of a random sampling and applies this when analyzing the experiment. Suggests good measures to either change experiment or address the issues on the collected data.	ENGR 371 INSE 411 INSE 481	INSE 390 INSE 452 INSE 482	INSE 412 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Excellent understanding of a random sampling and applies this when analyzing the experiment. Suggests good measures to either change experiment or address the issues on the collected data.				
		C	Some significant flaws but displays an adequate understanding of the issues.				
		F	Some basic misunderstanding of the issues				
Analysis and interpretation of data	<ul style="list-style-type: none"> Use methods from probability and statistics to analyze and interpret data Match experimental results with theory Validate assumptions Discuss what went wrong/error analysis Synthesize information to arrive at substantiated conclusions 	A	Demonstrates a very strong ability to interpret problem statements, stating semi-formal expectations through use of cases, domain models and operation contracts and providing solutions (how to) through high- and low-level designs as well as planning for implementation. Demonstration of responsibility. Ability to trace requirements to implementation (and vice versa).	ENGR 371 INSE 411 INSE 481	INSE 390 INSE 452 INSE 482	INSE 412 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Demonstrates good ability to interpret problem statements, stating intentions (use cases and domain model) and translating them to design/implementation through class interaction.				
		C	Demonstrates an average ability to interpret specifications and translate them to interaction diagrams and/or to code, but no full support on analysis and design.				
		F	Demonstrates little ability to interpret specifications and translate them to interaction diagrams and/or to code, and no full support on analysis and design.				

Graduate attribute mapping for Design.

The ability to perform engineering design. Engineering design is a process of making informed decisions to creatively devise products, systems, components, or processes to meet specified goals based on engineering analysis and judgement. The process is often characterized as complex, open-ended, iterative, and multidisciplinary. Solutions incorporate natural sciences, mathematics, and engineering science, using systematic and current best practices to satisfy defined objectives within identified requirements, criteria and constraints. Constraints to be considered may include (but are not limited to): health and safety, sustainability, environmental, ethical, security, economic, aesthetics and human factors, feasibility and compliance with regulatory aspects, along with universal design issues such as societal, cultural and diversification facets.

		Rubrics		Level			
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method
Define the Objective	<ul style="list-style-type: none"> Consult client and ask questions Gather information and describe the problem Gather information on prior solutions Find out about social and environmental needs Define the objective of the corporate (owner of the design) 	A	Identify key issues in the design that will impact the client. Can describe the needs of the client beyond what they say they want. Readily gathers relevant information and develop elegant models to apply to their design.	INSE 351 INSE 411 INSE 481 SOEN 228	COMP 346 COMP 445 INSE 483 INSE 486	INSE 390 INSE 490	Project work Assignments Written examinations Case studies
			Can identify the needs of the client in the design. Shows how these needs have guided the design.				
		B	Can articulate the needs of the client related to the need being addressed by the current project. May include extraneous information, but ultimately find correct ones and develop model(s) to apply to their designs.				
		C	Can identify what the client says they want in the design. Can identify few needs of the customer relative to the design. Has difficulty deciding what information to use, but may develop a close to correct model to apply to their design.				
		F	Cannot identify how the needs of the client relate to the design of the current project. Cannot identify relevant information or develop models to apply to their design.				
Idea generation and selection	<ul style="list-style-type: none"> Critique alternative solutions Create new, unique, untried solutions Demonstrate thinking outside the box Generate many possible diverse solutions, followed by a rational process of selection Use techniques to help evaluate different solutions with a good argument (e.g., brainstorm, lateral thinking, and for selection (e.g., decision grids, force-field analysis) 	A	Extends a novel or unique idea, question, format, or product to create new knowledge or knowledge that crosses boundaries. Thoroughly analyzes different solutions and carefully evaluates the relevance of contexts when presenting an argument.	COMP 352 ENGR 245 INSE 351 INSE 411	COMP 346 INSE 483	INSE 390 INSE 490	Project work Assignments Written examinations Case studies
			Creates a novel or unique idea, question, format, or product. Identifies own and others' assumptions and several relevant contexts when presenting a position. Identifies different solutions and evaluates the relevance of contexts when presenting an argument.				
		C	Experiments with creating a novel or unique idea, question, format, or product. Identifies limited solutions and evaluates the relevance of contexts when presenting an argument.				
		F	Reformulates a collection of available ideas. Shows awareness of different solutions. Begins to identify some contexts when presenting an argument.				
Detailed Design	Describe a complex solution that allows implementation	A	Reviews a number of reasonable alternatives before finalizing design decisions. Initiates appropriate design iterations. Excellent cost estimates. Design principles applied appropriately and without error.	COMP 249 INSE 351 INSE 411	COMP 346 COMP 352 COMP 346 COMP 445 INSE 483	INSE 390 INSE 490	Project work Assignments Written examinations Case studies
			Identifies some alternative approaches before finalizing design decisions. Occasionally initiates design iterations, or done with prompting. Provides reasonable cost estimates.				
		B	Applies design principles appropriately to achieve reasonable solution.				
		C	Few if any alternative approaches explored for design decisions. Serious deficiencies in iterating through the design process. Reasonable cost estimates. Uses design principles but with serious errors.				
		F	Does not consider alternatives when making design decisions. No appropriate iterations in the design process considered. No review of prior work. Sound design principles are not used or used incorrectly. No cost estimates.				
Validation and Implementation	Validate design against specs (does it meet all requirements, e.g., cost, efficiency, codes, etc.?)	A	Design meets or exceeds requirements and constraints. Insightful evaluation supports conclusions and recommendations.	COMP 248 SOEN 228 INSE 351 INSE 411	COMP 249 COMP 346 COMP 352 COMP 445 INSE 483	INSE 390 INSE 490	Project work Assignments Written examinations Case studies
			Design meets requirements and constraints with moderately effective use of resources.				
		B	Sound evaluation of design supports conclusions.				
		C	Design barely meets requirements and constraints. Evaluation of design incomplete or partially erroneous.				

	F	Design does not meet requirements and constraints. No evaluation of design done or done incorrectly.	INSE 48b	
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Graduate attribute mapping for Use of Engineering Tools

An ability to create, select, apply, adapt, and extend appropriate techniques, resources, and modern engineering tools to a range of engineering activities, from simple to complex, with an understanding of the associated limitations.							
Indicators	Students can..	Rubrics		Level			Suggested assessment method
		Grade	Definition	Introduce	Develop	Apply	
Ability to select appropriate tools, techniques, and resources	<ul style="list-style-type: none"> Evaluate suitability of the tools for the task. In labs, choose the right tools/techniques for problem. In projects, demonstrate ability to select appropriate tools and techniques. 	A	Defends assumptions and approximations made.	INSE 351 INSE 411	ENGR 391 INSE 221 INSE 390 INSE 452 INSE 481	INSE 321 INSE 490	Project work Assignments Written examinations Case studies
		B	Selects and applies appropriate quantitative model to solve problems, using reasonable approximations and assumptions.				
		C	Selects model but some errors and inappropriate assumptions.				
		F	Does not select model, or selected model is inappropriate.				
Ability to use appropriate engineering tools, techniques and resources	<ul style="list-style-type: none"> Demonstrate individual use of tools (to be assessed in labs and assignments). 	A	Successfully performs experiments involving engineering principles, including bench scale unit operations, and correctly documents all required results.	COMP 248 ELEC 275 INSE 341 INSE 411 SOEN 228	COMP 228 COMP 249 COMP 346 COMP 352 COMP 445 ENGR 391	COMP 348 INSE 321 INSE 490	Project work Assignments Written examinations Case studies
		B	Successfully performs experiments involving engineering principles, including bench scale unit operations, and correctly documents some of the results.				
		C	Makes a few errors in the experiments leading to errors.				
		F	Unable to perform the experiments.				
Demonstrate awareness of limitations of tools, create and extend tools as necessary	<ul style="list-style-type: none"> Demonstrate awareness of limitations of tools used. Address limitations of given tools by extending tools and combining tools. Address limitations of given tools by creating new tools. Address limitations of given tools by choosing different tools. 	A	Shows excellent understanding of the system operating procedures, accuracy of the sensors and limitations of the experiment in the analysis and discussion of the experimental results.	ELEC 275	ENGR 391 INSE 221 INSE 482 INSE 483	INSE 321	Project work Assignments Written examinations Case studies
		B	Shows good understanding of how the system works. Considers and takes into account the experimental errors.				
		C	Can reasonably operate the system. Shows satisfactory understanding of major experimental errors.				
		F	Lacks understanding of the system operation. Does not analyze experimental results in light of accuracy of data or experimental limitations.				

Graduate attribute mapping for Communication Skills.

An ability to communicate complex engineering concepts within the profession and with society at large. Such abilities include reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.

		Rubrics		Level			
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method
Writing Process	<ul style="list-style-type: none"> Identify audience needs, interests and level of knowledge Frame supportable, significant theses and arguments Develop appropriate expository and argumentative strategies Identify and utilize relevant, high-quality resources Create drafts and revisions Respond to critical feedback Articulate research questions 	A	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer.	ENCS 282 ENGR 301 INSE 481	ENGR 392 INSE 452 INSE 486	INSE 412 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.				
		C	Uses appropriate and relevant content to develop and explore ideas through most of the work.				
		F	Uses appropriate and relevant content to develop simple ideas in some parts of the work.				
Information Gathering	<ul style="list-style-type: none"> Articulate research questions Formulate research plans and data collection strategies Develop effective use of databases, library resources Evaluate quality and usefulness of sources Maintain complete and accurate records of sources used 	A	Synthesizes in-depth information from relevant sources representing various points of view/approaches.	ENCS 282 ENGR 301 INSE 481	ENGR 392	INSE 490	Project work Assignments Written examinations Case studies
		B	Presents in-depth information from relevant sources representing various points of view/approaches.				
		C	Presents information from relevant sources representing limited points of view/approaches.				
		F	Presents information from irrelevant sources representing limited points of view/approaches.				
Documentation	<ul style="list-style-type: none"> Choose correct genre and format Organize information appropriately for readers' use Identify and utilize correct citation format Differentiate between correct source usage and plagiarism 	A	Has exemplary ability to use information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution and demonstrate a full understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.	COMP 248 INSE 481	ENCS 282 ENGR 392 INSE 390 INSE 483	INSE 490	Project work Assignments Written examinations Case studies
		B	Has proficient ability to use information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution and demonstrate some understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.				
		C	Has developing ability to use information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution and demonstrate minimal understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.				
Oral Presentation	<ul style="list-style-type: none"> Demonstrate understanding of cognitive and conceptual differences between oral and written presentation Create appropriate scope for treatment of topic in oral presentation Adapt written text to oral presentation Identify audience needs, interests and level of knowledge Plan, design and effectively utilize visual materials Utilize effective presentation techniques Identify strategies to overcome linguistic difference Adapt presentation to heterogeneous audiences 	A	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Delivery techniques make the presentation compelling, and speaker appears polished and confident. A variety of types of supporting materials make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.	ENCS 282 INSE 481	ENGR 392 INSE 390	INSE 412 INSE 485 INSE 486 INSE 490	Project work Assignments Written examinations Case studies
		B	Language choices are thoughtful and generally support the effectiveness of the presentation. Delivery techniques make the presentation interesting, and speaker appears comfortable. Supporting materials make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.				
		C	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Delivery techniques make the presentation understandable, and speaker appears tentative. Supporting materials make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.				
		F	Language choices are unclear and minimally support the effectiveness of the presentation. Delivery techniques detract from the understandability of the presentation, and speaker appears uncomfortable. Insufficient supporting materials make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.				

Graduate attribute mapping for Individual and Team Work.

An ability to work effectively as a member and leader in teams, preferably in a multi-disciplinary setting.

		Rubrics		Level				
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method	
Cooperation and Work Ethics	<ul style="list-style-type: none"> Actively participate in meetings Communicate within the group Co-operate within the group Assist teammates when needed Volunteer for tasks Respect teammates 	A	Actively participates in team meetings; assists the team members when needed; respects the team members and their ideas; displays a positive attitude within the team; respects the deadlines; respects the commitments and is co-operative with other team members.	ELEC 275 ENGR 213 ENGR 301	INSE 221 INSE 390 412 486	INSE INSE	INSE 321 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Participates in team meetings; assists the team members; respects the team members; respects the deadlines; co-operative with other team members.					
		C	Tries to participate in the team meetings; assists the team members a few times; respects the deadlines; is generally respectful to other team members and their ideas.					
		F	Does not attend the team meetings regularly; does not communicate with other team members; disrespectful to other team members; does not meet the deadlines.					
Contribution: practical/conceptual	<ul style="list-style-type: none"> Research and gather information Ensure the quality of individual contribution Suggest ideas Write reports or section of reports Provide constructive feedback on the report(s) or presentations Contribute to the presentation 	A	Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive, and advances the project. Proactively helps other team members complete their assigned tasks to a similar level of excellence. Helps the team move forward by articulating the merits of alternative ideas or proposals.	ELEC 275 ENGR 301 SOEN 228	INSE 221 INSE 390 INSE 412	INSE 321 INSE 485 INSE 490	Project work Assignments Written examinations Case studies	
		B	Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive, and advances the project. Offers alternative solutions or courses of action that build on the ideas of others.					
		C	Completes all assigned tasks by deadline; work accomplished advances the project. Offers new suggestions to advance the work of the group.					
		F	The ideas and work provided do not advance the work of the group.					
Initiative and Leadership	<ul style="list-style-type: none"> Conceptual contribution as measured by peer evaluation Demonstrates leadership and initiative Supports shared leadership? 	A	Takes initiative to do most of the activities of the project; voluntarily takes the leadership of the team; organizes the meetings; respects other team members and their ideas; volunteers to do the project presentation; manages any kind of conflicts within the group.	ELEC 275	INSE 390 INSE 412 INSE 486	INSE 485 INSE 490	Project work Assignments Written examinations Case studies	
		B	Takes initiative to do different activities of the project; voluntarily takes the leadership of the project team; organizes the meetings; respects other team members and their ideas; tries to manage any kind of conflicts within the group.					
		C	Takes initiative to do some of the activities of the project; upon discussion with the group, takes the leadership of the project team; organizes most of the meetings; usually respects other team members and their ideas; tries to manage any kind of conflicts within the group.					
		F	Does not take initiative to do the activities of the project; does not have the leadership skill; is sometimes not respectful to other team members and their ideas; does not volunteer to do the project presentation; cannot manage conflicts within the group.					
Delivering Results	<ul style="list-style-type: none"> Has the group delivered the expected results in a timely manner? Will the group members work together on a new project in the future? 	A	Delivers an extemporaneous presentation, with clearly defined objectives, an easy-to-follow structure, and a simple straightforward presentation style. Responds to questions with confidence and ease. The presentation respects the time specifications.	ELEC 275 SOEN 228	INSE 390 INSE 486	INSE 485 INSE 490	Project work Assignments Written examinations Case studies	
		B	Delivers a presentation that may or may not rely on notes, or may be memorized. The objectives of the presentation may be buried in unnecessary information, but are available to the audience. Presentation style is easy, but may be awkward at times, or seem unpracticed. Responds adequately to questions. The presentation may run under or over the time limits.					

Will the group members work together on a new project in the future?

C	Delivers a presentation that relies heavily on notes, or is stiffly memorized. The objectives of the presentation are unclear, and the audience is not able to follow the presentation structure. Presentation style is awkward. Attempts but may not respond directly to questions. Presentation is over or under time restrictions.
F	Delivers a presentation that is read. The objectives of the presentation are unclear, impossible to follow, or not present. Presentation style is uncomfortable. Fails to respond to audience questions. Presentation does not follow the time restrictions.

Studies

Graduate attribute mapping for **Professionalism.**

An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest.

		Rubrics		Level			
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method
Role and responsibilities of the professional engineer	<ul style="list-style-type: none"> • Appreciate the role filled by professional engineers and the imperative of the security of the public. • Describe the role of engineers in Quebec’s professional system. • Differentiate between professional and personal roles. • Understand the professional values of the engineering profession: competence, responsibility, ethical conduct, and social engagement. • Distinguish between dimensions of responsibility – moral, legal and social. • Describe liability in Quebec’s legal system. • Identify legal issues and responsibility pertaining to life, occupational health and safety, and intellectual property. • Apply responsibility in professional context. 	A	Cites correct, relevant professional standards. Application of standards to project is well- detailed and thorough. If none are applicable, provides clear explanation, and indicates what kind of standards might be useful for project. Clearly indicates superior understanding of professional standards. Excellent understanding of the different dimensions of professional responsibility.	ENCS 282 ENGR 201 INSE 351 INSE 411	ENGR 202 INSE 452	INSE 490	Project work Assignments Written examinations Case studies
		B	Cites correct, relevant professional standards, and applies them to project. If none are applicable, clear reasoning is provided. Clearly indicates good understanding of professional standards and responsibility.				
		C	Cites relevant professional standards. Identifies the standards that apply to projects or states clearly if none are applicable. Indicates satisfactory understanding of professional responsibility.				
		F	Cites poor or provides no reference to professional standards or code; no clear evidence of appreciation or understanding of professional standards. Unsatisfactory understanding of professional responsibility.				
Professional practice	<ul style="list-style-type: none"> • Communicate through accepted professional means. • Identify relevant professional standards. • Adopt a professional conduct. • Consider their engineering practice in the perspective of sustainability. 	A	On time delivery; Respects peers and others; full understanding of the problem; Excellent communication (written and oral) with the client (stakeholders); Always provides accurate information; fully competent in the field.	ENCS 282 ENGR 201		INSE 490	Project work Assignments Written examinations Case studies
		B	Mostly on time; Respects peers and others; good understanding of the problem/field; very good communication (written and oral) with the client (stakeholders); Provides accurate information; competent in the field.				
		C	Acceptable time management; get along well with stakeholders; communication manner is acceptable; Provides accurate information; competent in the field.				
		F	Lacking some or all aspects mentioned above.				

Graduate attribute mapping for **Impact of Engineering on Society & the Environment**

An ability to analyze social and environmental aspects of engineering activities. Such abilities include an understanding of the interactions that engineering has with the economic, social, health, safety, legal and cultural aspects of society.

Indicators	Students can..	Rubrics		Level			Suggested assessment method
		Grade	Definition	Introduce	Develop	Apply	
Awareness of society and environment	<ul style="list-style-type: none"> Recognize relevance of societal impact of engineering to improving innovation Categorize wide range of engineering and society relationships, including economic, social, health, safety, legal and cultural aspects Demonstrate familiarity with evolution of technologies 	A	Complete understanding of environmental aspects. Effective in addressing of environmental issues leading to a better result.	ENGR 202 ENGR 301 INSE 351 INSE 481	ENGR 392 INSE 411	INSE 490	Project work Assignments Written examinations Case studies
		B	Sound understanding of environmental aspects. Mostly effective in addressing environmental issues.				
		C	Environmental aspects are addressed ineffectively with little or no effect on end results.				
		F	No understanding or appreciation of the importance of environmental concerns.				
Sustainability in design	<ul style="list-style-type: none"> Identify social and environmental protection issues Locate challenges to sustainability from technological design Identify knowledge gaps and the need for additional data when designing for optimal social and environmental impact Design strategies for incorporating social sustainability Utilize appropriate models in engineering design for optimal social and environmental impact 	A	Able to demonstrate knowledge of more than one contemporary societal or community issue. Excellent discussion of engineering implications of multiple contemporary issues with reasoned examples and sound rationale. Excellent discussions of one or more larger community need that is being addressed by the project partner.	ENGR 202 INSE 351 INSE 481	ENGR 392 INSE 411	INSE 490	Project work Assignments Written examinations Case studies
		B	Able to demonstrate knowledge of one or more contemporary societal or community issues. Able to describe engineering implications of one or more contemporary issues with some examples and rationale. Able to describe at least one larger community need that is being addressed by the project partner.				
		C	With assistance, can demonstrate some knowledge of one contemporary community or societal issue. Explanation of implications of engineering to a societal issue is mostly ineffective and lacking. Needs assistance to identify one larger community need being addressed by the project partner.				
		F	Unable to demonstrate knowledge of one or more contemporary societal or community issues. Unable to describe engineering implications of one or more contemporary issues. Unable to describe at least one larger community need that is being addressed by the project partner.				

Graduate attribute mapping for Ethics and Equity

An ability to apply professional ethics, accountability and equity.

		Rubrics		Level				
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method	
Professional ethics and accountability	<ul style="list-style-type: none"> • Distinguish professional ethics from ethics in Canada and Quebec • Define and categorize concepts such as trust and loyalty • Identify duties and obligations in the professional or engineer's code • Apply professional ethics in case studies • Describe accountability to multiple constituencies: engineering profession, public, client • Apply accountability to professional context 	A	Can discuss aspects of professional ethics related to a given situation. Can make a sensible deduction with respect to the situation presented.	ENCS 282 ENGR 201 ENGR 301 INSE 411	ENGR 202 ENGR 392 INSE 390 INSE 452	INSE 221 321 490	INSE INSE	Project work Assignments Written examinations Case studies
		B	Can discuss aspects of professional ethics related to a given situation but cannot make a clear deduction with respect to the situation.					
		C	Familiar with aspects of professional ethics but cannot make a sensible deduction in the context of the given situation.					
		F	Unfamiliar with basic terminology and issues associated with professional ethics.					
Equity	<ul style="list-style-type: none"> • Describe professional obligations against discrimination • Appreciate gender dimensions of equity • Identify economic disparity as a challenge in globalization and sustainability 	A	Shows comprehensive theoretical and conceptual understanding of social responsibility. Develops insightful examples of social responsibility. Explores the ethical dimensions of social responsibility and implications for equity. Develops a detailed analysis of the tradeoffs and ethical quandaries for businesses and individuals between the profit motive, customer satisfaction and civic responsibility.	ENCS 282 ENGR 201	ENGR 392 INSE 390	INSE 490		Project work Assignments Written examinations Case studies
		B	Explains social responsibility in nuanced terms. Provides detailed examples of real-life instances of social responsibility. Recognizes the ethical dimensions of social responsibility and some equity considerations. Considers tradeoffs and ethical quandaries which occur in the practice of social responsibility.					
		C	References examples of real-life instances. Explains social responsibility in simplistic terms. Mentions tradeoffs and ethical quandaries briefly. Mentions equity issues briefly.					
		F	Provides no examples of instances of social responsibility. Fails to explain social responsibility. Does not acknowledge the ethical or equity issues in social responsibility. Fails to explore the relationship between ethical behavior and social responsibility.					

Graduate attribute mapping for **Economics and Project Management.**

An ability to appropriately incorporate economics and business practices including project, risk and change management into the practice of engineering and to understand their limitations.

Indicators	Students can..	Rubrics		Level			Suggested assessment method
		Grade	Definition	Introduce	Develop	Apply	
Fundamentals of economics	<ul style="list-style-type: none"> • Make economic decisions. • Explain engineering costs. • Prepare and use cash flow diagrams. • Explain interest and equivalence. • Perform and use various economic analysis techniques. 	A	Outlines a basic plan considering value of money in decision making.	ENGR 301		INSE 490	Project work Assignments Written examinations Case studies
		B	Applies basic principles including one time versus recurring costs and return on investment in decision making.				
		C	Discusses economic principles in a broad or general way without relating to the actual project.				
		F	Makes no mention of economic principles.				
Economic evaluation of projects	<ul style="list-style-type: none"> • Perform economic assessment of projects. • Evaluate and select alternative projects. • Perform economic sensitivity analysis. • Perform economic risk analysis. • Carry out project cost estimation. 	A	Identifies all the requirements and associated resources and realistically assesses the scope, dimensions, scale of effort and indicative costs of an engineering project.	ENGR 301		INSE 490	Project work Assignments Written examinations Case studies
		B	Identifies some of the requirements and associated resources and realistically assesses the scope, dimensions, scale of effort and indicative costs of an engineering project.				
		C	Identifies some of the requirements and associated resources but not capable of assessing the scope, dimensions, scale of effort and indicative costs of an engineering project in a realistic manner.				
		F	Unable to identify requirements and associated resources and not capable of assessing the scope, dimensions, scale of effort and indicative costs of an engineering project in a realistic manner.				
Project planning and implementation	<ul style="list-style-type: none"> • Explain and select organizational structures. • Develop work breakdown structure. • Develop project schedules. • Perform network diagram analysis. • Identify critical paths. • Build teams and manage team dynamics. 	A	Presents an efficient, excellent plan; detailed budget; foresees and mitigates potential risks.	ENGR 301	INSE 390	INSE 490	Project work Assignments Written examinations Case studies
		B	Plans and efficiently manages time and money; regular meetings; safety considerations are clear.				
		C	Poor timeline or budget; infrequent meetings; minor safety problems.				
		F	No useful timeline or budget; missed meetings; inappropriate safety considerations.				

Graduate attribute mapping for Life-long Learning.

An ability to identify and to address his/her own educational needs in a changing world, sufficiently to maintain his/her competence and contribute to the advancement of knowledge.

		Rubrics		Level			
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method
Identifying missing knowledge and learning opportunities	<ul style="list-style-type: none"> Assess the problem and identify when knowledge is missing Identify sources to seek out necessary information Self-acquire necessary information from different sources 	A	Makes explicit references to previous learning and applies in an innovative (new and creative) way that knowledge and those skills to demonstrate comprehension and performance in novel situations. Identify when knowledge is missing and seek out sources to obtain the missing knowledge	INSE 351 MIAE 221	INSE 486	INSE 490	Project work Assignments Written examinations Case studies
		B	Makes references to previous learning and shows evidence of applying that knowledge and those skills to demonstrate comprehension and performance in novel situations. Identifies when knowledge is missing but may not fully acquire missing knowledge.				
		C	Makes references to previous learning and attempts to apply that knowledge and those skills to demonstrate comprehension and performance in novel situations. Shows some difficulty when faced with problems where knowledge is missing				
		F	Makes vague references to previous learning but does not apply knowledge and skills to demonstrate comprehension and performance in novel situations. Relies only on previous learning, without identifying missing knowledge				
Continuous improvement and self-learning	<ul style="list-style-type: none"> Continually seek out new knowledge Leverage available learning opportunities and knowledge sources to stay current 	A	Seeks out new information and latest developments	COMP 228 ENGR 201 ENGR 233 ENGR 301 INSE 445 MIAE 221		INSE 490	Project work Assignments Written examinations Case studies
		B	Keeps current periodically on some aspects and developments in the domain				
		C	Maintains little connection to external improvement and self-learning sources				
		F	Fails to pursue any resources or information outside of coursework				

Appendix 5: Needs Analysis, Surveys, Market Analysis, Environmental Scans

Please see in following pages:

1. Industry expert survey questionnaire and results
2. Undergraduate student interest survey findings and questionnaire
3. CEGEP student open house survey flyer and results
4. Cybersecurity specialist job posting analytics for Canada and Quebec

Section 1: Introduction

Thank you for agreeing to participate in our survey. Your insights are invaluable in shaping the cybersecurity undergraduate programs at Concordia University. This survey should take approximately 20-30 minutes to complete.

Respondent Information

Name	<input type="text"/>
Current job title	<input type="text"/>
Organization	<input type="text"/>
Core responsibilities (e.g., management, engineering, research)	<input type="text"/>

Please indicate the size of your organization.

- Small (1-99 employees)
- Medium (100-999 employees)
- Large (1,000-9,999 employees)
- Enterprise (10,000+ employees)

Please specify the primary sector or industry of your organization. If your organization operates in multiple sectors, indicate the one most relevant to your role.

Brief Description of the Programs

The Gina Cody School of Engineering and Computer Science at Concordia University is proposing to launch two new programs: a Bachelor of Engineering in Cybersecurity Engineering and a Bachelor of Science in Cybersecurity. Led by the Concordia Institute for Information Systems Engineering (CIISE), these programs aim to equip graduates with a solid foundation in computer science principles, complemented by in-depth and specialized knowledge in various facets of cybersecurity.

The main objective of the programs is to prepare students for a rewarding career in the fast-growing field of Cybersecurity. The programs will offer students a comprehensive body of knowledge, including cryptography, foundations for secure information systems, access control, security policies and security mechanisms, operating system security, network security, security vulnerabilities and malware defense, secure programming, blockchain technology, cybersecurity ethics, cybercrime investigations, privacy, etc.

The programs will also help students develop various cybersecurity skills, such as penetration testing skills, risk assessment and security management skills, security engineering skills, security monitoring skills, incident handling and forensic analysis skills, secure network management skills, regulatory compliance, and auditing skills.

Section 2: Market Demands

How likely do you think the market demand for cybersecurity related jobs will increase in the next five

years?

- Very likely
- Likely
- Unlikely
- Very unlikely

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

How would you assess the level of need for training and skill updating in cybersecurity-related roles within your organization? Please select the option that best represents your organization's situation.

- No need
- Low need
- Moderate need
- High need
- Critical need

Does your organization face challenges in recruiting skilled professionals specifically for cybersecurity roles?

- Yes
- No
- Unsure

If yes, What kinds of positions are most difficult to hire for, and what specific skills are most in demand?

How likely is your organization to subsidize the following types of education/training opportunities for employees?

	Very likely	Likely	Unlikely	Very unlikely
Professional certification or training program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Undergraduate certificate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Graduate certificate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very likely	Likely	Unlikely	Very unlikely
Graduate diploma	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bachelor of Engineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bachelor of Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 3: Program Accreditation

The proposed BEng in Cybersecurity Engineering will be a full-time 120-credit (four-year) program designed to be fully accredited by the Canadian Engineering Accreditation Board (CEAB). The curriculum consists of the cybersecurity engineering core courses, engineering core courses, technical electives, and general education elective courses. We are also considering offering a 90-credit (three-year) BSc in Cybersecurity program that does not require engineering core courses.

What cybersecurity related job roles in your organization require CEAB accreditation (suitable for BEng graduates)? Please list the job titles below.

What cybersecurity related job roles in your organization do NOT require CEAB accreditation (suitable for BSc gradates)? Please list the job titles below.

What would be the approximate percentage of cybersecurity related jobs within your organization that require CEAB accreditation?

- Less than 20%
- 21- 40%
- 41- 60%
- 61-80%
- More than 80%
- Unsure

Please provide any additional comments you have regarding jobs that require CEAB accreditation.

Section 4: Competencies Required

Please rank the following competencies in order of importance for a cybersecurity professional, using a scale from 1 to 6, where 1 is 'Not important' and 6 is 'Critically important'.

	Not important 1	Somewhat important 2	Moderately important 3	Important 4	Very important 5	Critically important 6
Technical proficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problem-solving skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ethical judgment and integrity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teamwork and collaboration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not important 1	Somewhat important 2	Moderately important 3	Important 4	Very important 5	Critically important 6
Continuous/lifelong learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If there are any additional competencies you believe are crucial for a graduate of our cybersecurity programs, please list them here and briefly explain why they are essential.

How important is interdisciplinary knowledge (e.g., legal, ethical, managerial) in the field of cybersecurity?

- Very important
- Somewhat important
- Somewhat unimportant
- Not at all important

Additionally, are there specific interdisciplinary areas you find most relevant for cybersecurity professionals?

Section 5: Curriculum Design

Based on your experience and industry perspective, what specific topics or areas should be emphasized in the program to prepare students for the evolving cybersecurity workforce?

What specific skills are currently in high demand within the cybersecurity job market that should be emphasized in the program?

Section 6: Industry Collaboration and Partnership Opportunities

What type(s) of experiential or work-integrated learning opportunities could your organization provide to students of our BEng/BSc Cybersecurity programs? Please select all applicable options.

- Course-based experiential learning/capstone projects (students work collaboratively to design or develop a solution to address a specific problem of interest to your organization, all within a single academic term, under the mentorship and guidance of a course instructor.)
- Onsite internships or Co-op placements
- Virtual internship
- Field projects
- Research collaborations
- Mentorship opportunities
- Job shadowing experiences
- Industry sponsored competitions or hackathons
- Live case studies or simulations
- Other (please specify):

Apart from the aforementioned experiential learning opportunities for students, what other forms of collaboration would your organization be interested in pursuing with our BEng/BSc Cybersecurity programs? These collaborations are intended to enhance program offerings and better align them with industry needs.

- Guest lectures and workshops from industry professionals
- Participating in program advisory committees
- Input into course/program design or content
- Joint research projects
- Facilitating networking events with industry experts
- Offering mentorship and career guidance to students
- Providing access to specialized tools or software for educational use
- Other (please specify):

Section 7: Industry Trends

What specific cybersecurity threats or challenges do you foresee becoming significant in the near future?



In your opinion, what are the current key trends in cybersecurity that our program should address? To the best of your knowledge, how do you anticipate the cybersecurity landscape changing in the next 5-10 years, and what impact might this have on the skills and knowledge required by professionals in this field?



Please share any additional comments, suggestions, or concerns you may have regarding the development of our Cybersecurity program.



Please click the next arrow button below when you are ready to submit your survey responses. Responses will only be recorded upon submission.

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Respondent Information

39 Responses

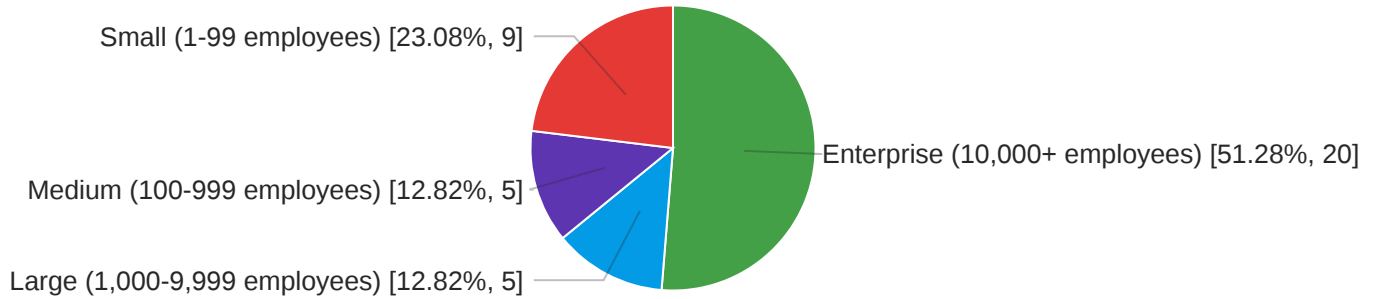
Name	Current job title	Organization	Core responsibilities (e.g., management, engineering, research)
Subhashish Chakravarty	Sr Eng Manager	Collins Aerospace	Engineering management and research
N/A	N/A	N/A	N/A
Alireza Arasteh	Head of Canada	Mandiant Consulting	Management
Bassam	Researcher	HQ	research and project management
Aurelian Constantinescu	Project Manager, Collaboration and Government Programs, and Academic Partnerships	CAE Inc.	Project management
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
Mohammad Faghani	Director of Managed Detection and Response	Accenture	Provide Managed Detection and Response services to clients
N/A	N/A	N/A	N/A
Steven Wang	Sr Director	Mistplay	Leadership of engineering teams
Boubakr	Researcher	Ericsson	R7D
CASAMIA	CEO	CREANCES ET SOLUTIONS	N/A
Remi Benito	Aircraft Cybersecurity	Bombardier	Engineering
Makan Pourzandi	Research Leader	Ericsson	Research
Warren Lee	Cybersecurity Leadership - GRC	Pratt and Whitney	Governance Risk and Compliance
Yosr Jarraya	Master Researcher	Ericsson	Research

Ribal Atallah	Cybersecurity Researcher	Hydro-Québec	project manager, cybersecurity research, AI research
Marthe Kassouf	Researcher	Hydro-Quebec	Project management and research
Bin Li	Senior Software Engineer	YMAX Communications Corp	Engineering
chen kuang	tech lead	Bell Flight	engineering
Heyang Zhao	Cybersecurity Specialist	Alstom	engineering
Plamen Hristov	Sr. Manager Internal Audit	CN Rail	management
Jerry Xiao	Manager	RdQCC LLC	Management
Julian Conte	Product Manager	Creo Solutions	Management, coordination, defining vision
N/A	N/A	N/A	N/A
Eric Chung	Manager	CAE Inc	Engineering Management
N/A	N/A	N/A	N/A
Andrée Robichaud- Véronneau	Senior Data Scientist	Ciena Corporation	Engineering
Olivier Henley	Embedded Engineer	Adacore	Emerging Markets
Layial El-Hadi	Executive Director	Fintech Cadence	Management
George Mastromonaco	V.P. Sales & Marketing	Ingenia Technologies Inc.	Sales Force Management and Product Manager
N/A	N/A	N/A	N/A
Will Edwards	Head of Cyber Services	SEL	Cyber Engineering
Fayi Zhou	Manager	EPCOR	Engineering plus Management
Hyame Alameddine	Senior Security Researcher	Ericsson	Security research

Marc-André Guérette	Director of Information Security	Rheinmetall Canada	Management
Aram Montazami	VP of R&D	Novatek International	Management of all R&D projects and teams
Wissem Maazoun	Vice-President of Innovation	BusPas Inc.	Engineering, Research
Umang Handa	Partner, National Leader, Cybersecurity as a Service	PwC	Lead Cyber as a Service for PwC Canada, Nationally
Hui Zhu	Research Scientist	Thales Group	Research and development
Mohamad El Hout	Founder	Houtech Consulting	Security consulting and headhunting
Marc Potvin	Project Engineer	Bba Inc.	Engineering
Luis Suárez	Researcher	Ericsson Research	Research 5G, 6G trust management
Patrick Jean-Baptiste	President	Sunphinx	Management
Roberto Pimentel	Director, Software Engineering	Raymond Chabot Grant Thornton	Engineering management + Sofotware Research and Development
Danial Jafarigiv	Cybersecurity Researcher	Hydro-Quebec Research Institute (IREQ)	Research

Q3 - Please indicate the size of your organization.

39 Responses



Q4 - Please specify the primary sector or industry of your organization. If your organization operates in multiple sectors, indicate the one most relevant to your role.

38 Responses

Please specify the primary sector or industry of your organization. If your organization operates in multiple sectors, indicate the one most relevant to your role.

Aerospace

Cyber Security Consulting

Power grids

Aerospace, Simulation

Technology Consulting

Mobile Gaming

Telecom

FINANCE

Business Aircraft OEM

Telecommunications

Aerospace

Telecom

Power utility

Power utility and energy

Telecommunication

Aerospace

rolling stock

transportation

Medical Device Industry

Construction technology

Defence & Security

Telecommunications

Aerospace and Aviation, Defense and Rails

Finance, tech and entrepreneurship (fintech)

Manufacturing HVAC equipment

Electric Utility

Utilities

Telecommunications

Defence

Software for Healthcare

Software development, Transportation

Digital Identity and Security

Consulting

Energy

telco

Cybersecurity Professional services

Financial Services

Power system

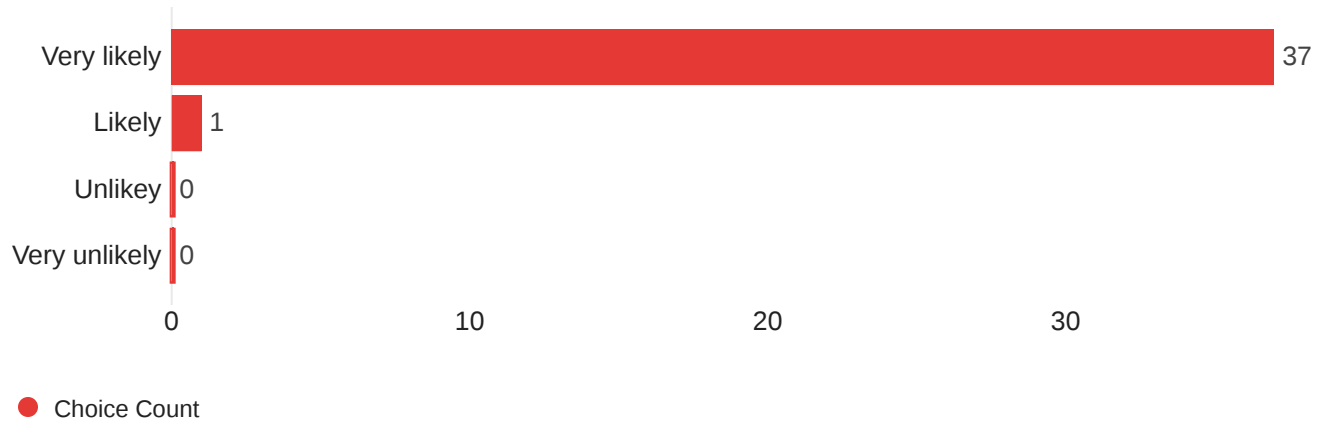
Q4 - Please specify the primary sector or industry of your organization. If your organization operates in multiple sectors, indicate the one most relevant to your role.

38 Responses



Q6 - How likely do you think the market demand for cybersecurity related jobs will increase in the next five years?

38 Responses



Q7 - What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

(Broken down by organization size)

33 Responses

Enterprise (10,000+ employees)

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

CISSP
Pen Tester
Cloud security

Researcher, security consultant

Incident Response Analyst, Risk and Compliance Analyst, Security Architect, Forensics Analyst, Vulnerability Management Analyst, Cybersecurity Advisor

All of them

IT/OT corporate network cybersecurity and aircraft cybersecurity (i.e. product security).

Researcher in cyber security, security operations for security operational centers, vulnerability testers, security administrators, developers for security aspects of Telecom systems.

Information System Security Officer
 Compliance Professional
 Resiliency Manager
 Risk Manager
 Firewall Engineer
 Security Engineer

Cybersecurity consultant, IT cybersecurity expert, OT cybersecurity expert, cybersecurity researcher

Cybersecurity specialists for power grid operations (IT and OT systems) and cybersecurity researchers

cybersecurity analyst, cybersecurity engineer, cybersecurity specialist, project manager of cybersecurity

IT Auditor, Security architecture, OT security specialist/architect, CSOC specialist, Network Security Engineer, GRC

System/Software Specialist

Senior Threat Detection Engineer, 5G cybersecurity Architect, Security solution architect, Digital Forensic Specialist

Software Engineer, AI Algorithm Engineer, System Engineer, Cyber Security Engineer, Security IT Engineer, Cloud Security Engineer, Security Analyst, Cyber Security Architect, Data Scientist, Research Scientist, Project Manager, Solution Manager, Maintenance Technician

chief information security officer

These are the available jobs only in our sector (Research Institute):

1. Cybersecurity researcher (multidisciplinary) including quantum cybersecurity
2. Senior specialist for Operational Technology (OT) cybersecurity

Medium (100-999 employees)

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Sr Director of cybersecurity, director of cybersecurity

Around 100 software engineers.

We make toolchains addressing DO-178B/C, EN 50128, ISO 26262, IEC 61508, ECSS-E-ST-40C & ECSS-Q-ST-80C, and MIL-STD-498.

We develop the Ada and the SPARK subset, which is the only formally verified programming language system (compiled to native instructions) that is industrial-ready.

IT Manager

Security Analyst, Architect

Small (1-99 employees)

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

System admin, IT professional, Software Engineer

Product Security Engineer, Senior Principal of Cybersecurity, Data Protection Leader

Software development
Software architecture
Managing, protecting client data

Data management and storage

IT Management, IT Specialist, Security Officer

Software development, Researcher

Security consultant

Cloud, SOC Analyst

Large (1,000-9,999 employees)

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Cyber Security Engineer, Cyber Security Tester

Software developer, IT analyst

Project Engineer, Technical Sales, Product Development Software and Hardware Engineers, Security Analyst, Network Engineer

IT, Operational staff who Operation and Maintain Water, Electricity and Wasetwater facilities

ICS/OT Cybersecurity

Q7 - What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

(Broken down by sectors)

33 Responses

Aerospace

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

CISSP
Pen Tester
Cloud security

Information System Security Officer
Compliance Professional
Resiliency Manager
Risk Manager
Firewall Engineer
Security Engineer

Cyber Security Engineer, Cyber Security Tester

Power grids

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Researcher, security consultant

Aerospace, Simulation

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Incident Response Analyst, Risk and Compliance Analyst, Security Architect, Forensics Analyst, Vulnerability Management Analyst, Cybersecurity Advisor

Mobile Gaming

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Sr Director of cybersecurity, director of cybersecurity

Telecom

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

All of them

Business Aircraft OEM

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

IT/OT corporate network cybersecurity and aircraft cybersecurity (i.e. product security).

Telecommunications

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Researcher in cyber security, security operations for security operational centers, vulnerability testers, security administrators, developers for security aspects of Telecom systems.

Power utility

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Cybersecurity consultant, IT cybersecurity expert, OT cybersecurity expert, cybersecurity researcher

Power utility and energy

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Cybersecurity specialists for power grid operations (IT and OT systems) and cybersecurity researchers

Telecommunication

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

System admin, IT professional, Software Engineer

rolling stock

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

cybersecurity analyst, cybersecurity engineer, cybersecurity specailist, project manager of cybersecurity

transportation

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

IT Auditor, Security architecture, OT security specialist/architect, CSOC specialist, Network Security Engineer, GRC

Medical Device Industry

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Product Security Engineer, Senior Principal of Cybersecurity, Data Protection Leader

Construction technology

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Software development
Software architecture
Managing, protecting client data

Defence & Security

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

System/Software Specialist

Telecommunications

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Software developer, IT analyst

Senior Threat Detection Engineer, 5G cybersecurity Architect, Security solution architect, Digital Forensic Specialist

Aerospace and Aviation, Defense and Rails

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Around 100 software engineers.

We make toolchains addressing DO-178B/C, EN 50128, ISO 26262, IEC 61508, ECSS-E-ST-40C & ECSS-Q-ST-80C, and MIL-STD-498.

We develop the Ada and the SPARK subset, which is the only formally verified programming language system (compiled to native instructions) that is industrial-ready.

Finance, tech and entrepreneurship (fintech)

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Data management and storage

Manufacturing HVAC equipment

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

IT Manager

Electric Utility

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Project Engineer, Technical Sales, Product Development Software and Hardware Engineers, Security Analyst, Network Engineer

Utilities

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

IT, Operational staff who Operation and Maintain Water, Electricity and Wasetwater facilities

Defence

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Security Analyst, Architect

Software for Healthcare

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

IT Management, IT Specialist, Security Officer

Software development, Transportation

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Software development, Researcher

Digital Identity and Security

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Software Engineer, AI Algorithm Engineer, System Engineer, Cyber Security Engineer, Security IT Engineer, Cloud Security Engineer, Security Analyst, Cyber Security Architect, Data Scientist, Research Scientist, Project Manager, Solution Manager, Maintenance Technician

Consulting

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Security consultant

Energy

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

ICS/OT Cybersecurity

Cybersecurity Professional services

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Cloud, SOC Analyst

Financial Services

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

chief information security officer

Power system

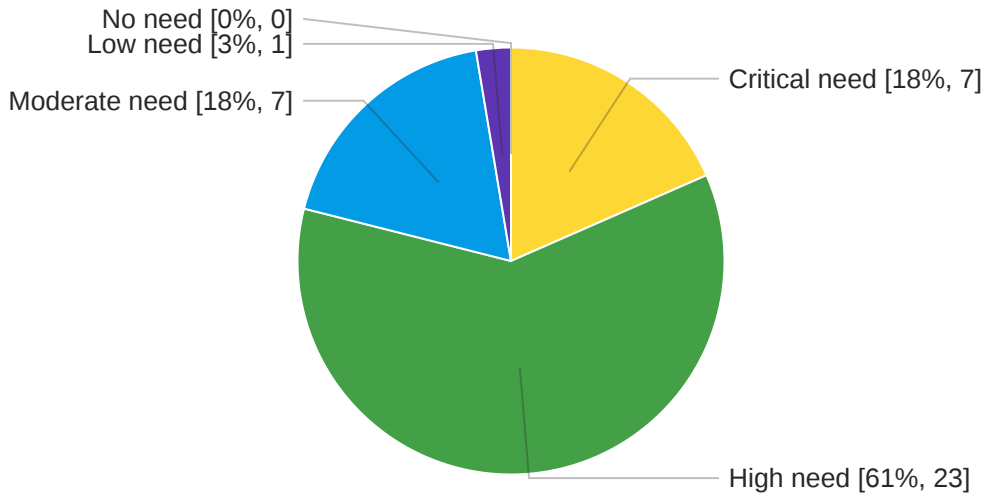
What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

These are the available jobs only in our sector (Research Institute):

1. Cybersecurity researcher (multidisciplinary) including quantum cybersecurity
2. Senior specialist for Operational Technology (OT) cybersecurity

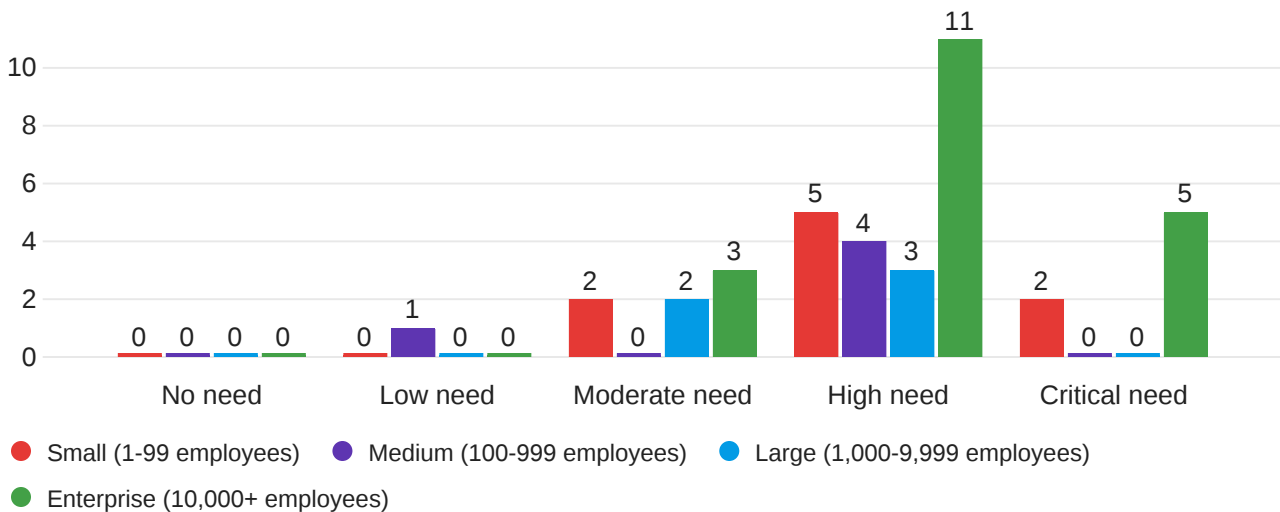
Q8 - How would you assess the level of need for training and skill updating in cybersecurity-related roles within your organization? Please select the option that best represents your organization's situation.

38 Responses



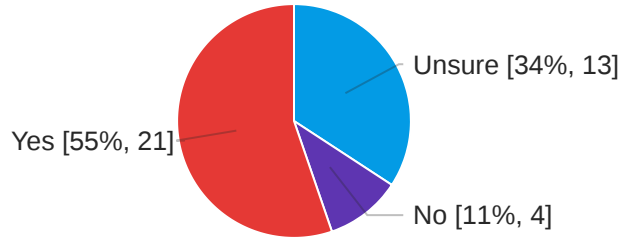
Q8 - How would you assess the level of need for training and skill updating in cybersecurity-related roles within your organization? Please select the option that best represents your organization's situation. **(Broken down by organization size)**

38 Responses



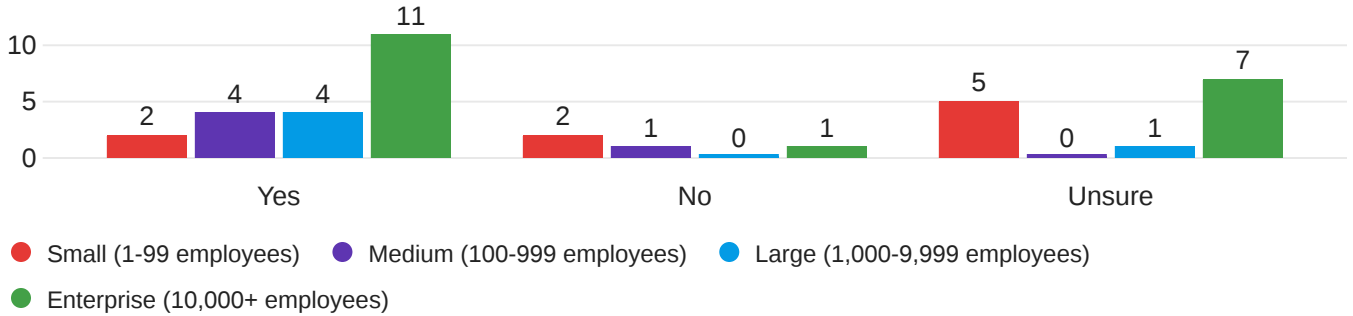
Q9 - Does your organization face challenges in recruiting skilled professionals specifically for cybersecurity roles?

38 Responses



Q9 - Does your organization face challenges in recruiting skilled professionals specifically for cybersecurity roles? (Broken down by organization size)

38 Responses



Q9 - Does your organization face challenges in recruiting skilled professionals specifically for cybersecurity roles? (Broken down by organization size)

38 Responses

Field	Small (1-99 employees)	Medium (100-999 employees)	Large (1,000-9,999 employees)	Enterprise (10,000+ employees)
Yes	2	4	4	11
No	2	1	0	1
Unsure	5	0	1	7

Q10 - If yes, What kinds of positions are most difficult to hire for, and what specific skills are most in demand?

21 Responses

If yes, What kinds of positions are most difficult to hire for, and what specific skills are most in demand?

Expert IR or Penetration testing resources, and security engineers

Incident Response Analyst, Risk and Compliance Analyst, Security Architect, Forensics Analyst

Most difficult to hire: Having knowledge in both aircraft systems and cybersecurity.

security experts for running operational security, vulnerability testing and management

cybersecurity researcher with power background

IT security specialists, and cybersecurity professionals for industrial control systems

Avionics and Cyber Security knowledge

cybersecurity engineer, project manager of cybersecurity. Organization is looking for someone who understands the cybersecurity concepts, best practices, auditing, and be able to make decision regarding project cybersecurity requirements and technology.

Security Architecture, OT security, GRC, IT Auditor

Product Security Engineer who is able to take care of Security Risk Analysis, Security Regulations, and privacy tasks

Cybersecurity for Operational Technology for Defence & Security programs that require ITAR, Controlled Goods and NATO Secret (or higher)

Engineers with expertise in low-level programming and system-level concerns are becoming increasingly scarce in the industry. Certification engineers are scarce too.

IT Network managers with knowledge in Cybersecurity

Industrial Control System experience with cybersecurity expertise is desired and very rare.

network security specialist. Skills such as scripting, control and framework, intrusion detection

Architect

Cloud development

Cyber Security Engineer, Software Engineer, System Engineer

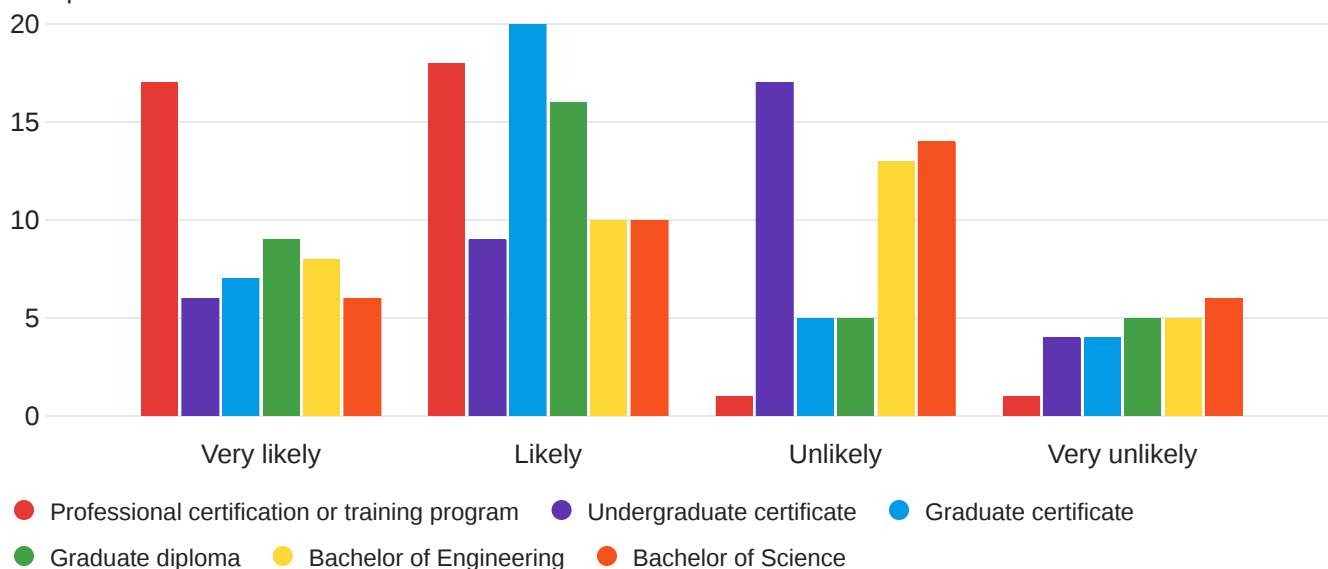
ICS/OT Cybersecurity or Cyberphysic

Architecture and SOC analyst

Multidisciplinary knowledge applications for the cybersecurity analysis (Power system, communication network, computer programming/science)

Q11 - How likely is your organization to subsidize the following types of educati...

38 Responses



Q11 - How likely is your organization to subsidize the following types of educati...

38 Responses

Field	Very likely	Likely	Unlikely	Very unlikely
Professional certification or training program	17	18	1	1
Undergraduate certificate	6	9	17	4
Graduate certificate	7	20	5	4
Graduate diploma	9	16	5	5
Bachelor of Engineering	8	10	13	5
Bachelor of Science	6	10	14	6

Q13 - What cybersecurity related job roles in your organization require CEAB accreditation (suitable for BEng graduates)? Please list the job titles below.

33 Responses

What cybersecurity related job roles in your organization require CEAB accreditation (suitable for BEng graduates)? Please list the job titles below.

Avionics Cybersecurity Researcher
Cybersecurity researcher
Embedded Cyber Researcher

Associate roles for

Incident response consultant
Red team consultant
Strategic cyber security consultant

None

I wouldn't say any job role requires a CEAB accreditation for my organization

/

Don't know

Security operational personal, developers with security background, vulnerability testers, security architects

P&W Canada Product Security team

No data

N/A

Electrical and computer engineering

System admin, Software engineer

cyber security engineer / designer

Cybersecurity Engineer

security architecture
difficult to say for the rest as industry certifications and experience is primary asset

product security engineer

None at the moment

System/software specialist

Not sure about requirements

- Software/Embedded Engineers
- Certification Engineers

NA

None

None

IT network specialist and general software and hardware engineering

Architect

Security officer, IT specialist.

System engineers, Cloud architect, AI developer, Data engineers

None

Any technical and engineering position

None.

ICS/OT Cybersecurity Engineer

I dont know

Penetration Tester
Security Software Developer
Incident Response Analyst
Network security engineer
OT security engineer
Cloud security engineer
IT/OT Auditor

Q14 - What cybersecurity related job roles in your organization do NOT require CEAB accreditation (suitable for BSc gradates)? Please list the job titles below.

32 Responses

What cybersecurity related job roles in your organization do NOT require CEAB accreditation (suitable for BSc gradates)? Please list the job titles below.

Senior roles for

Incident response consultant
 Red team consultant
 Strategic cyber security consultant

All

Any cybersecurity role e.g. Cybersecurity analyst

/

Don't know

Security researchers

P&W cybersecurity requires a bachelor's degree. Cybersecurity related certifications are preferred.

No data

consultant, expert, researcher

Cybersecurity specialist for IT systems and for operational technologies (OT) applied to power grids

IT professional

cyber security tester / technician

Cybersecurity analyst, cybersecurity specialist, project manager of cybersecurity

most of security related jobs, as I mention industry certifications like CISSP, CISM, CISA and the like of more of an asset

Product Security Manager

Software architect
 Full stack developer
 Cloud security specialist

N/A

Not sure about requirements

Hard to say. None?

NA

Programmers

Project Engineer, HW/SW Product Development, Security Analyst, Network Engineer

lab technologist and plan operators

Analyst

None

NA

All of the roles we hire for

Unsure

Any. The focus for cybersecurity is on experience and ability to learn new technologies and frameworks.

ICS/OT Cybersecurity professional

Chief Information Security Officer

Risk Analyst

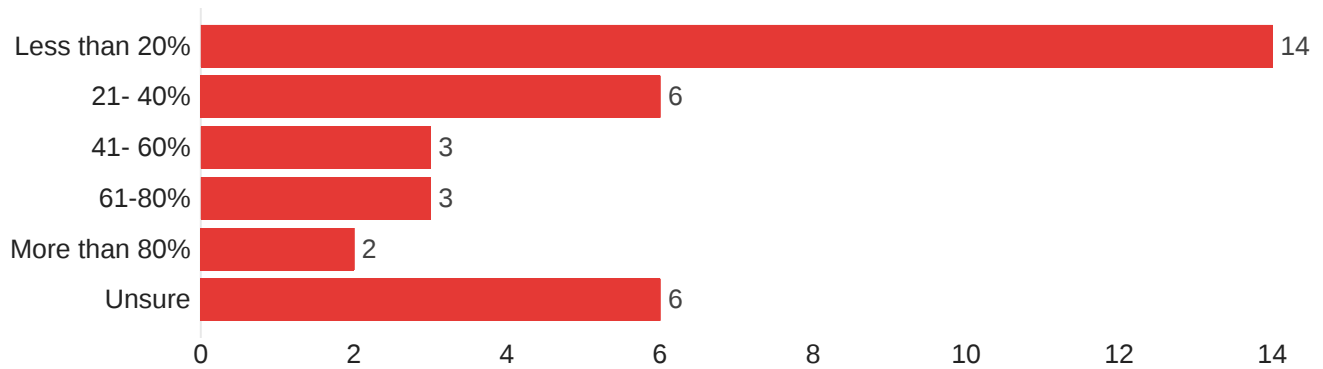
Security Consultant

Security Architect

Data Security Strategist

Q15 - What would be the approximate percentage of cybersecurity related jobs within your organization that require CEAB accreditation?

34 Responses



● Choice Count

Q16 - Please provide any additional comments you have regarding jobs that require CEAB accreditation.

11 Responses

Please provide any additional comments you have regarding jobs that require CEAB accreditation.

N/A

We don't make a specific need for CEAB accreditation in any role at my company

/

No data

We are a US company and will not mandate the use of the CEAB issued by the Canadian government, but it can be used as a reference.

While we don't hire many cybersecurity experts internally, we support our startups by hiring and integrating cybersecurity people in their teams. Those roles include:

IT & Cyber Risk and Control Analyst
 Compliance Analyst, AML
 DevOps Engineer
 Full Stack Developer
 Security Specialist- Solutions and Assessments
 Security Engineer
 Client Implementation Specialist
 Compliance Supervisor, AML
 Lead Network and Security Engineer
 Lead Developer - Web Technologies
 IT Infrastructure Engineer

Accredited degrees are desirable but can be substituted with experience and expertise currently.

n/A

An accredited degree definitely helps the student compete for the job.

Involve safety & security risk assessment

The program should offer a trajectory for students to acquire multidisciplinary knowledge pertinent to positions requiring CEAB accreditation!

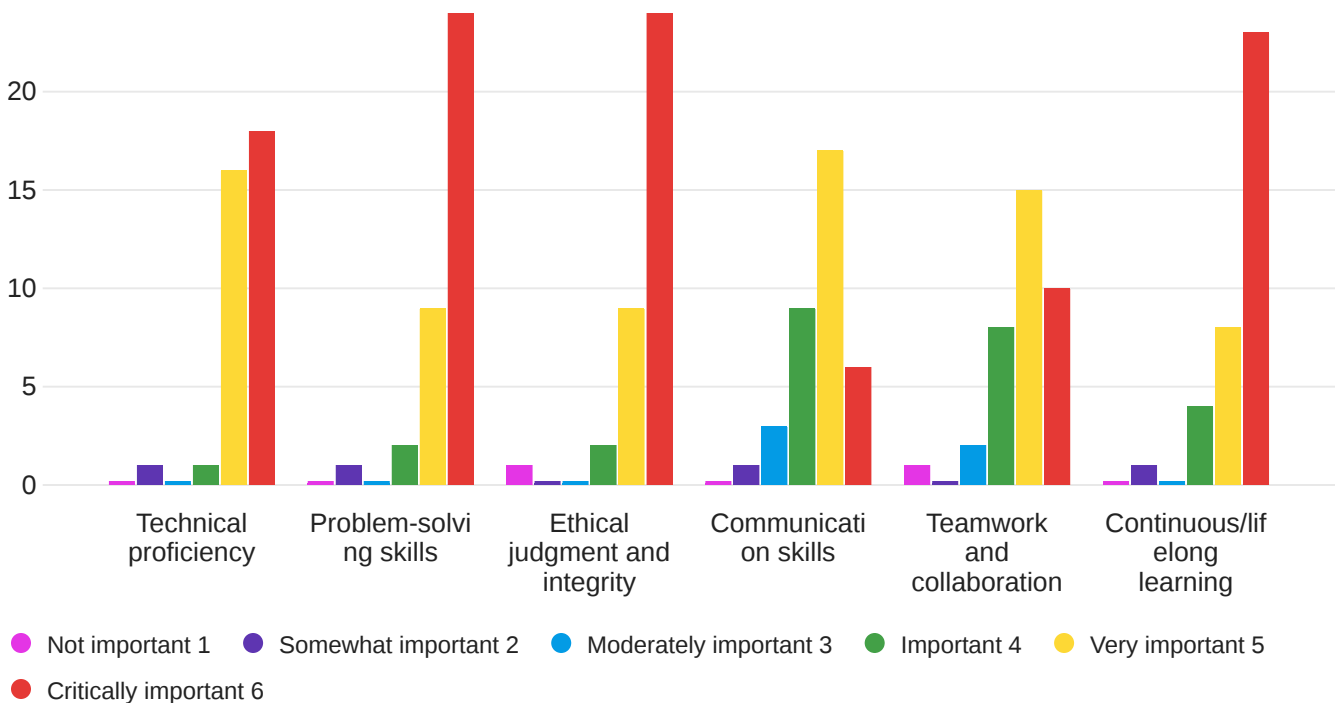
Q17 - Please rank the following competencies in order of importance for a cyberse...

36 Responses

Field	Not important 1	Somewhat important 2	Moderately important 3	Important 4	Very important 5	Critically important 6
Technical proficiency	0	1	0	1	16	18
Problem-solving skills	0	1	0	2	9	24
Ethical judgment and integrity	1	0	0	2	9	24
Communication skills	0	1	3	9	17	6
Teamwork and collaboration	1	0	2	8	15	10
Continuous/lifelong learning	0	1	0	4	8	23

Q17 - Please rank the following competencies in order of importance for a cyberse...

36 Responses



Q18 - If there are any additional competencies you believe are crucial for a graduate of our cybersecurity programs, please list them here and briefly explain why they are essential.

17 Responses

If there are any additional competencies you believe are crucial for a graduate of our cybersecurity programs, please list them here and briefly explain why they are essential.

N/A

Understanding of the domain where is applied cybersecurity (e.g. avionic domain, ..) and specially in OT environments where old legacy systems coexist with new systems and where availability is the first priority.

the students should have also good programming skills and knowledge about software development. This is necessary to be able to understand software developers and interact with them to design security in the software.

Project Management skills (i.e. ITIL)
Industry cybersecurity frameworks (ISO 27001/NIST 800-53/etc)

Factual decision making,

It is critically important for a cybersecurity professional working in an industrial control system environment to have a multidisciplinary training including a minimal technical proficiency in OT and system control and automation.

proficiency in avionics and fundamental knowledge for aircraft system design

Technical report writing: to documents the finding/ analysing of cybersecurity problems/ testing.
Priority/ time management: facing multiple tasks/ multipl projects is often the case, the need of managing priorities is something I learned after graduation.

A co-op may be very helpful.

Innovation:

- Mindset of continuous improvement
 - The ability to look at problems in new ways or anticipate new problems and develop novel solutions
- The methods of cyber attacks are evolving rapidly and require more than just reacting. We need to be proactive in our solutions, especially for mission and safety critical systems.

As an AdaCore engineer, my perspective isn't about promoting my company or our languages for personal gain but rather about sharing a critical insight into the cybersecurity field. The reality is that simply patching traditional, inherently loose system-level programming languages, isn't enough for robust cybersecurity. These languages often leave new professionals lost and overwhelmed by a myriad of idioms, falsely boosting their confidence while masking their true skill level. Many of my graduating students believe they are somewhat coding wizards, but in reality, they're making simple tasks complicated. Additionally, burying future professionals in layers of process and protocol is a misguided approach.

From my vantage point, seeing mission-critical, industrial applications of Ada and SPARK, it's clear these tools offer something unique - rigor, clarity, and inherent processes that other technologies simply can't match. They've been refined over decades by the brightest minds in the field. For a cybersecurity program to be credible and effective, it must teach these languages as foundational elements. Ada and SPARK don't just teach coding; they instill a mindset of precision and reliability essential for the future of cybersecurity. May I remind you that SPARK is formally provable of runtime defects to the point that removal of runtime checks and optimization can be pushed to surpass C performances: this is huge.

NA

able to quickly learn the nature of the business they are supporting, which means strong analytical skills

Machine learning and artificial intelligence

Searching skills (many students do not know how to find and search for the needed information)

NA

Identity and Access management (PAM, IGA, CIAM)

Data Loss Prevention (Data discovery, classification, remediation)

DevSecOps/Automation

Detection Engineering

Detection investigation

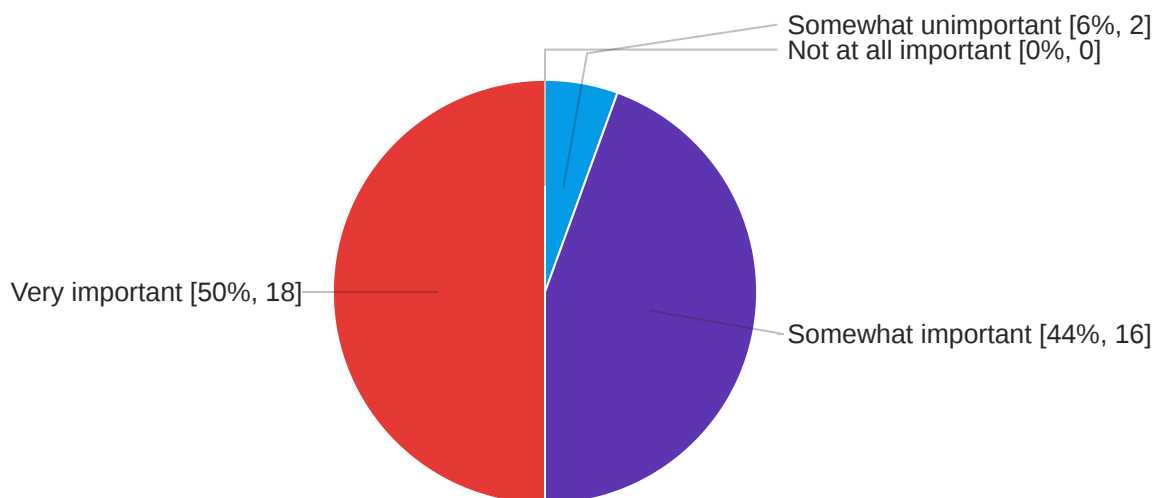
Response and recovery from cyber attack

Cyber compliance and regulations

Learning more about Operationa Technologies such as Industrial Control Systems and also biomedical appliances/equipments

Q19 - How important is interdisciplinary knowledge (e.g., legal, ethical, managerial) in the field of cybersecurity?

36 Responses



Q20 - Additionally, are there specific interdisciplinary areas you find most relevant for cybersecurity professionals?

19 Responses

Additionally, are there specific interdisciplinary areas you find most relevant for cybersecurity professionals?

Machine Learning

N/A

Should add the discipline of "communication", e.g. how an organization can manage the communication to the outside (media, shareholders, ..) in case of a cyberattack,.

Legal aspects of security are important to be understood by the students to be able to judge the necessity actions.

IT

Requirement management; business analysis; project management

it really depends on the role, the more technical the role the less need for interdisciplinary competencies

risk assessment

Legal implications of data breaches

NA

Automation and networking

N/A

Exposure to different new technologies and related threat vectors such as telecommunication networks, cloud infrastructure, network function virtualization and software defined networking and all their related management frameworks. Further the role of machine learning and artificial intelligence in cybersecurity, mainly to automate and enforce cybersecurity but also exposure to threats that can target them

Privacy, Engineering, Legal

NA

Software engineering, artificial intelligence

Risk & Vulnerability management, Ethical/Integrity, Health & Safety, Machine safety, Process Safety, Environmental impact, Operational consideration on ICS (integrity, availability, etc.)

Software System Architecture, Design and Engineering

1. Computer Science and Information Technology,
2. Networking: comprehend the architecture and vulnerabilities of networks,
3. Cryptography,
4. Data Analytics,
5. Operation Technology (OT) including Industrial Control Systems (ICS)

Q21 - Based on your experience and industry perspective, what specific topics or areas should be emphasized in the program to prepare students for the evolving cybersecurity workforce?

33 Responses

Based on your experience and industry perspective, what specific topics or areas should be emphasized in the program to prepare students for the evolving cybersecurity workforce?

Fuzzing, CPS, MBSE

Application security
Modern Architecture Frameworks and Security engineering

Artificial intelligence, cloud computing

Cloud security, knowledge of how major cloud providers work e.g. AWS, GCP, Azure

DevSecOps, Cloud Native security (k8s)

Problem Solving
Learn how to Think
Think out the Box

In addition to the traditional topics of cybersecurity, the program should include acquiring knowledge in AI/ML and quantum computing (i.e. post-quantum cryptography, ...)

vulnerability testing and operational security, system hardening, application security, software security development, knowledge about different malware, network security. Programming skills also should be taught as it has become the basic way to program security appliances and for implementing the right way as a built-in security in the applications.

Business functional interdependencies - IT Architecture, Legal - Global Trade, Factory Operational Technologies, IOT

Zero-trust, Quantic computing impact on security, Automation, AI/ML,

IT cybersecurity practices, OT cybersecurity practices, multi-disciplinary background

Critical infrastructure technologies in general (including computer networks, telecommunications, control systems, etc.) as well as social engineering techniques

Threat prevention, discovery, and recovery. Ways to utilize AI in cybersecurity.

1. understand the industrial standard and best practice
2. analysis and design knowledge
3. security measurement and objective verification process

Hand-on projects: OS commands; networking and cloud configuration; coding. Encourage students to participate in events like CTF.

Risk identification and assessment, threat identification, security governance

for our medical device industry, strong professional skilled in U.S. Food and Drug Administration (FDA), Verification and Validation (V&V), Systems Testing and Security Risk Analysis, Security Regulations, privacy, and Corrective and Preventive Action (CAPA) are very important.

Cybersecurity laws

Cloud security

Data science

Protection of legacy systems.

Integration of systems with different levels of security and cybersecurity resiliency.

Big Data safety concerns, Employee training on how to avoid breaches, Data privacy concerns

Low-level architecture and coding. They need to be very strong. Devices, drivers, OS services and architecture, allocators, network stacks, core protocols, bounded data structures, resource ownership and management, etc.

When writing code make sure it is completely safeguarded

Industry specific lab modules such as Energy Sector testbed where students get experience with threat hunting, configuration, disaster recovery, etc. on a practical level. Documentation is a very important skill for helping visualize dataflows, architecture diagrams, security plans, test procedures, etc.

Trust management (concept of zero trust)

MITTRE framework

Data protection acts. Legal requirements. Threat prevention

Communication systems, Systems security

Identity and Access management (PAM, IGA, CIAM)

Data Loss Prevention (Data discovery, classification, remediation)

DevSecOps/Automation

Detection Engineering

Detection investigation

Response and recovery from cyber attack

Cyber compliance and regulations

artificial intelligence

Q22 - What specific skills are currently in high demand within the cybersecurity job market that should be emphasized in the program?

31 Responses

What specific skills are currently in high demand within the cybersecurity job market that should be emphasized in the program?

AI/ML, MBSE

Incident response
Penetration testing
Application security
Security engineering

Amazon web services (AWS), Microsoft Azure, generative AI

Cloud security & knowledge of cloud computing platforms, knowledge of software development lifecycle (shift left security)

Cloud native security (k8s)

Threat hunting

As the demand is more crucial today to expand cybersecurity knowledge for the small and midsize enterprises (SME), I should expect the program to be easily applicable to the SME job market.

vulnerability testing and operational security, system hardening, application security,

Vulnerability Management, Insider Threat, Incident Response, System Incident & Event Management, Change Management, Compliance, Risk Management

No data

AI for cybersecurity

Artificial intelligence, simulation of industrial control systems and communication networks, advanced communication technologies, quantum technologies

How to monitor the system to identify security breach.
How to recovery from security breach.

Test design and simulation skill

cybersecurity concepts, networking configuration, cloud security implementation, writing and auditing codes, reading and creating documentations.

Regulations and standards shall be emphasized

Cloud security
Threat response
Risk management

Network routing (knowing what port scanning, low level mechanism of access are), web design and security (SQL injection)

We have the Nvidia Automotive and Security division looking to staff, with me personally, new engineers proficient in SPARK.

Key skills can include: comprehending complex technical matters, documenting security certifications, conducting risk assessments, researching and implementing new security solutions, analyzing weaknesses, and collaborating with vendors to foster a culture of cybersecurity awareness.

Effective communication

Vulnerability Assessments, Networking (switches, routers, firewalls), Forensic Analysis, Threat detection, System Architecture, Threat Modeling, Infrastructure Services (Active Directory, Domain Controller, Radius Server, Log Collection, Virtualization, etc.)

threat intelligence, social engineering, mobile device security, cloud security, data protection, risk assessment, etc. to name a few. Communication skill training is also a must

Incident management and response
Vulnerability management
Pen testing
Ethical hacking
Scripting languages and coding skills

Threat prevention and mitigation. Data privacy acts and their requirements in case of incidents. Tool and required measures for prevention of incidents.

ML systems and AI

AI development skills; Software development methodologies (like DevOps or DevSecOps); Communication skills

Cloud security, Network Security (firewalls, load balancers, proxies, vpn gateways), knowledge of security frameworks, some automation/python skills.

Knowledge of Industrial Control Systems and considerations related to these systems (risks, safety, physical security, cybersecurity, operability, system integrity, availability, etc.)

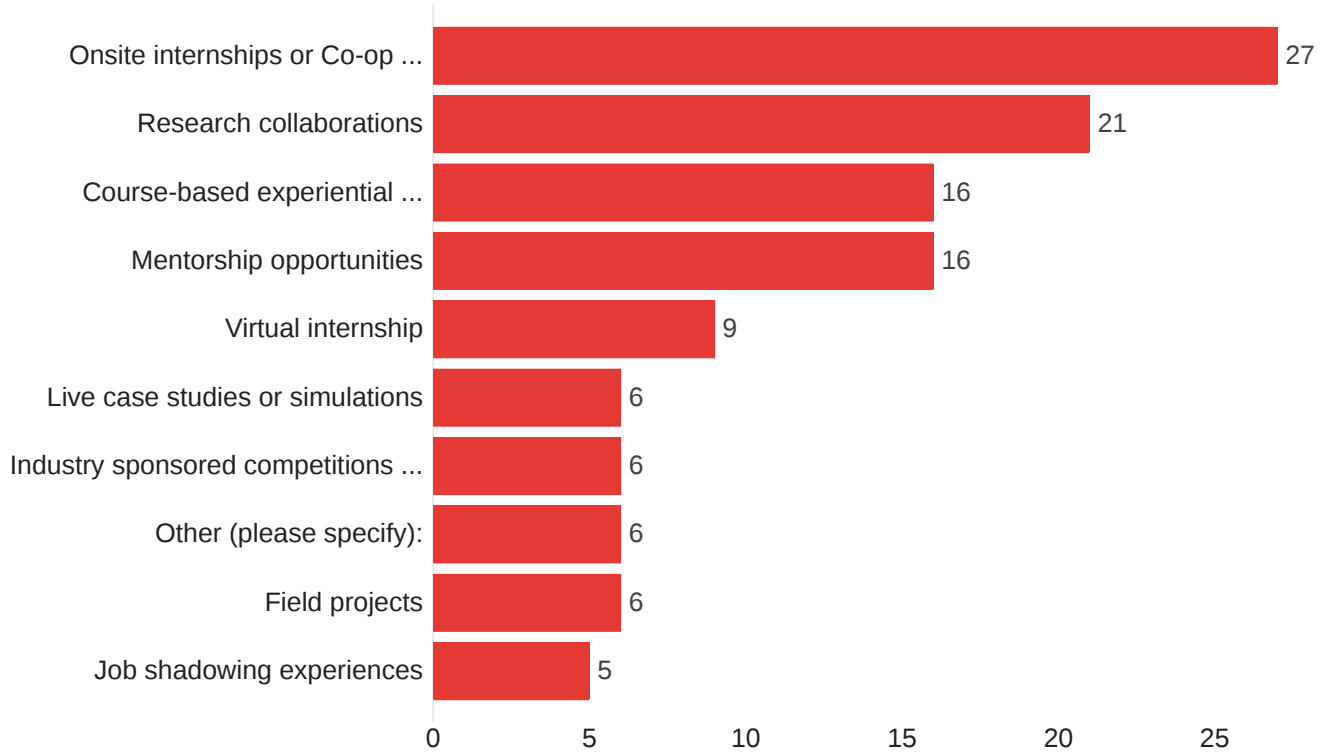
SOC Analyst and cloud

IT and Networking Skills and Threat Intelligence Skills

Q23 - What type(s) of experiential or work-integrated learning opportunities could your organization provide to students of our BEng/BSc Cybersecurity programs? Please select all applicable options.

- Selected Choice

35 Responses



Q23_7_TEXT - Other (please specify): - Text

6 Responses

Other (please specify): - Text

We're not currently offering any of this opportunities.

Entry-level certificates

perhaps few of the others above as well

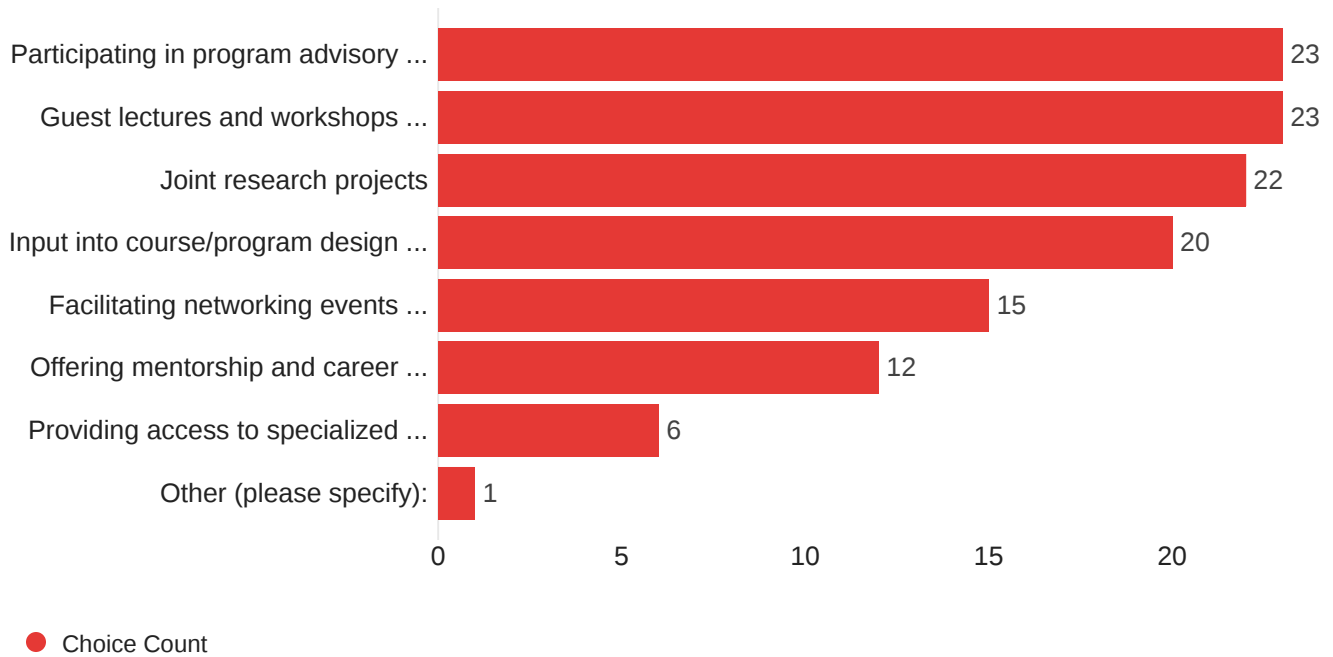
Connecting them to our startups who are hiring for internships or placements.

ICS Cybersecurity Bootcamps

Short term based assignments

Q24 - Apart from the aforementioned experiential learning opportunities for students, what other forms of collaboration would your organization be interested in pursuing with our BEng/BSc Cybersecurity programs? These collaborations are intended to enhance program offerings and better align them with industry needs. - Selected Choice

35 Responses



Q24_6_TEXT - Other (please specify): - Text

1 Responses

Other (please specify): - Text

We're not currently offering any of this opportunities.

Q25 - What specific cybersecurity threats or challenges do you foresee becoming significant in the near future?

32 Responses

What specific cybersecurity threats or challenges do you foresee becoming significant in the near future?

People retention and talent management

Supply chain attacks, cloud & cloud native security

TH and IR

Increasing usage of AI in future cyber threats and usage of quantum computing. Need to be more resilient to cyberattack (the question today is not if but when it will happen, ..)

attacks toward cyber critical infrastructure, enterprise attacks (e.g., ransomware), industrial and political espionage

Generative AI Deep Fakes, Spear Phishing, Smishing, all forms of social engineering

AI powered attacks
quantum-AI powered attacks

Challenges related to the expected integration of quantum computing, IoT and industrial IoT, and EDGE computing.

How to deal with AI in the cybersecurity space.

cyber security in aerospace industry

AI technology to substitute the entry-level cybersecurity professionals; The trend to migrate to cloud and the shortage of professionals that understand cloud security.

growth of AI usage by threat actors

data breach, hacker attack, cloud security, regulatory compliance.

Cloud attacks
IoT hacking

Increasing exposure of legacy systems due growing interconnectivity.

The use of AI to exploits in systems.

Data privacy concerns, AI-generated phishing attempts, AI-generated voice fakes, deep fakes scams.

Covert Breaches. Considering the thousands of CVEs (Common Vulnerabilities and Exposures) we've identified, it's alarming to think about the vast number of dormant or non-publicized vulnerabilities affecting closed-source and open-source systems.

NA

Cyber Ransomware

Distributed Energy Resources and Electric Vehicles will create an attack surface that we are not ready to manage.

cloud security since more and more data are migrating to cloud

I foresee an expansion of threats targeting physical infrastructure that leverage the cloud by exploiting virtualization technologies. Threats exploiting IoT devices are also likely to increase with the increase of the number and type of these devices and their related vulnerabilities. Further, threats exploiting different protocols of the OSI model will continue to exist, especially those related to the application layer that are usually overlooked.

Countering more sophisticated ransomware and threat using AI tools.

Communications protocol and data engineering

Technology: With the advent of AI, problem solving skills will be key for cybersecurity professionals. Three hyperscalers: Microsoft, Google and Amazon will take lion share of the market. Software development and coding skills will be very important in cyber

People: I see a number of professionals entering the market, however, not having the proper training/skillset to execute the job. The quality of students graduating in this space is key

Cybersecurity threats to cloud computing.

With more focus on cloud security, I'm seeing less and less focus on on-site security tools. There will probably be a shortage of such skills in few years.

Significant lack of ICS/OT cybersecurity professional in the next 3 to 5 years.

larger network footprint.
attacks i the wild, not detected

Cybersecurity Innovation

Supply chain compromise of software dependancies. Advent of AI-aided highly sophisticated attacks. Loss of privacy.

AI-based cyberattacks, Transitioning to Quantum-Safe Encryption, Monitoring and Detection: correlation algorithms for IT/OT events/logs to detect the cyberattacks in real-time

Appart of all technological, legal and ethical aspect of cybersecurity, the next challenge will be how to face the increasing threat of social engineering with the developement of the AI tools (ChatGPT, ...) that will come with social media manipulation and privacy issues.

I personally believe the attacks on infrastructure in general are going to increase. So, there is an increasing need for experts but also a higher degree of automation and AI/ML usage to address the lack of security professionals.

cybersecurity data analytics, AI development for cybersecurity purposes (i.e. event management), Factory cybersecurity, Network segmentation

With the recent advancements in AI, quantum computing, and cybersecurity, the threat landscape is evolving very quickly. Industries such as power utilities are forced to evolve and adapt their cybersecurity practices. As a result, cybersecurity professionals have to be aware of the AI advancements and their impact on cybersecurity approaches and practices. They also need to be experts in the system model that they are protecting (Informational/Operational Technology)

Cyberattacks against critical infrastructures are expected to become more frequent and more severe. The tools and the knowledge needed to understand the potential impact of such attacks as well to design, perpetrate and mitigate them should be provided to students as of undergraduate programs. In this context, the establishment of multidisciplinary training programs that prepare skilled workforce is highly required.

With the rapid development of AI, we'll probably see its usage on both sides of the issue. It'll be interesting and important for the students to know to deal with that.

the maturity of the industrial standard for the cyber security design and process, the requirement from the certification authority i.e FAA, TCCA and EASA and the evolution of IT especially the AI

Cloud security, networking virtualization, higher computing capacity to burst-force the security, security analysis automation

using AI for cybersecurity defense, protecting OT infrastructure

current key trends in cybersecurity: incident response and threat hunting, cybersecurity skills gap, and AI in security.

anticipated changes in the cybersecurity landscape: increasing regulation, remote work and hybrid environment. impact on skills and knowledge required: adapt to emerging technologies, focus on compliance, privacy expertise.

Cloud security and data privacy.

Yes, IoT hacking, AI powered attacks and cybersecurity regulations

The ever increasing amount of cyber attacks or intrusions will require the use of AI to analyse the impact and address them. Human Autonomy Teaming and AI Trustworthiness will need to be addressed. In 5-10 years, Quantum technology will become a game changer for encryption and communication. Cybersecurity professionals will need to know how to work within a quantum computing framework.

Ai should be at the center of the training, given its potency in creating hooks for simple employees to initiate breaches.

Rigorous processes embedded within language and language toolset ecosystems.

NA

White collar crime frightens the entire industry specifically as software moves rapidly to the cloud.

The industry will be more dependent on communication networks, cloud resources, and remote support which all present challenges for cybersecurity.

AI application in cyber attacking is increasing this also change the landscape of Cybersecurity. AI knowledge is a must for the professionals in this field.

With the increase adoption of automation through machine learning and artificial intelligent techniques, the cybersecurity landscape is likely to evolve towards threats related to machine learning models and their accurate behavior especially that these models are highly dependent on the data they are trained on and which can be tampered. Further, data privacy and anonymization techniques will become more important especially with the new services foreseen for 6G.

Cloud data security on private and shared data lakes. Private data protection in AI tools context.

Cloud and data management

Cyber attacks will rise due to the use of Augmented Reality, Virtual Reality, Internet of things and widespread use of technology

AI application in cybersecurity is one of the main key trends. I anticipate the cybersecurity will become more and more essential not only to companies but also to individuals, especially in this post-pandemic era. For example, remote working will become a big security challenge for all companies, and online identity verification requires high security of digital information of individuals. This impact requires the professionals not only have general cybersecurity knowledge, but also be familiar with some specific security fields.

Cybersecurity risk related to ICS/OT will increase significantly in the next 5-10 years. ICS are the critical assets of industries; without them no production will happen and the economical/financial impact will be catastrophic.

Wider Attack surface due to widespread use of cloud based services and highly connected supply chains. Digital supply chain risk mitigation. Also identify systems are increasingly a target for attackers.

Q27 - Please share any additional comments, suggestions, or concerns you may have regarding the development of our Cybersecurity program.

14 Responses

Please share any additional comments, suggestions, or concerns you may have regarding the development of our Cybersecurity program.

Diversity of graduates (culture, gender), duration of the programs (condensed programs, certificates)

This program will need to be constantly adapted due to the rapid changing of the cybersecurity domain and on the other side the critical needs of the industry (specially SMEs) for cybersecurity.

Courses based on the study of use cases stemming from the reality of critical infrastructure operations and services might be very useful for the training of future cybersecurity analysts.

Try to offer some hands-on training. For example, divide the students into 2 groups working on opposite sides of a system. One side tries to crack it, while the other side tries to protect it.

The course should include both theoretical concepts and hands-on practical applications in 50/50.

There are different fields within cybersecurity, each has a specific focus of skills (pentesting, network sec, application sec, DevSecOps that requires stronger coding skills). It would be valuable to introduce those topics to students as soon as they understand the basic concepts in order to allow them opportunities and time to dive into fields of their choice.

I commend this initiative, as this is front and center in the concerns of a big organization nowadays, since we all collect one form or another of data from our partners.

As a cybersecurity program, you must focus on equipping the students with comprehensive, in-depth knowledge and skills that align with the current and evolving demands of the field. To achieve this, the curriculum should encompass things like:

Certification Standards Analysis: Teach students to understand, compare, and critically assess various certification standards. This knowledge will enable them to discern the most appropriate standards for different projects and recognize the strengths and weaknesses of each.

Architectural Understanding: Educate students on identifying and designing well-structured systems. These systems should embody simplicity, ease of maintenance, embedded processes, and clarity, supported by solid conceptual and semantic frameworks. This understanding is crucial for creating systems that are not only efficient but also resilient to cyber threats.

Testing Methodologies: Provide in-depth training in various testing methodologies, including unit testing, coverage testing, fuzz testing, and formal verification. Students should learn the nuances of each method to applying them effectively in different scenarios, thereby enhancing the security and reliability of the systems they work on.

System Critique and Analysis: Encourage critical analysis of complex systems like the Linux kernel. Students should understand why smaller, more controlled operating systems or even bare metal runtimes, such as Ada certifiable bare-metal profiles, are often preferred in highly mission-critical projects due to their reduced attack surfaces.

Vulnerabilities of Virtual Machines, Interpreters, and dynamic typing: Teach the inherent risks associated with virtual machines, interpreters, and dynamic approaches. Students should be able to identify and mitigate the vulnerabilities that these components introduce into systems.

Capability-Based System Design: Introduce students to the concept and design of capability-based systems. Understanding these systems will provide them with a broader perspective on secure system architecture and its implementation.

Focus on Hard Skills: Shift the educational focus from agile, flexible methodologies and hacking culture to hard, technical skills. Cybersecurity is a field grounded in expertise and knowledge, and your program should reflect this by prioritizing concrete skills over procedural knowledge.

NA

Put less focus on certifications and more focus on hands-on exercises that allow students to gain experience solving real-world challenges with technology.

It is a great news that the University takes the proactive approach to develop this program and the key is to address major issues instead of a broader and superficial program. Employers want to have a graduate who can solve problems with the knowledge and skills they obtained in school.

NA

Cybersecurity is a very good and important field for a college to expand its academic programs. The demand for well-trained cybersecurity professionals is increasing rapidly.

I already shared my all my concerns in this survey.

Q27 - Please share any additional comments, suggestions, or concerns you may have regarding the development of our Cybersecurity program.

14 Responses



Undergraduate Student Interest Survey Findings

To assess interest in the proposed program, we also surveyed 2,500 engineering undergraduates in Gina Cody School of Engineering at Concordia University, of which 536 responded (a 21% response rate). These students are from two degree programs, Bachelor of Computer Science (162, 30%) and Bachelor of Engineering (374, 70%). The survey probed students' likelihood to enroll, the program's alignment with their academic and professional goals, and their interest in related offerings such as a BSc or minor. It also invited open-ended feedback. The main findings are summarized as follows. Note that due to the scope of the proposal, only results from the most relevant questions are presented here.

Key findings from quantitative data

Initial Interest in the Program (Q3): Out of 534 respondents, a majority expressed positive interest in applying to the BEng in Cybersecurity Engineering program if it became available, with 36% indicating they are 'Very likely' to apply and 22% as 'Likely'. A smaller group, 17%, said they were 'Somewhat likely' to apply, while 22% felt 'Unlikely' to apply. Only 5% were unsure ('Don't know').

Preference Over Current Program (Q5): When considering whether they would have preferred the BEng in Cybersecurity Engineering over their current program, 29% of 533 respondents said 'Very likely', while 25% stated 'Likely'. Additionally, 24% were 'Somewhat likely' to prefer the cybersecurity program, and 20% 'Unlikely'. A minimal 2% did not know.

Relevance to Academic and Professional Goals (Q6): The proposed program objectives seem to align well with students' goals, with 37% finding them 'Very relevant' and a significant 47% finding them 'Relevant'. Only a small fraction of 11% found the objectives 'Not relevant', and 4% were undecided ('Don't know'), out of 532 respondents.

Course Relevance (Q9): Regarding course relevance, a strong majority of the 516 respondents believe the proposed courses are pertinent, with 44% rating them as 'Very relevant' and another 44% as 'Relevant'. Fewer students, 9%, thought the courses were 'Not relevant', and 2% were uncertain ('Don't know').

Program Improvement Suggestions (Q11): Students provided feedback on potential improvements for 499 respondents, with a considerable demand for a 'Co-op option', desired by 67%. 'More hands-on training' was recommended by 53%, while 'Program options or specialization certificates' were sought by 32%. A mandatory co-op was less popular but still notable at 20%, and 5% had other unspecified suggestions.

Interest in BSc (Q12) and Minor (Q14) in Cybersecurity: Students also expressed interest in alternative cybersecurity education paths, including a three-year BSc program and a minor in the field, suggesting a general student interest in cybersecurity education at various levels and commitments.

To conclude, the survey reveals a strong interest in the proposed BEng in Cybersecurity. Considering a response rate of 21% from an unspecified total population, these insights should be weighted accordingly. While the data is indicative of the opinions of those who responded, it may not represent the entire student body's perspective. Nonetheless, the feedback is crucial for the university to consider while finalizing the program details.

Key findings from final comments/questions (Q-15)

Of the 536 respondents, 114 (21%) provided additional comments or questions. Eight common themes were identified across all comments, summarized below with two representative quotes cited for each theme.

1. Interest and Enthusiasm

Many students express a high level of interest in the proposed Cybersecurity program, wishing it had been available sooner. There is excitement about the possibility of specializing in Cybersecurity at the undergraduate level.

- "I would absolutely love to have this program and would definitely start getting my credits for this course."
- "Very cool idea to have this implemented. The future will depend on people who protect people from hackers."

2. Program Structure and Content

Respondents are curious about the structure of the program, the differences between the BEng and BSc options, and the content of the courses. There's a desire for clarity on how the new program aligns with current offerings in related fields.

- "How does the BSc in Cybersecurity differentiate from BEng in Cybersecurity Engineering?"
- "A minor in cyber security would be really good, but will we be able to finish the computer science bachelor program I am currently enrolled in on time if this will be offered next year?"

3. Program Accessibility and Transition

Concerns about the ability to transfer into the Cybersecurity program from other majors are common, with students seeking information about credit transfers and GPA requirements. Flexibility for current students is a priority.

- "Would SOEN students be able to take electives from the Cybersecurity program?"
- "I would hope that there's an option for current computer science or engineering students to transfer into this program during their study if it becomes available."

4. Practical Experience and Employment

Students underscore the importance of including practical experience, such as co-op opportunities, to enhance employability. They also express the need for the curriculum to stay updated with industry standards.

- "A BEng in Cybersecurity is something I would be interested in assuming the job market has enough demand such that 'mandatory coop' is something that can be fulfilled."
- "I love Cybersecurity but without a good background of work experience, no one will offer me a job."

5. Alternatives to a Full Degree

The idea of a minor or certificate in Cybersecurity is well-received, suggesting that students are interested in integrating Cybersecurity education into their current majors without committing to a full degree.

- "A certificate in Cybersecurity is more feasible, and in combination with two additional certificates (to make up a 90-credit degree program) would be highly competitive."
- "Instead of a new program for Cybersecurity, Add cybersecurity courses to Software Engineering and Computer Science electives as a new 'group'."

6. Career Prospects

The relevance of the program to job opportunities and the demand in the job market is a recurring theme, with students weighing the program's potential to enhance their career prospects.

- "Cybersecurity Engineering could really interest students in SCS Concordia and Hack Concordia. Great initiative!"
- "It's a nice idea, but a bit too specialized, would need coop to be considered over comp sci."

7. Teaching Quality

A few comments touch on the importance of having skilled and experienced teachers, suggesting that the success of the program hinges not just on its existence but also on the quality of its delivery.

- "The program itself is good. However, having experienced and skilled teacher plays an important role for the success of every engineering program."
- "It would reflect poorly on Concordia if the curriculum isn't frequently updated and students are not aware of current security standards."

8. Alternative Program Suggestions

A minority of students suggest considering other fields or recommending improvements to current programs before introducing new ones.

- "Add chemical engineering or bioengineering instead!"
- "Focus on improving your engineering program first, before creating a new one. There is a serious academic short-falling at Concordia."

These verbal comments further validated the strong interest in the proposed BEng program or in cybersecurity in general.



Default Question Block

Cybersecurity Engineering Program Survey

Concordia University's Gina Cody School of Engineering and Computer Science would like to get your feedback on a proposed **BEng in Cybersecurity Engineering** program. We are hoping to assess the level of interest in this program among current Concordia students and we invite you to complete a short **5-minute survey**.

Your responses will be held in strict confidence and will only be used to produce aggregate results. The survey will close on November 27.

Your participation will go a long way in informing the development of the program. We greatly appreciate your feedback.

Program Description

The Gina Cody School of Engineering and Computer Science would like to offer a 120-credit **BEng in Cybersecurity Engineering** program. This multidisciplinary initiative is led by the Concordia Institute for Information Systems Engineering (CIISE). The curriculum of the program consists of both fundamental computer science principles and more specialized courses covering all aspects of cybersecurity, including cryptography, operating system security, network security, software security, secure programming, Internet of Things security, blockchain technology, cybersecurity ethics, cybercrime investigations, and privacy.

Program Objectives

The main objective of the program is to prepare students for a rewarding career in the

fast-growing field of Cybersecurity. The program will offer students a comprehensive body of knowledge including cryptography, foundations for secure information systems, access control, security policies and security mechanisms, operating system security, network security, security vulnerabilities and malware defense, secure programming, blockchain technology, cybersecurity ethics, privacy, etc.

The program will also help students develop various cybersecurity skills, including penetration testing skills, risk assessment and security management skills, security engineering skills, security monitoring skills, incident handling and forensic analysis skills, secure network management skills, regulatory compliance, and auditing skills, etc.

Based on this description, how likely is it that you would apply to the BEng in Cybersecurity Engineering program if it became available?

- Very likely
- Likely
- Somewhat likely
- Unlikely
- Don't know

In what year would you most likely expect to apply to the BEng in Cybersecurity Engineering program?

- 2025
- 2026
- Later than 2026
- Don't know
- Would not apply

If the BEng in Cybersecurity Engineering program had been available at the time you applied to Concordia, how likely is it you would have preferred this program to your current one?

- Very likely
- Likely
- Somewhat likely
- Unlikely
- Don't know

How relevant are the proposed program objectives to your academic and professional goals?

- Very relevant
- Relevant
- Not relevant
- Don't know

If you responded "Not relevant" or "Don't know", please explain your choice.

Program Requirements

The proposed BEng in Cybersecurity Engineering is a full-time 120-credit (four-year) program. The curriculum consists of the cybersecurity engineering core courses, engineering courses, technical electives, and general education elective courses.

Cybersecurity Engineering Core Courses

- COMP 232 Mathematics for Computer Science
- COMP 248 Object-Oriented Programming I
- INSE 201 Security Ethics, Laws, Standards & Compliance

- INSE 231 Cryptography I
- COMP 249 Object-Oriented Programming II
- COMP/SOEN 228 System Hardware
- INSE 287 Security Protocols
- COMP 348 Principles of Programming Languages
- COMP 352 Data Structures and Algorithms
- INSE 341 Secure Software Design/Secure programming
- COMP/COEN 346 Operating Systems
- ELEC 275 Principles of Electrical Engineering
- INSE 331 Cryptography II
- COMP 335 Introduction to Theoretical Computer Science
- INSE 342 Operating System Security
- INSE 343 Reverse Engineering, Application and Malware Analysis
- INSE 384 Mobile application privacy and security
- INSE 363 Critical Infrastructure and IoT Security
- INSE 345 Penetration Testing and Ethical Hacking
- INSE 357 Usability and human aspects of security
- INSE 390 Security Engineering Team Design Project
- INSE 321 Cybercrime & Digital Forensics
- INSE 490 Capstone Security Engineering Design Project
- INSE 493 Advanced Topics in Cybersecurity

Engineering Courses

- ENGR 202: Sustainable Development & Environmental Stewardship (1.5 credits)
- ENGR 213: Applied Ordinary Differential Equations (3 credits)
- ENGR 233: Applied Advanced Calculus (3 credits)
- ENGR 301: Engineering Management Principles & Economics (3 credits)
- ENGR 371: Probability and Statistics in Engineering (3 credits)
- ENGR 391: Numerical Methods in Engineering (3 credits)

Technical Electives

- Blockchain Technologies & Applications
- Industrial Control System & Critical Infrastructure Security
- IoT and Embedded System Security
- Quantum Computing & Security
- Security Auditing and Compliance
- Cybersecurity of Healthcare Systems and Devices
- Cybersecurity Management & Governance

Are the proposed courses relevant to your academic and professional goals?

- Very relevant
- Relevant
- Not relevant
- Don't know

If you responded "Not relevant" or "Don't know", please explain your choice.

In what ways do you think this program can be improved? (Please select all that apply.)

- Co-op option available
- More hands-on training
- Program options or specialization certificates available
- Mandatory co-op included in the program
- Other (please specify):

If we also offer a 90-credit (three-year) **BSc in Cybersecurity** program that does not require engineering core courses, how likely is it you would apply to the BSc in Cybersecurity program?

- Very likely
- Likely
- Somewhat likely
- Unlikely
- Don't know

In what year would you most likely expect to apply to the BSc in Cybersecurity?

- 2025
- 2026
- Later than 2026
- Don't know
- Would not apply

If we also offer a 25-credit **Minor in Cybersecurity** program that covers cybersecurity fundamentals, how likely is it you would apply to the Minor in Cybersecurity program?

- Very likely
- Likely
- Somewhat likely
- Unlikely
- Don't know

Final Comments

If you have any final comments or questions regarding the proposed BEng in Cybersecurity Engineering program, please share them below.



Powered by Qualtrics

UNDERGRADUATE PROGRAM IN CYBERSECURITY



Attention,
future
guardians
of the
digital
world!

Are you ready to embark on an exciting journey into the realm of cybersecurity, where you'll **unlock the secrets of protecting the digital universe?** Imagine having the power to **defend against cyber threats**, and dive into the exciting world of ethical hacking, security architecture, and risk management. Now, let's take the first step on this thrilling path together.

The Gina Cody School of Engineering and Computer Science at Concordia University is thrilled to introduce our upcoming undergraduate program in cybersecurity engineering. Our mission is to empower you with the most cutting-edge skills, enabling you to **master the art of protecting critical systems, data**, and infrastructure. With experienced faculty members and experts as your guides, you'll explore the intricate domains of **threat analysis, vulnerability assessment, cryptography**, and **network security**. You'll dive deep into penetration testing, incident response, and secure coding practices. Through hands-on labs and access to the latest tools, you'll be well-prepared to confront the ever-evolving cybersecurity challenges.

Now, we need your valuable input to ensure that our program aligns with your interests and aspirations. Your thoughts matter, and they will shape the future of cybersecurity education.

Please take a moment to complete our survey and share your insights with us. Together, we can forge a path where cybersecurity thrives and where your role as a cybersecurity engineer becomes indispensable. Join us on this exhilarating journey today!

UNDERGRADUATE PROGRAM IN CYBERSECURITY

Current/ Previous Education

- French CEGEP Quebec
- English CEGEP
- Highschool (Canada)
- Highschool (Overseas)
- Other (please specify): _____

Are you currently exploring multiple program options before making your final decision?

Yes No

Have you researched undergraduate programs related to Cybersecurity?

Yes No

On a scale from 1 to 5, how would you rate your current level of interest in cybersecurity? (1 = Not Interested, 5 = Extremely Interested)

(1) (2) (3) (4) (5)

What factors influenced your decision to consider the cybersecurity program or related programs at our university? (Select all that apply)

- Reputation of the program
- Availability of co-op program
- Location of the university
- Course offerings
- Faculty expertise
- Scholarships or financial aid
- Career opportunities in the field
- Other (please specify): _____

Name and email (Optional):

Do you agree that we email you further information about our Cybersecurity program?

Yes No

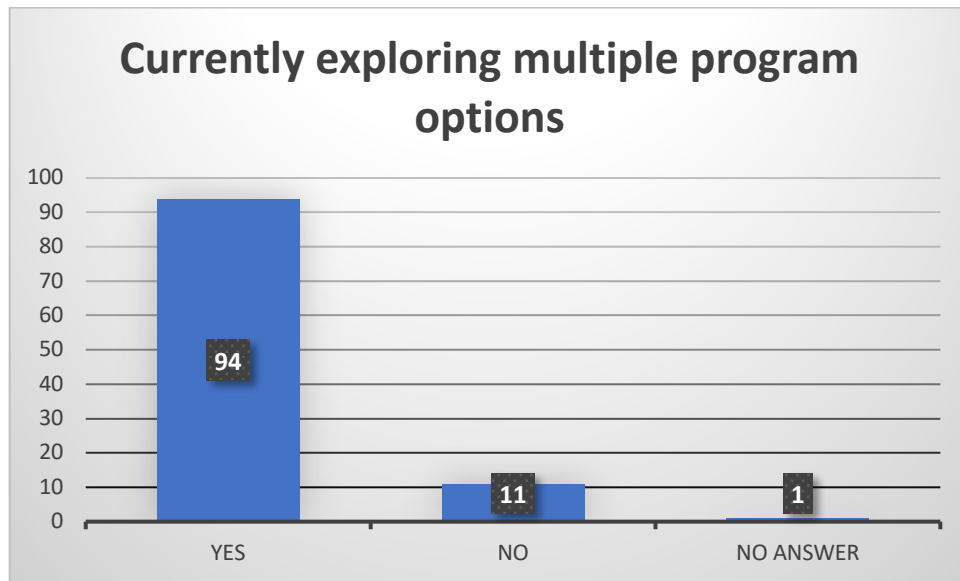
Do you have any additional comments or suggestions related to the cybersecurity program or other programs you are exploring?

106 persons filled the survey.

78/106 (73 %) provided their emails and required more information about the program once it is available.

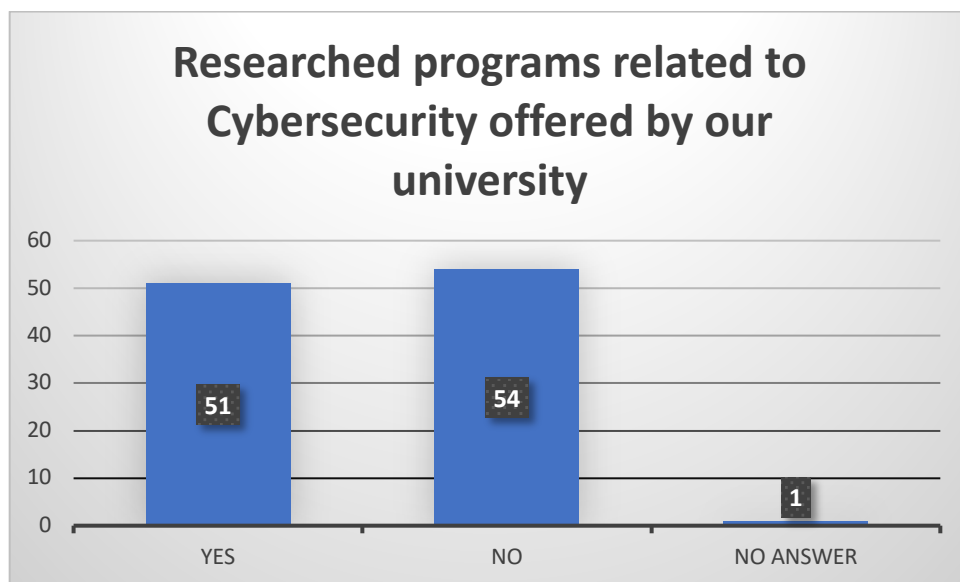
Are you currently exploring multiple program options before making your final decision?

89% are currently exploring different options for their university studies.



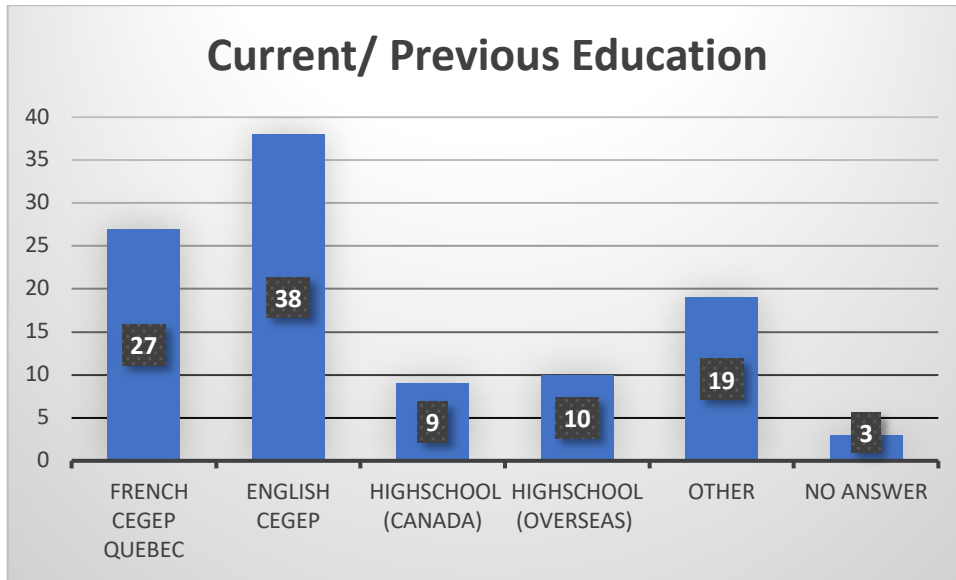
Have you researched programs related to Cybersecurity offered by our university before applying?

Almost 50% looked if the program was offered by Concordia.



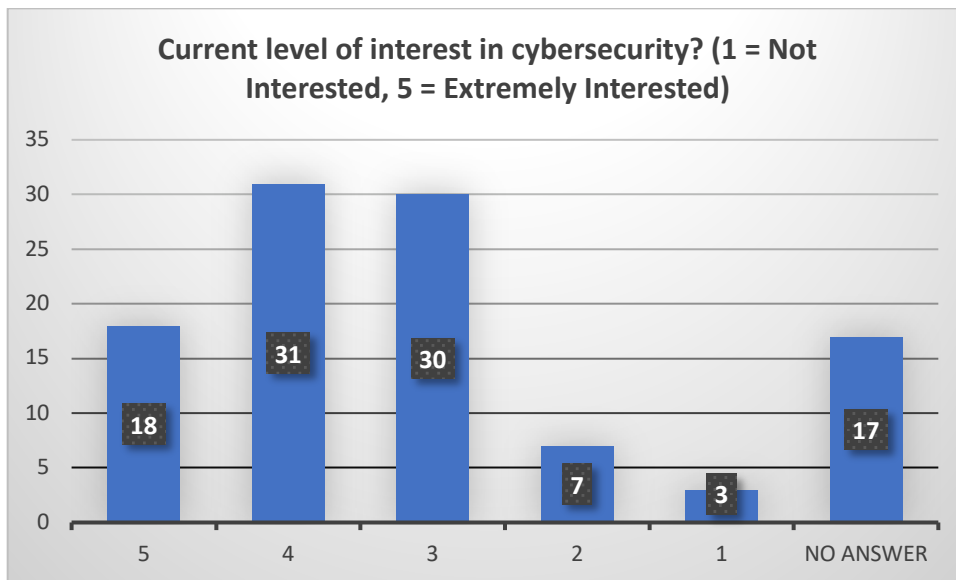
Current/ Previous Education:

65% of the population was mostly CEGEP students (French & English).



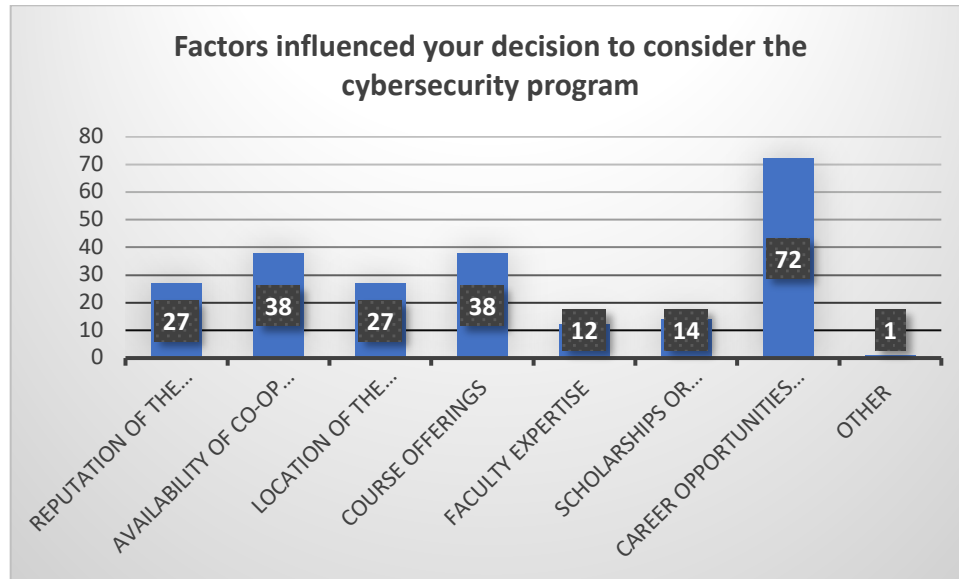
on a scale from 1 to 5, how would you rate your current level of interest in cybersecurity? (1 = Not Interested, 5 = Extremely Interested)

79/106 (74%) showed interest in the program with levels varying between (extreme interest to moderate interest)



What factors influenced your decision to consider the cybersecurity program or related programs at our university? (Select all that apply)

The highest is Career opportunities, availability of a co-op program, and course offerings.

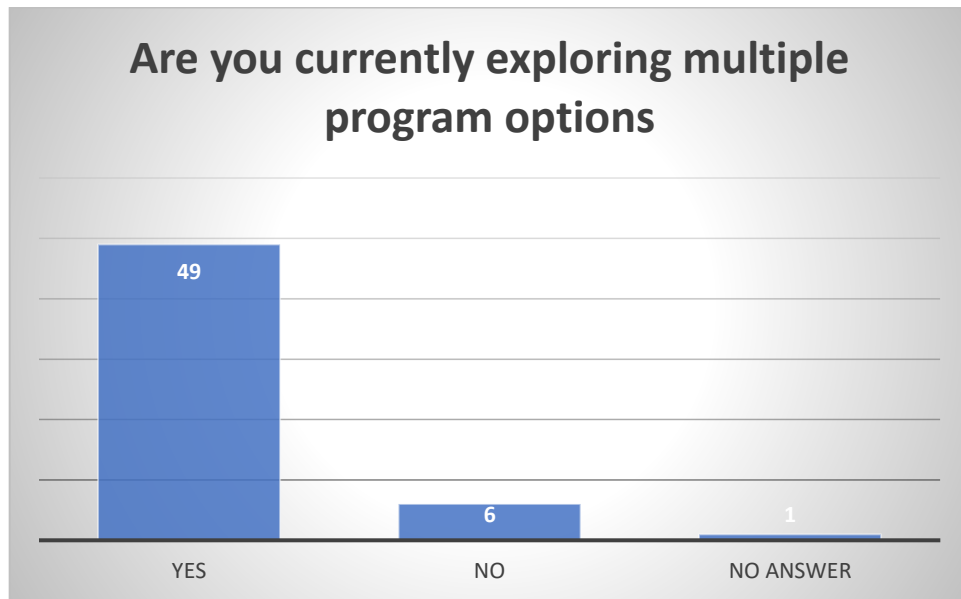


56 persons filled the survey.

43/56 (77 %) provided their emails and required more information about the program once it is available.

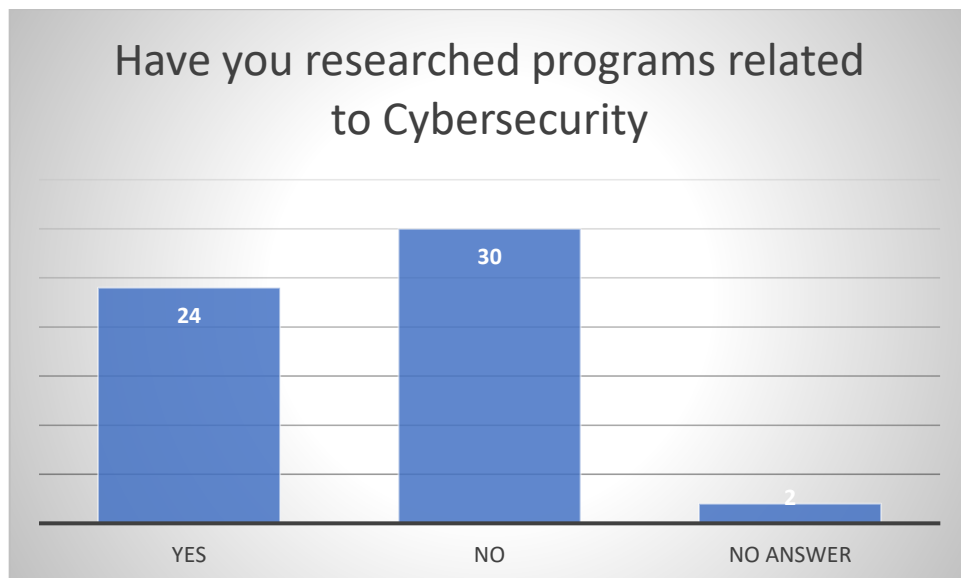
Are you currently exploring multiple program options before making your final decision?

87% are currently exploring different options for their university studies.



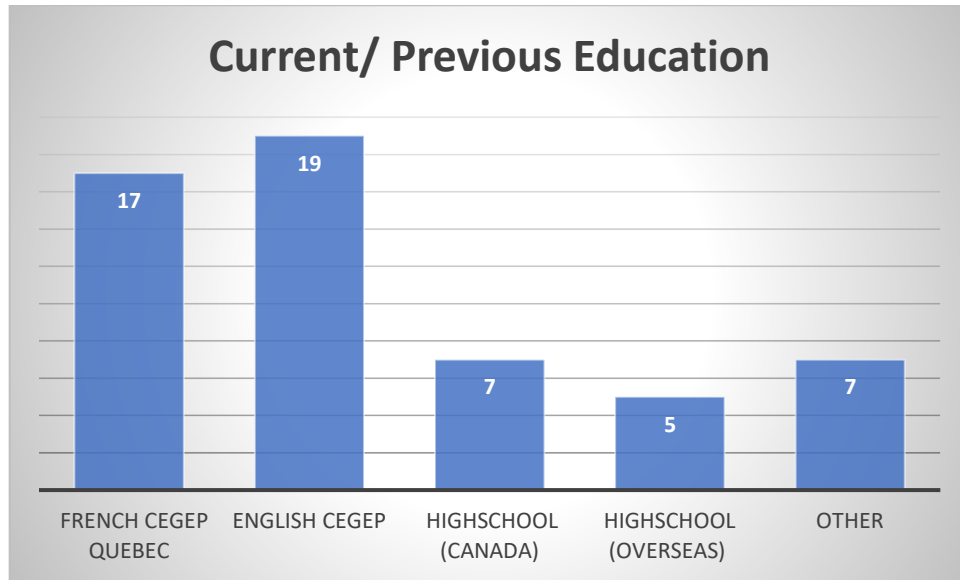
Have you researched programs related to Cybersecurity offered by our university before applying?

Almost 43% looked if the program was offered by Concordia.



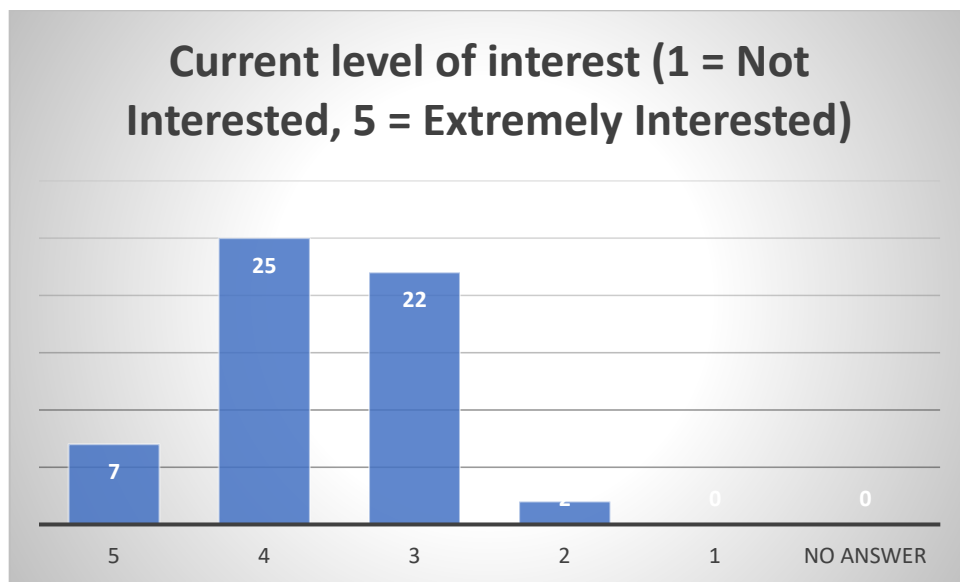
Current/ Previous Education:

64% of the population was mostly CEGEP students (French & English).



on a scale from 1 to 5, how would you rate your current level of interest in cybersecurity? (1 = Not Interested, 5 = Extremely Interested)

54/56 (96%) showed interest in the program with levels varying between (extreme interest to moderate interest)



What factors influenced your decision to consider the cybersecurity program or related programs at our university? (Select all that apply)

The highest is Career opportunities, availability of a co-op program, and reputation of the program.



Job Posting Analytics

Lightcast Q3 2023 Data Set

February 2024

Parameters

Select Timeframe: Feb 2019 - Jan 2024

Occupations:

Results should include

Code	Description
21220	Cybersecurity specialists

Regions:

Code	Description
01	Canada

Minimum Experience Required: Any

Education Level:

Description
Bachelor's degree

Job Type: Exclude Internships

Part-Time / Full-Time :

Full-time (> 32 hours)

Keyword Search:

Posting Type: Newly Posted

Job Postings Overview

9,913

Unique Postings
20,294 Total Postings

2,245

Employers Competing
252,024 Total Employers

2 : 1

Posting Intensity



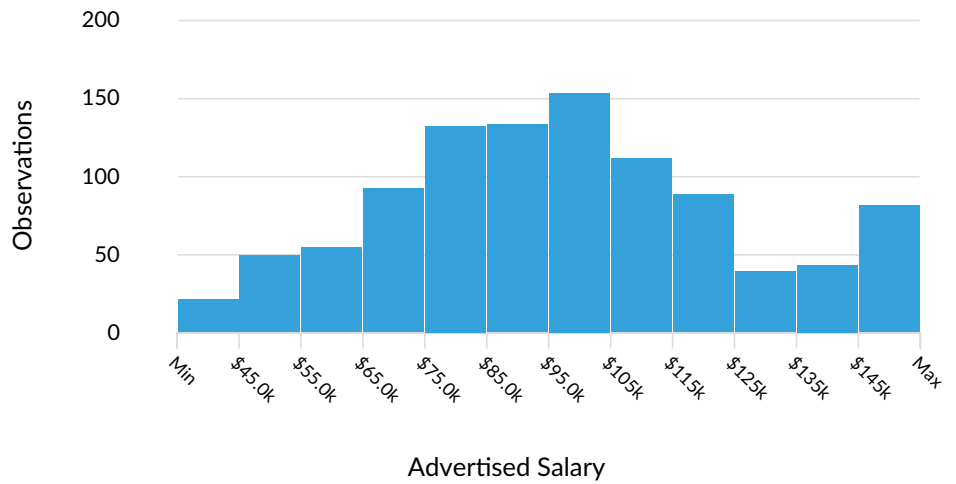
Advertised Salary

There are 996 advertised salary observations (10% of the 9,913 matching postings).

\$95.0K

Median Advertised Salary

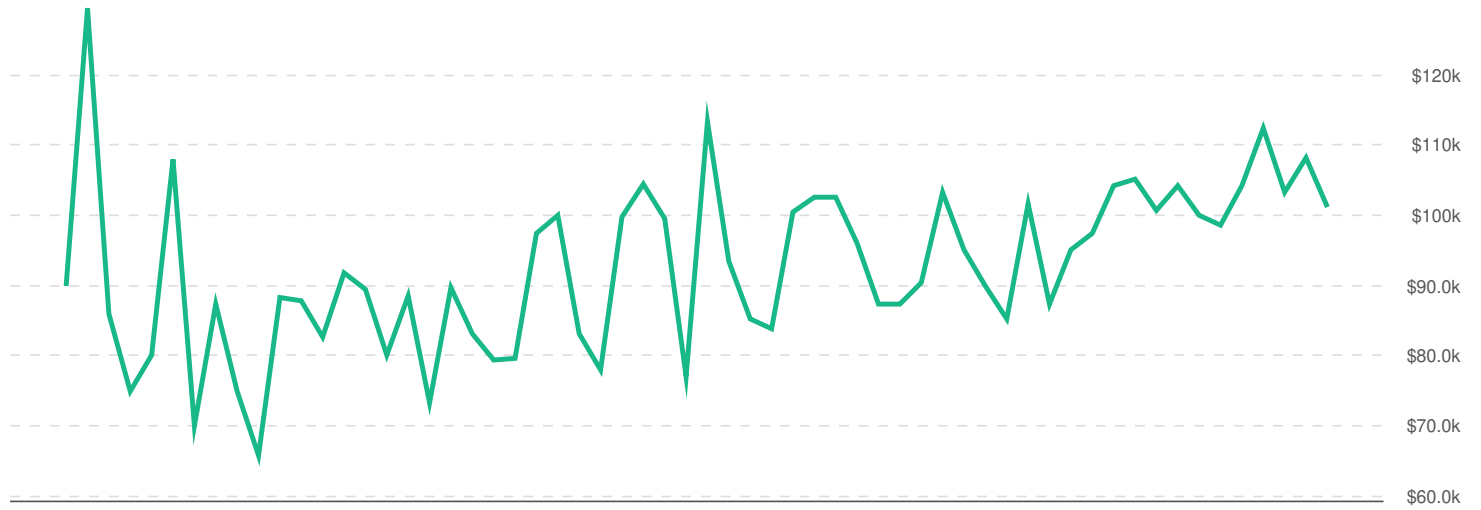
This is \$5.4K above the government recorded median salary for Cybersecurity specialists in Canada.



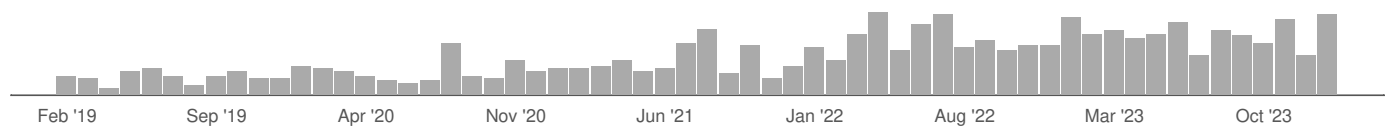
Advertised Wage Trend

▲ 12.5% Feb 2019 - Jan 2024

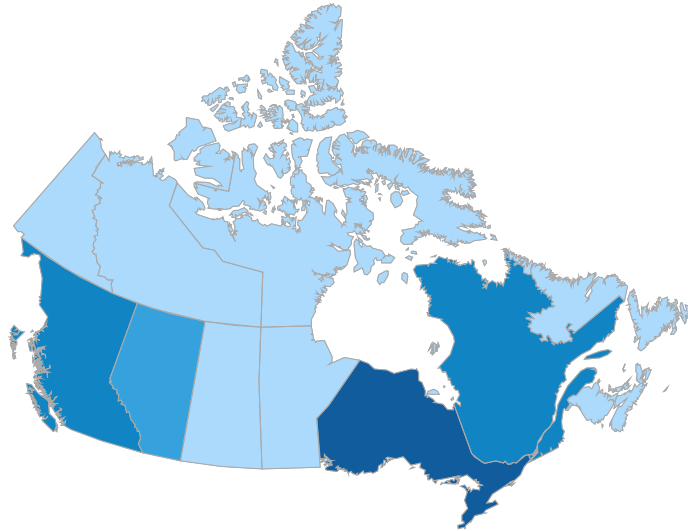
\$95.0k Median



996 Job Postings

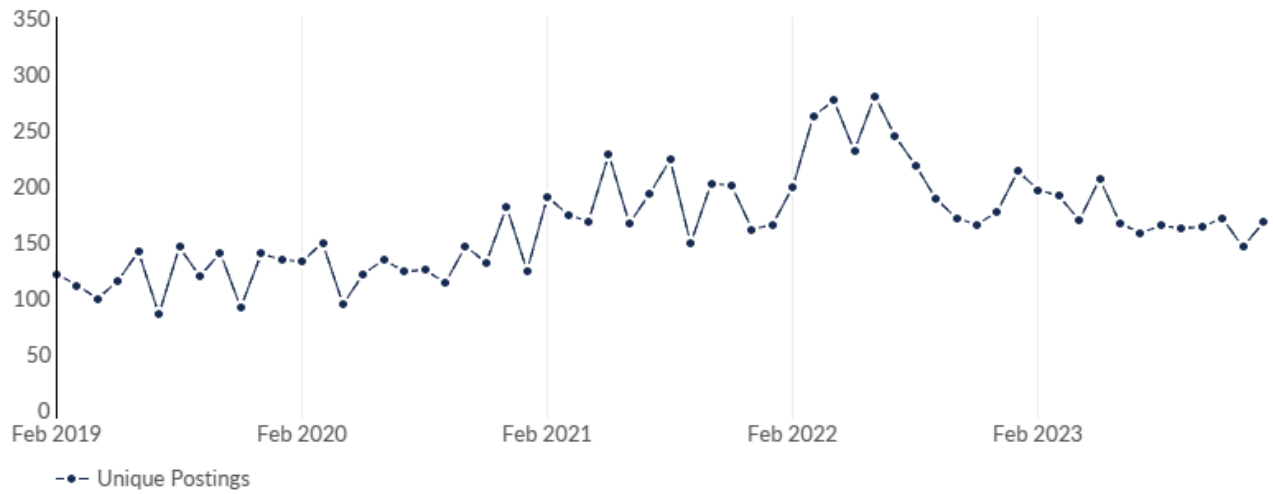


Job Postings Regional Breakdown



Province	Unique Postings (Feb 2019 - Jan 2024)
Ontario	5,854
Quebec	1,268
British Columbia	1,091
Alberta	811
Nova Scotia	243

Unique Postings Trend



Month	Unique Postings	Posting Intensity
Jan 2024	167	2 : 1
Dec 2023	145	2 : 1
Nov 2023	171	2 : 1
Oct 2023	163	2 : 1
Sep 2023	162	2 : 1
Aug 2023	164	2 : 1
Jul 2023	158	2 : 1
Jun 2023	166	2 : 1
May 2023	206	2 : 1
Apr 2023	169	2 : 1
Mar 2023	191	2 : 1
Feb 2023	196	4 : 1

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	0	0%
High school or GED	33	0%
Associate's degree	1,002	10%
Bachelor's degree	9,913	100%
Master's degree	1,368	14%
Ph.D. or professional degree	61	1%





















Minimum Education Breakdown

Minimum Education Level	Unique Postings (minimum)	Unique Postings (max advertised)	% of Total (minimum)
High school or GED	33	0	0%
Associate's degree	992	0	10%
Bachelor's degree	8,888	957	90%
Master's degree	0	1,339	0%
Ph.D. or professional degree	0	61	0%





















Experience Breakdown

Minimum Experience	Unique Postings	% of Total
No Experience Listed	1,916	19%
0 - 1 Years	306	3%
2 - 3 Years	2,152	22%
4 - 6 Years	3,437	35%
7 - 9 Years	1,200	12%
10+ Years	902	9%



Top Companies Posting

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
TD Bank	1,004 / 425	2 : 1 	
Procom	692 / 264	3 : 1 	
Bell	426 / 227	2 : 1 	
TELUS	403 / 221	2 : 1 	
Deloitte	518 / 201	3 : 1 	
Ernst & Young	373 / 177	2 : 1 	
Scotiabank & Trust	394 / 151	3 : 1 	
Tundra Technical Solutions	148 / 134	1 : 1 	
BMO Harris Bank	218 / 124	2 : 1 	
Manulife	156 / 100	2 : 1 	



Top Cities Posting

City	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Toronto, Toronto County	7,293 / 3,530	2 : 1 	
Montreal, Montreal County	1,555 / 982	2 : 1 	
Ottawa, Ottawa County	1,171 / 603	2 : 1 	
Calgary, Division No. 6 County	1,130 / 598	2 : 1 	
Vancouver, Greater Vancouver County	1,028 / 571	2 : 1 	
Mississauga, Peel County	820 / 471	2 : 1 	
Halifax, Halifax County	529 / 203	3 : 1 	
Waterloo, Waterloo County	317 / 192	2 : 1 	
Winnipeg, Division No. 11 County	488 / 188	3 : 1 	
Edmonton, Division No. 11 County	320 / 175	2 : 1 	





















Top Posted Occupations

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Cybersecurity specialists	20,294 / 9,913	2 : 1 	

Top Posted Occupations

Occupation	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Cyber / Information Security Engineer / Analyst	20,294 / 9,913	2 : 1 	

Top Posted Job Titles

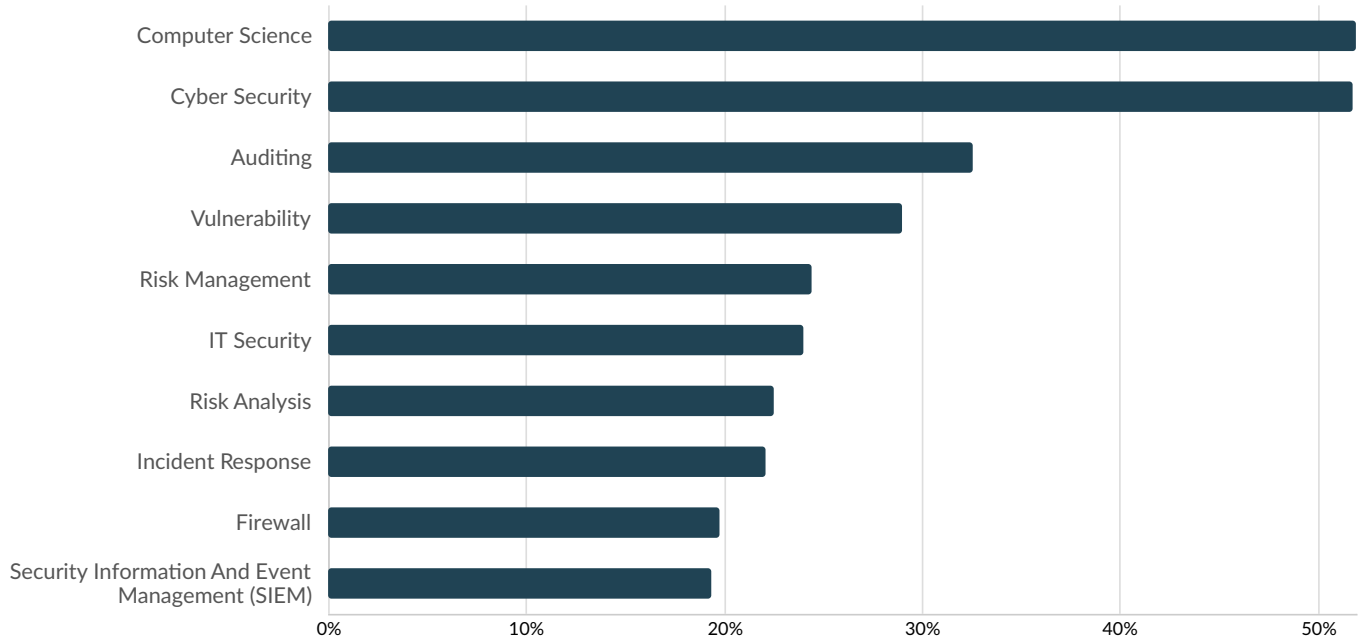
	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Information Security Analysts	1,273 / 535	2 : 1 	
Cybersecurity Analysts	995 / 484	2 : 1 	
Cybersecurity Specialists	879 / 402	2 : 1 	
Cybersecurity Managers	572 / 299	2 : 1 	
Information Security Specialists	724 / 272	3 : 1 	
Information Security Managers	441 / 239	2 : 1 	
Cybersecurity Consultants	342 / 198	2 : 1 	
IT Security Analysts	292 / 185	2 : 1 	
Security Analysts	277 / 171	2 : 1 	
Technology Risk Managers	301 / 154	2 : 1 	

Top Industries

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Commercial Banking	2,189 / 969	2 : 1	
Employment Placement Agencies	1,253 / 544	2 : 1	
Administrative Management and General Management Consulting Services	1,053 / 374	3 : 1	
Offices of Certified Public Accountants	718 / 315	2 : 1	
Software Publishers	505 / 313	2 : 1	
Direct Life Insurance Carriers	558 / 242	2 : 1	
Wired Telecommunications Carriers	448 / 241	2 : 1	
Temporary Help Services	300 / 238	1 : 1	
Telephone Answering Services	403 / 221	2 : 1	
Engineering Services	372 / 210	2 : 1	

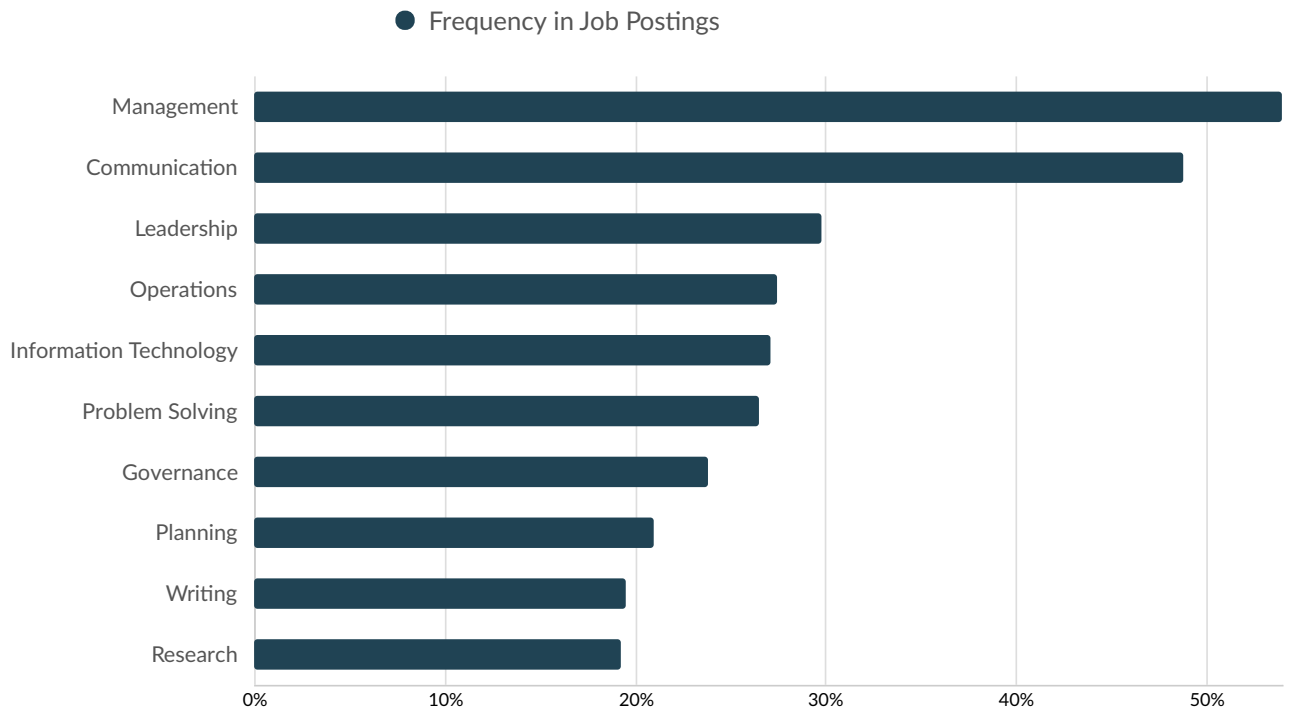
Top Specialized Skills

● Frequency in Job Postings



	Postings	% of Total Postings
Computer Science	5,148	52%
Cyber Security	5,133	52%
Auditing	3,226	33%
Vulnerability	2,871	29%
Risk Management	2,424	24%
IT Security	2,379	24%
Risk Analysis	2,229	22%
Incident Response	2,195	22%
Firewall	1,964	20%
Security Information And Event Management (SIEM)	1,922	19%

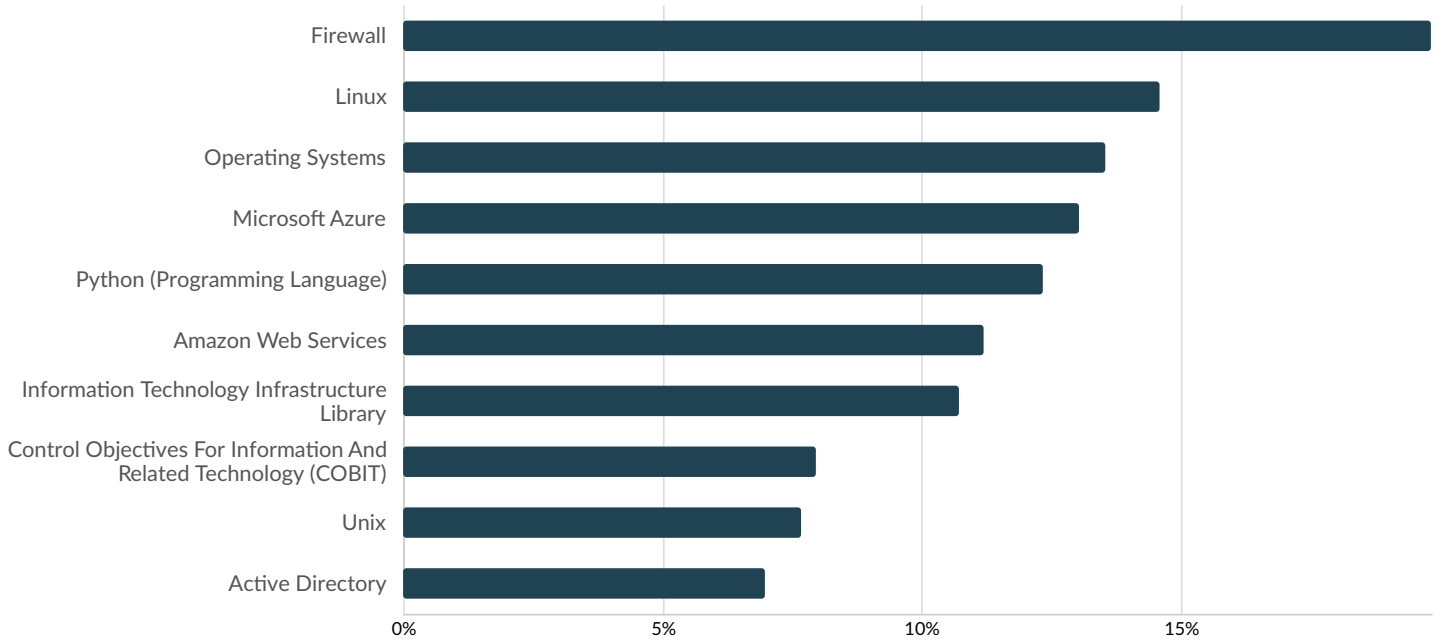
Top Common Skills



	Postings	% of Total Postings
Management	5,349	54%
Communication	4,838	49%
Leadership	2,955	30%
Operations	2,722	27%
Information Technology	2,691	27%
Problem Solving	2,629	27%
Governance	2,360	24%
Planning	2,078	21%
Writing	1,936	20%
Research	1,912	19%

Top Software Skills

● Frequency in Job Postings



	Postings	% of Total Postings
Firewall	1,964	20%
Linux	1,444	15%
Operating Systems	1,342	14%
Microsoft Azure	1,291	13%
Python (Programming Language)	1,222	12%
Amazon Web Services	1,109	11%
Information Technology Infrastructure Library	1,061	11%
Control Objectives For Information And Related Technology (COBIT)	789	8%
Unix	759	8%
Active Directory	692	7%

Top Qualifications

	Postings with Qualification
Certified Information Systems Security Professional	4,432
Certified Information Security Manager	2,261
Certified Information System Auditor (CISA)	2,018
GIAC Certifications	1,608
Certified In Risk And Information Systems Control	901
Certified Ethical Hacker	884
Offensive Security Certified Professional	692
NIST Cybersecurity Framework (CSF)	656
Certified Cloud Security Professional (CCSP)	650
CompTIA Security+	517

Appendix A

Top Posting Sources

Website	Postings on Website (Feb 2019 - Jan 2024)
indeed.com	2,103
careerjet.ca	902
workopolis.com	855
myworkdayjobs.com	850
jobs.ca	752
taleo.net	431
careerbuilder.ca	335
option-carriere.ca	320
icims.com	298
theitjob.com	292
td.com	266
glassdoor.ca	248
brassring.com	237
careerbeacon.com	172
energyjobline.com	171
bce.ca	170
localwork.ca	159
scotiabank.com	140
telus.com	132
talentnet.community	122
jobillico.com	120
deloitte.ca	108
ultipro.ca	105
simplyhired.ca	102
jobvite.com	96

Appendix B

Sample Postings

Sr. Specialist (W/m/x) Cybersecurity

Link to Live Job Posting: www.jobs.ca

Location: Aurora, York County

Company: Magna Powertrain

Job Title: Cybersecurity Specialists

About us We see a future where everyone can live and move without limitations. That's why we are developing technologies, systems and concepts that make vehicles safer and cleaner, while serving our communities, the planet and, above all, people. Forward. For all. Group Summary Transforming mobility. Making automotive technology that is smarter, cleaner, safer and lighter. That's what we're passionate about at Magna Powertrain, and we do it by creating world-class powertrain systems. We are a premier supplier for the global automotive industry with full capabilities in design, development, testing and manufacturing of complex powertrain systems. Our name stands for quality, environmental consciousness, and safety. Innovation is what drives us and we drive innovation. Dream big and create the future of mobility at Magna Powertrain. About the Role The role of the Sr. Specialist (w/m/x) Cybersecurity is to ensure that all Cybersecurity requirements and protocols are effectively implemented across all locations. Your Responsibilities Serve as Cybersecurity leader in Magna Powertrain (MPT) for the delivery of Security Programs Leads implementation, support, tracking and compliance enforcement of Corporate and MPT Cybersecurity programs Provides guidance, expert advice, and assesses risk associated with the security architecture of new IT, Business and Product initiatives as it relates to Information Security Define the Group template and structure for Security Standards and Procedures Develops methods and processes for Cybersecurity to ensure confidentiality, integrity and availability for all 3 domains Design standardized security processes and associated procedures to be implemented across MPT Divisions Who we are looking for Bachelors of Science degree in Computer Science, Engineering, Computer Security, Information Systems, or equivalent proof of baseline knowledge. Strong knowledge of various frameworks/regulations such as

ISO 27001/2, TISAX, NIST 800-53, NIST

Cybersecurity Framework, GDPR, SOX, ITIL, COBIT, COSO or similar. relevant professional experience years of multi-domain security experience, Security, or IT management Accredited certifications a plus, such as:

CISM, CISSP, OSCP, GCIH

(Certified Incident Handler) GCIA (Certified Intrusion Analyst) CEH (Certified Ethical Hacker) CCNA (Cisco Certified Network Associate) Your preferred qualifications Experience documenting cybersecurity and IT policies, standards and procedures. Proven record of project execution in a global company with dispersed operations. Experienced in cloud networking architecture and cloud operations experience preferred. Previous

SOC / NOC

experience a plus very good written and spoken English skills What we offer At Magna, you can expect an engaging and dynamic environment where you can help to develop industry-leading automotive technologies. We invest in our employees, providing them with the support and resources they need to succeed. As a member of our global team, you can expect exciting, varied responsibilities as well as a wide range of development prospects. Because we believe that your career path should be as unique as you are. Site Benefits Work-life balance: flexible working time models, trust-based working hours, mobile working Health management: attractive offers to promote health (e.g. company sports groups, free fruit, water stations and company doctor), preventive health check-ups, flu vaccinations, health action days Training and development: structured induction, extensive learning and development opportunities, talent programs, participation in idea management Working environment: modern and ergonomically designed workstations with quiet and communication zones, canteen with regional food and live cooking station Awareness. Unity. Empowerment. At Magna, we believe that a diverse workforce is critical to our success. That's why we are proud to be an equal opportunity employer. We hire on the basis of experience and qualifications, and in consideration of job requirements, regardless of, in particular, color, ancestry, religion, gender, origin, sexual orientation, age, citizenship, marital status, disability or gender identity. Magna takes the privacy of your personal information seriously. We discourage you from sending applications via email to comply with GDPR requirements and your local Data Privacy Law.

Summer Student - IT Security (4-month Term)

Link to Live Job Posting: www.jobs.ca

Location: Calgary, Division No. 6 County

Company: Parkland Health

Job Title: Unclassified

Position Title:

Summer Student - IT Security (4-Month Term)

Team and Location:

IT Security - Calgary At Parkland, our purpose is to Power Journeys & Energize Communities. We are a prominent independent supplier and marketer of fuel and petroleum products and a leading convenience store operator. As One Parkland team, we proudly serve diverse retail, commercial and wholesale customers across Canada, the United States, the Caribbean region, and South America. We power a growing family of locally known brands including Fas Gas Plus, Pioneer, RaceTrac, Superpumper, Ultramar, Chevron, Esso, ON the RUN, Bluewave Energy, Pipeline, Columbia Fuels, Island Petroleum, and Sparlings Propane. We recognize that diversity gives us an edge and inclusion propels us forward. We're also a passionate team of down-to-earth achievers, committed to getting our customers, colleagues and communities further, faster. As such, we welcome talented individuals that have a variety of perspectives, backgrounds, and industry experience who will contribute to the success of our One Parkland team. At Parkland we believe students entering the workplace are the very people who will shape the industry and our future direction. If you are a highly energetic student with initiative and drive, you'll be given the opportunity to learn, gain valuable work experience, work with a great team, and learn about the wide range of departments & functions involved in a large, forward-thinking corporation.

Position Summary:

The IT Summer Student is responsible for providing exceptional support to our IT Security team of Parkland, for the 4-month term. As a member of the IT Security team, you will assist with the day-to-day activities that include installing and troubleshooting various security solutions for the organization. The Summer student will be working closely with the IT Security team to efficiently understand Parkland's information system security and compliance requirements to establish good priorities in security initiatives. Parkland's internship program in cybersecurity is designed to provide a solid foundation of knowledge, experience, and training while giving the students the opportunity to apply what they are learning in school to a real-world setting.

Key Responsibilities:

Monitor and action daily security issues and events generated by our security tools. Operate security technologies to protect systems and information infrastructure. Assist with security incident management and look back reviews. Learn and exercise the knowledge in real time.

Qualifications and Skills:

You are available for a 4-month term beginning on or around May of 2024. You are currently enrolled at a Canadian post-secondary institution working towards a bachelor's degree with a focus on Information Systems, Computer Science, Engineering, or a related discipline. You have exceptional interpersonal skills and possess natural leadership as demonstrated in academic and/or extracurricular activities. You have highly developed verbal and written communication skills to enable you to thrive in a challenging and exciting work environment. You are a creative and analytical thinker with some project management skills who is self-driven and capable of working in a fast-paced environment. You have tenacity and an entrepreneurial spirit, and are passionate about seeking out win-win solutions. You have strong MS Office skills including Word, Outlook, Excel and PowerPoint. You will be part of a global team and must be able to work effectively through a high degree of collaboration and communication through in-person meetings and video conferences. We thank all candidates in advance for their interest, however only those being considered will be contacted. This position will close when a successful candidate is found. Please note, that candidates must be legally able to work in Canada at this time. Parkland regrets that it is unable to sponsor employment Visas. Parkland Corporation is committed to the principles of Employment Equity. We strive to provide accessibility in employment to ensure equal access to employment opportunities for candidates, including persons with disabilities. Parkland Corporation will endeavor to provide accommodation to persons with disabilities in the recruitment process upon request. If you are selected for an interview and you require accommodation due to a disability, please notify us upon scheduling your interview.

Information Security Awareness Training Analyst

Link to Live Job Posting: www.workopolis.com

Location: Calgary, Division No. 6 County

Company: Insync

Job Title: Information Security Analysts

Information Security Awareness Training Analyst Calgary, AB Contract, Fixed term contract Job details Heres how the job details align with your . Job type matching qualification Contract matching qualification Fixed term contract Shift and schedule matching qualification 8 hour shift Location Calgary, AB We are looking for an Information Security Awareness Training Analyst for a 6-month contract position , with possible extensions in Calgary, Alberta. Must be legally entitled to work in Canada. Hybrid schedule, at least 4 days in the office. 8 hours a day, 40 hours a week. It is NOT a remote role. Role summary The role of the Information Security Awareness Training Analyst is to assist in the creation of materials, events, and content which inform, excite, and engage an internal audience. This role specifically focuses on cybersecurity-related content which helps protect the company from a variety of threat actors. Our client is looking for someone who shares their passion for information security and helping our staff stay safer online, a team player who loves to collaborate, a curious and creative mind that enjoys learning. This position reports to a Cyber Security Specialist within the Information & Cyber Security management team.

Travel Requirements:

Minimal travel may be required. Responsibilities You will support the pre-defined awareness program, completing task and producing content as to implement security awareness and training initiatives to reach target audiences through appropriate channels (digital media, print media, training, events, etc.). You will support the collection of feedback, comments, suggestions, and impressions from all employees, as engaged in the various awareness and training activities, for the evolution and improvement of Cyber Culture initiatives. You will measure and evaluate the impact/effectiveness and comprehensiveness of awareness and training initiatives, through dashboards, KPI reports and results collection. ALT wording - Measure and report key performance indicators around security awareness. You will support the organization and planning of new training and awareness initiatives based on the collection of needs, criticalities, or chances for growth, discovered among the employees and through our Information & Cyber security team. You will support the development of tailored cybersecurity role-based/personas, learning paths, design courses that are foundational to desired secure behaviors in compliance with enterprise policies, procedures and standards. You will support configure, deploy, maintain, and support security awareness toolsets. Ensure all regulatory and compliance requirements for security awareness are met. Extend this beyond regulations to drive behavioral change and inspire a security culture within our company. Identify and collaborate with security champions to broaden the security reach within lines of business across the company Be accountable to engage subject matter experts for content and material accordingly for awareness newsletters, activities, and websites Participate and contribute to projects related to cybersecurity awareness including business initiative and complete assigned tasks through projects development, integration, and implementation Create and assist with innovative security awareness campaigns using solution provider and custom -developed tools designed to be flexible and adaptable across a globally diverse employee population (e.g. developers, executives, operations etc) Be able to organize the activities for cybersecurity awareness specific global dates (e.g. October Cyber Security Awareness Month, Data Privacy Week, Infrastructure Security Month) by researching speakers, games, quizzes, and reward activities as directed, provide solutions and result of the speaker events, games, and quizzes Assist in promoting and administering cybersecurity awareness learning related initiatives, tasks, and activities using written, audio and visual mediums. Assist in providing worldwide customer support, problem identification and resolutions in cybersecurity awareness related activities: such as newsletters, awareness campaigns, etc. Report on metrics of participation and effectiveness Experience and Qualifications Bachelors degree in (Corporate/Persuasive) Communication, Security Studies, Crisis Management, Behavioral Science/Psychology, Information Technology, or a related field. Typically, 2+ years relevant work experience in one or more of the following fields: technical, security or privacy education/training, information security, risk management, communications, or other related fields. Experience building information security and/or privacy education and awareness training initiatives, preferably in a large enterprise. Experience running and supporting simulation-based training campaigns such as phishing and voice elicitation

a plus. Professional certifications are considered a plus (e.g.

ISC2 CISSP

Certified Information Systems Security Professional;

PMI-ACP:

PMI Agile Certified Practitioner;

SANS SSAP

Sans Security Awareness Professional Fluent in written and spoken English; any other language skill is considered a plus. Be able to assist in response to business units or regional cybersecurity awareness requests Ability to manage multiple initiatives while adhering to strict deadlines Excellent verbal/written communication, analytical and independent judgment skills with ability to effectively interact with individuals at all levels of responsibility; must be able to positively influence and clearly explain complex information security concepts and technologies for both technical and non-technical audiences. Excellent relationship-building and influencing skills in all mediums and throughout all levels of the organization. Experience in developing and executing gamification or interactive learning (e.g. phish simulations, escape rooms) a plus Basic understanding of adult learning and organizational change principles and theories, such as experiential learning, and self-directed learning a plus. Strong understanding of the relationship between human behavior and security a plus General knowledge of Cybersecurity international standards, law and regulations (e.g.

NIST, ISO27000

). General Knowledge of main IT and OT (Operational Technology) cybersecurity topics, as to tailor awareness, communication and training material for the Group or specific populations. General knowledge of the communication activities to be put in place as to further enhance the response to cybersecurity incidents. Have some knowledge or experience with cybersecurity and be able to articulate its risk and impact in providing customer support, problem identification and resolutions Please note that while all applications are appreciated, only candidates selected for interview will be contacted. InSync Systems Inc. is a privately-owned boutique Canadian Resourcing and Consulting Services Company that works closely with a range of corporate clients across multiple industries to bring them solutions that effectively address their business needs.

Cybersecurity Analysts – Unclassified in Halifax, Halifax County (Jan 2024 - Active)

Cyber Security Analyst Student - Summer 2024 Co-op

Link to Live Job Posting: www.adzuna.ca

Location: Halifax, Halifax County

Company: Unclassified

Job Title: Cybersecurity Analysts

Co-op Location:

Dartmouth

Company:

JD Irving IT Cyber Security Analyst Location:

Halifax, NS Are you excited about the internet of things, data, mobility & innovative solutions while always focused on the delivery of the customer experience? Are you looking for a job which enables you to work with a team of industry-leading professionals? Do you want to gain hands-on experience that could lead to full-time employment upon graduation? Does a job with real responsibilities and making meaningful contributions interest you? Then please, keep reading! We are J.D. Irving Limited & our Information Technology team works with the latest and greatest technology. We are the destination of choice for curious, energetic & collaborative people! With over 350 employees centralized in Saint John, Dieppe, Fredericton, and Halifax, we offer our people the opportunity to add business value to our organization while enjoying the friendly and naturally beautiful lifestyle that only the Maritimes can offer. We invest in continuous professional growth through strong career development programs. With your professional growth as our focus! Come join us and work among the best in the Maritimes! We have a student opportunity! The Co-op Student will work with a dynamic team of IT professionals within JDI IT in Saint John, NB. The successful candidate will be given increasingly challenging assignments to analyze business requests and implement solutions. During the term the Co-op Student will gain exciting experience with a variety of leading-edge technologies in the field of IT Security.

Qualifications:

Education Required:

Enrolled and in good academic standing in Bachelor of Computer Science, Software Engineering, Computer Engineering, or Information Systems

Years of Experience Required:

flexible Positive can-do attitude with an interest in technology High energy Team player Attention to detail All successful applicants must meet requirements for Canadian Controlled Goods Program (CGP), Canadian Government Security clearance, and U.S. International Traffic in Arms Regulations (ITAR). What Will You Learn? Hands on experience with IT Security Opportunity to work on projects and changes supporting multiple lines of business Hands on and practical experience in management of IT security tools and activities including but not limited to: Phishing Tests Data Loss Investigations Incident Handling Security Analytics and Reporting Security Access Requests We have a robust student program at J.D. Irving with formal and informal opportunities to meet and network with people from all across the business, including other students. This is a great experience that will provide you with a challenging, valuable work experience in addition to having the opportunity to work in one of the largest IT employers in Atlantic Canada. To Apply for this

Career Opportunity:

Please apply online and be sure to include a cover letter telling us a bit about yourself and clearly outlining your areas of interest. We would also ask that you include a copy of your academic transcript. We appreciate your interest in our company! The initial review of applications will begin on the deadline date for applying. Applications received after the deadline may not be considered. Only those candidates selected for an interview will be contacted. J.D. Irving, Limited is committed to the principle of equal opportunity in its employment practices and to providing an environment free from discrimination and harassment for all employees.

Additional Information Posting Date:

Jan 19, 2024

Cybersecurity Architect	
Link to Live Job Posting: www.adzuna.ca	
Location: Halifax, Halifax County	Company: Pratt & Whitney
Job Title: Cybersecurity Architects	
<p>Cybersecurity Architect Location:</p> <p>Grand Lake</p> <p>Company:</p> <p>RTX Corporation Date Posted:</p> <p>2024-01-05</p> <p>Country:</p> <p>Canada Location:</p> <p>LOC13056 189</p> <p>Pratt & Whitney Drive Aerotech Business Park,Enfield,Nova Scotia,B2T 1L1,</p> <p>Canada Position Role Type:</p> <p>Unspecified Who we are At Pratt & Whitney, we believe that powered flight has transformed</p> <ul style="list-style-type: none"> • and will continue to transform • the world. That's why we work with an explorer's heart and a perfectionist's grit to design, build, and service the world's most advanced aircraft engines. We do this across a diverse portfolio • including Commercial Engines, Military Engines, Business Aviation, General Aviation, Regional Aviation, and Helicopter Aviation • and as a way of turning possibilities into realities for our customers. <p>This is how we at Pratt & Whitney approach our work, and this is why we are inspired to go beyond. Our expectations Pratt & Whitney is seeking an experienced cyber security professional to join our Global Cyber Security Architecture and Assessment Team. The Security Architect will be responsible for delivering comprehensive security architecture assessment and guidance to ensure both protection by design and cyber compliance for Pratt & Whitney Canada (P&WC). The preferred candidate will be responsible for providing technical security expertise in security architecture and deployment of enterprise systems while ensuring compliance to enterprise policies, industry standards and regulatory requirements. In addition, as a core member of the P&W Cybersecurity team, the candidate will contribute to evaluation of new technologies that support current and future P&W business needs. The position will also require program/project management and oversight of Cybersecurity related projects to include Authority to Operate (ATO) to ensure that they meet business and security requirements in a timely and cost effective manner. The ideal candidate will have practical security understanding with the ability to build and refine capability to deliver secure repeatable solutions for P&W. What your day to day will look like? Provide program level oversight to P&WC security architecture that can be leveraged at corporate and partner business unit levels. Provide oversight of the analysis, requirement development, design, documentation, implementation, and maintenance of complex IT architecture solutions. Estimate costs and schedules and recommend resources required and solutions to problems. Leverage and optimize existing corporate solutions to drive</p>	

standardization and simplification to reduce implementation timelines and costs. Participate as Cybersecurity lead on all P&WC DT initiatives. Understand technical security issues and the implications to the business. Be able to build processes and integrate distributed workflows into consolidated and centralized processes. Interface and collaborate with internal and external partner organizations. Continuously assess and align core processes with strategic Security and Technology direction. The tools you need to be successful Education Bachelor's degree or higher

Technical Certifications:

CISSP, Security+, CSSLP, CEH, OSWE, GREM or equivalent are highly desired but not required.

Professional Certifications:

ITIL, Agile, PMP or equivalent are a plus but not required.

Experience / Qualifications

At least 6-10 years of experience with technical program management, capability development, security/solution architecture and process engineering. Practical experience in developing and interpreting technical diagrams and roadmaps that ensure that our technology meets all security requirements and anticipates future scale and ROI opportunities. Proven experience in secure architecture design and implementation for public and private offerings. Demonstrated ability to articulate effective security principles and controls (SANS, NIST, CIS, etc.) with proven experience applying in context to risk.

Strong ability to communicate:

write clearly and speak authoritatively to different kinds of audiences (customers, technical SME's, and business leaders). Experience defining, implementing, and complying with IT policies, procedures, and standards. Strong interpersonal and communication skills, and experience speaking authoritatively to different kinds of audiences (customers, technical SME's, and business leaders). Experience with metrics development and trending analysis for process improvement. Diversity, Equity & Inclusion The masculine pronoun is used without discrimination and solely for the purpose of making the text easier to read. P&WC is an equal opportunities employer, seeking to promote diversity and inclusion. We will consider applications from all qualified candidates, regardless of their race, colour, religion, sexual orientation, gender, nationality, age, disability, veteran status or any other status protected by law. RTX is An Equal Opportunity/Affirmative Action Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability or veteran status, age or any other federally protected class.

Privacy Policy and Terms:

Click on this link to read the Policy and Terms

Appendix C - Data Sources and Calculations

Lightcast Job Postings

Job postings are collected from various sources and processed/enriched to provide information such as standardized company name, occupation, skills, and geography.

Job Posting Analytics

Lightcast Q3 2023 Data Set

February 2024

1455 Boulevard de Maisonneuve O

Parameters

Select Timeframe: Feb 2019 - Jan 2024

Occupations:

Results should include

Code	Description
21220	Cybersecurity specialists

Regions:

Code	Description
24	Quebec

Minimum Experience Required: Any

Education Level:

Description
Bachelor's degree

Job Type: Exclude Internships

Part-Time / Full-Time :

Full-time (> 32 hours)

Keyword Search:

Posting Type: Newly Posted

Job Postings Overview

1,268

Unique Postings
2,072 Total Postings

252

Employers Competing
77,717 Total Employers

2 : 1

Posting Intensity
Regional Average: 2 : 1

Advertised Salary

There are 41 advertised salary observations (3% of the 1,268 matching postings).

\$104.2K

Median Advertised Salary

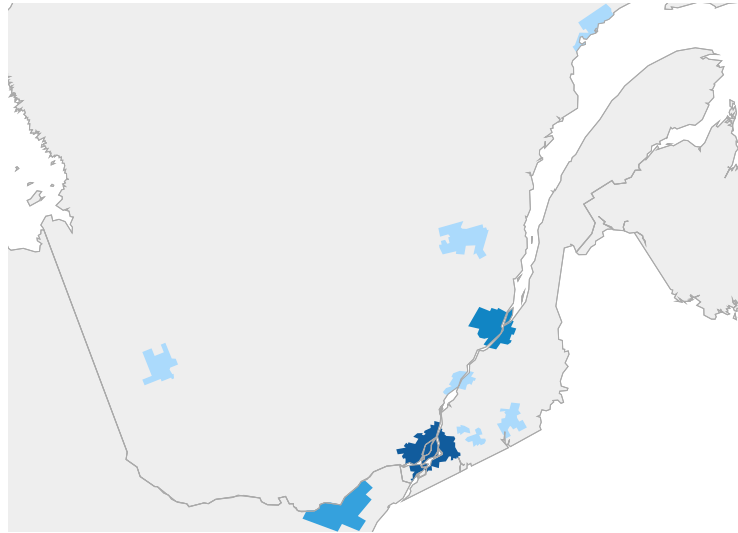
This is \$15.5K above the government recorded median salary for Cybersecurity specialists in Quebec.



Advertised Wage Trend

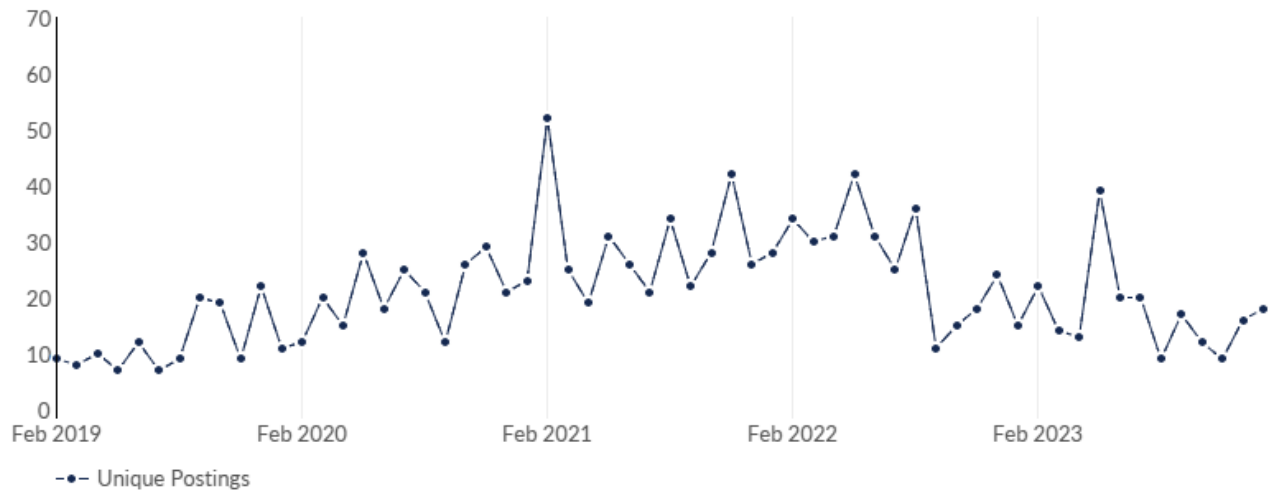
Not enough data for this chart.

Job Postings Regional Breakdown



CMA	Unique Postings (Feb 2019 - Jan 2024)
Montréal	1,123
Québec	93
Ottawa - Gatineau	17
Saguenay	6
Saint-Hyacinthe	3

Unique Postings Trend



Month	Unique Postings	Posting Intensity
Jan 2024	18	1 : 1
Dec 2023	16	2 : 1
Nov 2023	9	1 : 1
Oct 2023	12	1 : 1
Sep 2023	17	2 : 1
Aug 2023	9	2 : 1
Jul 2023	20	2 : 1
Jun 2023	20	2 : 1
May 2023	39	2 : 1
Apr 2023	13	2 : 1
Mar 2023	14	1 : 1
Feb 2023	22	2 : 1

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	0	0%
High school or GED	1	0%
Associate's degree	47	4%
Bachelor's degree	1,268	100%
Master's degree	189	15%
Ph.D. or professional degree	6	0%





















Minimum Education Breakdown

Minimum Education Level	Unique Postings (minimum)	Unique Postings (max advertised)	% of Total (minimum)
High school or GED	1	0	0%
Associate's degree	46	0	4%
Bachelor's degree	1,221	45	96%
Master's degree	0	187	0%
Ph.D. or professional degree	0	6	0%




















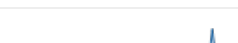
Experience Breakdown

Minimum Experience	Unique Postings	% of Total
No Experience Listed	154	12%
0 - 1 Years	26	2%
2 - 3 Years	258	20%
4 - 6 Years	509	40%
7 - 9 Years	159	13%
10+ Years	162	13%



Top Companies Posting

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Bell	178 / 96	2 : 1 	
Desjardins Group	128 / 67	2 : 1 	
Bonidollars	107 / 58	2 : 1 	
Banque Nationale	118 / 58	2 : 1 	
Morgan Stanley	67 / 50	1 : 1 	
Bombardier	92 / 46	2 : 1 	
Air Canada	98 / 39	3 : 1 	
CGI	49 / 38	1 : 1 	
Intact	43 / 32	1 : 1 	
Canadian National Railway	32 / 25	1 : 1 	



Top Cities Posting

City	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Montreal, Montreal County	1,555 / 982	2 : 1 	
Quebec, Quebec County	114 / 77	1 : 1 	
Dorval, Montreal County	117 / 51	2 : 1 	
Gatineau, Gatineau County	45 / 17	3 : 1 	
Levis, Levis County	21 / 16	1 : 1 	
Longueuil, Longueuil County	20 / 15	1 : 1 	
Boucherville, Longueuil County	24 / 12	2 : 1 	
Laval, Laval County	23 / 11	2 : 1 	
Blainville, Therese-De Blainville County	13 / 10	1 : 1 	
Mirabel, Mirabel County	11 / 8	1 : 1 	





















Top Posted Occupations

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Cybersecurity specialists	2,072 / 1,268	2 : 1 	





















Top Posted Occupations

Occupation	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Cyber / Information Security Engineer / Analyst	2,072 / 1,268	2 : 1 	

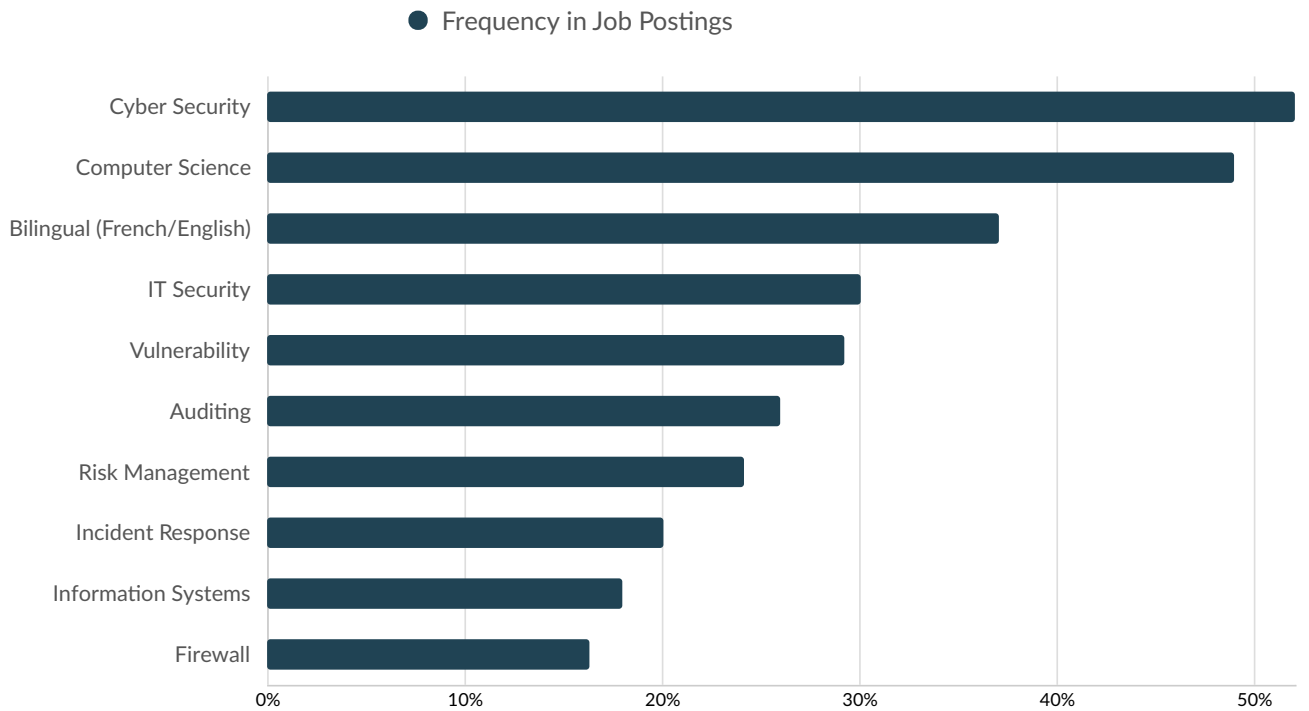
Top Posted Job Titles

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Cybersecurity Specialists	130 / 72	2 : 1 	
Cybersecurity Analysts	95 / 63	2 : 1 	
IT Security Analysts	55 / 42	1 : 1 	
Information Security Analysts	49 / 38	1 : 1 	
Vulnerability Management Analysts	61 / 35	2 : 1 	
Security Advisors	102 / 33	3 : 1 	
Specialist Information Security Analysts	58 / 28	2 : 1 	
Identity and Access Management Managers	41 / 26	2 : 1 	
Cybersecurity Managers	42 / 25	2 : 1 	
Cybersecurity Consultants	31 / 22	1 : 1 	

Top Industries

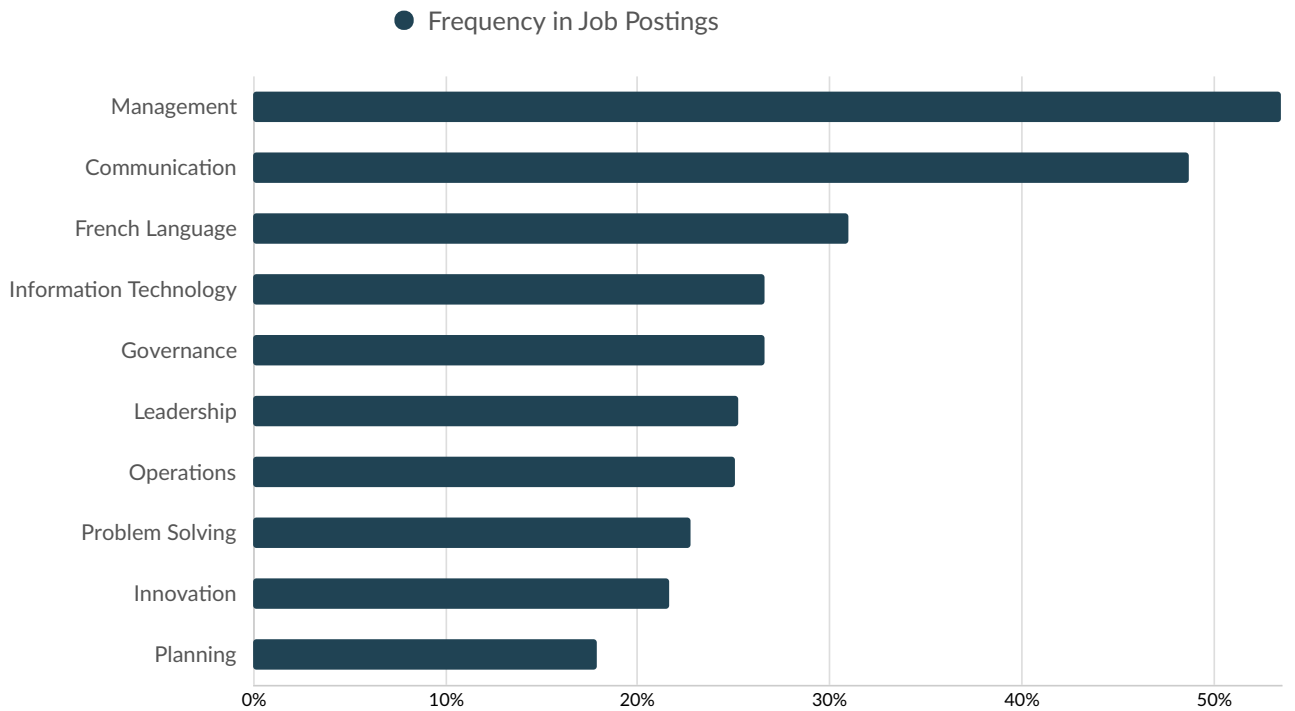
	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Wired Telecommunications Carriers	178 / 96	2 : 1 	
Commercial Banking	164 / 92	2 : 1 	
Credit Unions	129 / 68	2 : 1 	
Administrative Management and General Management Consulting Services	144 / 68	2 : 1 	
Direct Property and Casualty Insurance Carriers	79 / 56	1 : 1 	
Aircraft Manufacturing	98 / 51	2 : 1 	
Miscellaneous Financial Investment Activities	67 / 50	1 : 1 	
Software Publishers	61 / 44	1 : 1 	
Scheduled Passenger Air Transportation	98 / 39	3 : 1 	
Offices of Certified Public Accountants	52 / 39	1 : 1 	

Top Specialized Skills



	Postings	% of Total Postings
Cyber Security	660	52%
Computer Science	621	49%
Bilingual (French/English)	470	37%
IT Security	381	30%
Vulnerability	371	29%
Auditing	329	26%
Risk Management	306	24%
Incident Response	254	20%
Information Systems	228	18%
Firewall	207	16%

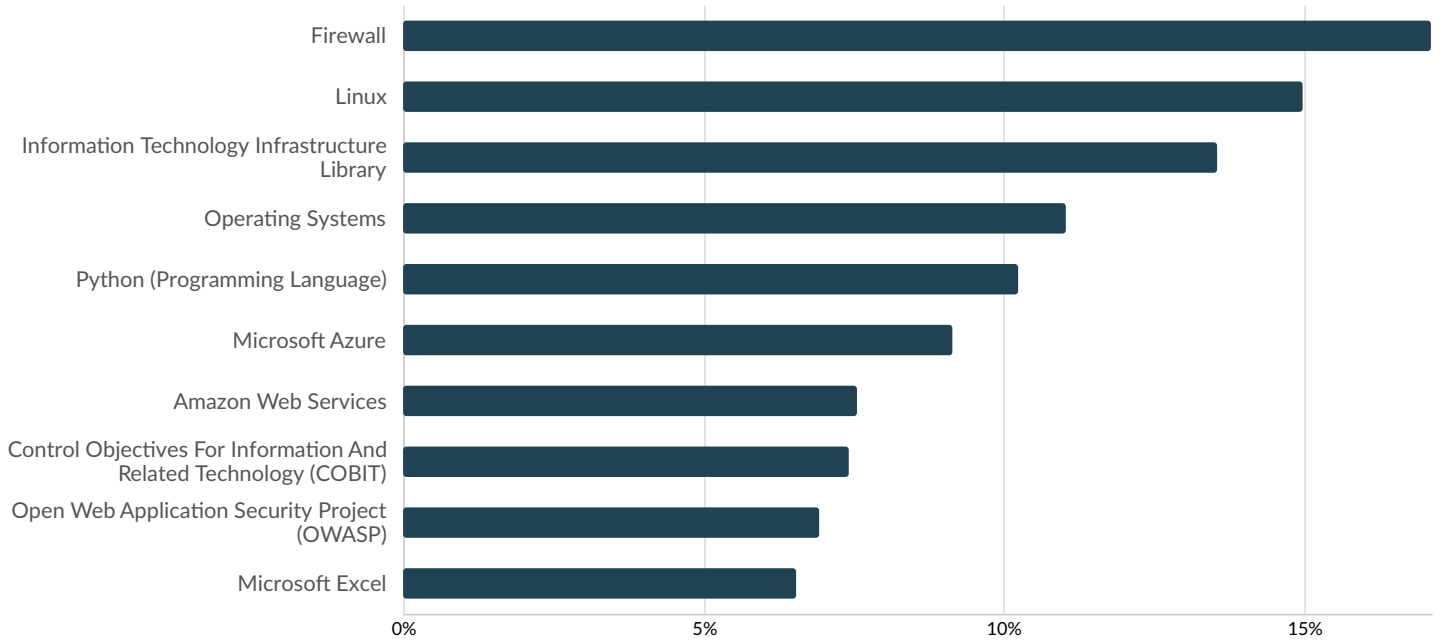
Top Common Skills



	Postings	% of Total Postings
Management	679	54%
Communication	618	49%
French Language	393	31%
Information Technology	338	27%
Governance	338	27%
Leadership	321	25%
Operations	318	25%
Problem Solving	289	23%
Innovation	275	22%
Planning	227	18%

Top Software Skills

● Frequency in Job Postings



	Postings	% of Total Postings
Firewall	217	17%
Linux	190	15%
Information Technology Infrastructure Library	172	14%
Operating Systems	140	11%
Python (Programming Language)	130	10%
Microsoft Azure	116	9%
Amazon Web Services	96	8%
Control Objectives For Information And Related Technology (COBIT)	94	7%
Open Web Application Security Project (OWASP)	88	7%
Microsoft Excel	83	7%

Top Qualifications

	Postings with Qualification
Certified Information Systems Security Professional	542
Certified Information Security Manager	304
Certified Information System Auditor (CISA)	275
GIAC Certifications	212
Certified In Risk And Information Systems Control	112
Offensive Security Certified Professional	96
Certified Ethical Hacker	94
NIST Cybersecurity Framework (CSF)	57
CompTIA Security+	53
Security Clearance	47

Appendix A

Top Posting Sources

Website	Postings on Website (Feb 2019 - Jan 2024)
indeed.com	192
careerjet.ca	170
myworkdayjobs.com	157
taleo.net	128
jobs.ca	120
workopolis.com	111
bce.ca	76
option-carriere.ca	49
jobillico.com	34
nbc.ca	31
aircanada.com	30
localwork.ca	30
jsfirm.com	28
theitjob.com	24
careerbuilder.ca	22
csod.com	22
careerbeacon.com	21
adp.com	19
njoyn.com	15
talentnet.community	15
energyjobline.com	14
deloitte.ca	13
cgi.com	11
jobbank.gc.ca	11
intactfc.com	10

Appendix B

Sample Postings

Incident Response Consultant, Mandiant, Google Cloud

Link to Live Job Posting: www.careerjet.ca

Location: Montreal, Montreal County

Company: Google

Job Title: Incident Response Consultants

Incident Response Consultant, Mandiant, Google CloudGoogleMontreal, QC \$103,000-151,000 per year Permanent Full-time1 day ago

Note:

Google's hybrid workplace includes remote and in-office roles. By applying to this position you will have an opportunity to share your preferred working location from the following: In-office locations: Toronto, ON, Canada; Montreal, QC, Canada; Kitchener, ON, Canada. Remote location(s): Ontario, CA; Canada. Minimum qualifications: Bachelor's degree in Computer Science, a related technical field, or equivalent practical experience. 3 years of Investigative experience with network forensics and log analysis, malware triage analysis, disk, and memory forensics in one or more of the following: Linux or Unix. Ability to travel up to 20% of the time as required. Preferred qualifications: Certifications in Cloud Platforms (e.g., Google Cloud Platform (GCP)). Experience in cloud forensic. Ability to communicate investigative findings and strategies to technical staff, executive leadership, legal counsel, and internal and external clients. Excellent time management skills. Excellent written and verbal communication skills, with the ability to develop documentation and explain technical details in a concise manner. About the job As a Security Consultant, you will be responsible for helping clients effectively prepare for, proactively mitigate, and detect and respond to cyber security threats. Security Consultants have an understanding of computer science, operating system functionality and networking, cloud services, corporate network environments and how to apply this knowledge to cyber security threats. In this role, you will assist clients in navigating technically complex and high-profile incidents, performing forensic analysis, threat hunting, and malware triage. You'll also test client networks, applications and devices by emulating the latest techniques to help them defend against threats, and will be the technical advocate for information security requirements and provide an in-depth understanding of the information security domain. You will also articulate and present complex concepts to business stakeholders, executive leadership, and technical contributors and successfully lead complex engagements alongside cross functional teams. Mandiant Services provides incident response, assessment, transformation, managed detection and response, and training services with direct tactical support. Our incident responders are able to resolve security incidents quickly, effectively, and at scale with complete incident response including investigation, containment, remediation, and crisis management. Mandiant is a recognized leader in dynamic cyber defense, threat intelligence and incident response services. By scaling decades of frontline experience, Mandiant helps organizations to be confident in their readiness to defend against and respond to cyber threats. Mandiant is now part of Google Cloud. The US base salary range for this full-time position is \$103,000-\$151,000 + bonus + equity + benefits. Our salary ranges are determined by role, level, and location. The range displayed on each job posting reflects the minimum and maximum target for new hire salaries for the position across all US locations. Within the range, individual pay is determined by work location and additional factors, including job-related skills, experience, and relevant education or training. Your recruiter can share more about the specific salary range for your preferred location during the hiring process. Please note that the compensation details listed in US role postings reflect the base salary only, and do not include bonus, equity, or benefits. Learn more about . The British Columbia base salary range for this full-time position is

CAD 116,000-131,000

+ bonus + equity + benefits. Our salary ranges are determined by role, level, and location. The range displayed on each job posting reflects the minimum and maximum target for new hire salaries for the position. Within the range, individual pay is determined by work location and additional factors, including job-related skills, experience, and relevant education or training. •

Note:

Disclosure as required by Bill 13 Please note that the compensation details listed in Canada role postings reflect the base salary only, and do not include bonus, equity, or benefits. Learn more about .ResponsibilitiesCollaborate with internal and customer teams to investigate and contain incidents.Lead small-scale investigation, contribute to complex client-facing investigations and examine cloud, endpoint, and network-based sources of evidence.Recognize and codify attacker Tools, Tactics, and Procedures (TTPs) and Indicators of Compromise (IOCs). Build scripts, tools, or methodologies to enhance Mandiant's incident investigation processes that can be applied to current and future investigations.Develop comprehensive and accurate reports and presentations for technical and non-technical audiences.Maintain knowledge of tools and best practices to respond to the techniques, tools, and procedures of advanced persistent threat, financial, and hacktivist threat actors.Google is proud to be an equal opportunity workplace and is an affirmative action employer. We are committed to equal employment opportunity regardless of race, color, ancestry, religion, sex, national origin, sexual orientation, age, citizenship, marital status, disability, gender identity or Veteran status. We also consider qualified applicants regardless of criminal histories, consistent with legal requirements. See also and If you have a disability or special need that requires accommodation, please let us know by completing our .Google

Security architect	
Link to Live Job Posting: www.thorens-solutions.com	
Location: Montreal, Montreal County	Company: Thorens Solutions
Job Title: Security Architects	

Security architect Security architect Company name: Thorens Solutions - Headhunters Activity area : Consulting Engineering /

Engineering Salary :

Salary from \$100,000 to \$150,000 Job type : Permanent - Full time

City :

Montreal Company description Present worldwide, our customer is a leader in the Cybersecurity industry covering more than 50 countries. The company's main strength is that it creates and provides customized managed security services (24-hour surveillance 24/7) and professional services to meet the security and privacy challenges security and confidentiality challenges. Job description The role of the Security Architect is to work with the Managed Security Services team to secure client's information. He is mainly responsible for determining security requirements, planning onboarding activities and implementing MSS solutions. Tasks and Responsibilities Be part of the onboarding of new Systems Security Inc clients by defining security strategy, writing up processes to implement correlation rules and onboarding tasks, following up deployment and insuring quality of communication during onboarding process; Enhance security team accomplishments and competence by planning delivery of solutions; answering technical and procedural questions for less experienced team members; teaching improved processes; mentoring team members. Be an escalation point for Information Security Analysts, Information Security Specialists and Incident Response Managers to assist in solving security issues, correlation rules creation/update and other issues related to log ingestion and SOC monitoring. Design and update correlation rules based on client security control situation and cyber threat circumstance and create and maintain correlation guideline and review process. Determine security requirements by evaluating business strategies and requirements; researching information security frameworks; conducting system security and vulnerability analyses and risk assessments; studying architecture/platform; identifying integration issues; preparing effort estimates. Define security strategies for Systems Security Inc clients by specifying intrusion detection methodologies and equipment; directing equipment and software installation and calibration; preparing preventive and reactive measures; completing documentation. Maintain security monitoring strategy of Systems Security Inc customers by conducting regular customer reviews aimed at aligning our security services/monitoring with customer's constant evolving security challenges. Prepare system security report templates by collecting, analyzing, and summarizing data and trends. Leads technology architecture practices related to Cloud infrastructures. Be part of both customer and internal support in order to identify and solve complex problems related to MSS service support globally. Update job knowledge by tracking and understanding emerging security practices and standards; participating in educational opportunities; reading professional publications; maintaining personal networks; participating in professional organizations. Be part of a senior team leading MSS technical changes aiming at enhancing our services. Qualifications University degree in Computer Science; A minimum of 5 years of relevant experience in IT Security; Excellent understanding of IT Security controls; Excellent knowledge of Linux operating systems (RHEL, CentOS); Good experience with TCP/IP protocol and low-level network troubleshooting (VPN/IPSEC, etc.); Experience in Cloud computing technology including core services, compute and storage, database, Application Programming Interface (API), Microsoft 365, Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), etc.; Experience with on-premise to Cloud migrations or IT transformations; Experience architecting and operating solutions built on Amazon or Azure platforms; Experience with different elements ensuring network security (firewalls, proxies, etc.); Understanding of security frameworks like PCI-DSS or

ISO 27001/27002.

Work conditions Position full-time, permanent; Salary 100,000 to \$150,000; Insurance.

Note :

The masculine is used to lighten the text without prejudice to the feminine form. APPLY Your recruiter Dorothe Giroux Headhunter Being an empathetic person and a good listener, I've always enjoyed supporting people on their professional journey. And as a headhunter, I have the chance to help professionals grow in their careers. Everyone is different, and your career path is important to me. So I'd be delighted to listen carefully to your life experience. 514-842-7846 x 222 dorotheeg@thorens-solutions.com Apply NEXT Montreal 514-842-7846 Toronto 613-699-0021 CONTACT USThorensCandidateEmployerSite mapTerms of usePrivacy policyPowered by

Manager of IT and Information Security

Link to Live Job Posting: fellowapp.bamboohr.com

Location: Montreal, Montreal County

Company: Fellowapp

Job Title: Directors of Information Security

Manager of IT and Information Security/IT & Security Montreal, Quebec (Remote) Hey there I'm Amin, Co-Founder of Fellow. We are seeking an experienced IT and Infosec professional to lead these dual areas for Fellow as we continue our growth in the coming years. About the role You will be the security subject-matter expert and lead all IT administration & Information Security-related matters across the organization. This is a cross-functional role and the candidate will be expected to ensure each team upholds our security bar. Being a relatively small company (~70), you must be able to work independently in these areas to help us scale into the future. Although a combo role of this nature is unorthodox, this is a perfect opportunity for an ambitious individual with tangible experience in both IT administration as well as Security & Compliance to secure a future in a venture backed startup destined for greatness. We're hiring remotely across Canada, but have offices and co-working spaces available in Ottawa, Montreal, and Toronto where you can pop in to work with other Fellow employees when you want some in-person time!

Key IT Responsibilities:

Select, Configure, and Deploy an MDM for our fleet of Macbooks Provide IT support to all employees, including onboarding, offboarding, and any troubleshooting needs that may arise. Manage procurement, licensing, provisioning, and administration of all major software systems needed to run the business Manage all IT asset procurement, maintenance, and disposal as needed Focus on improving IT processes to ensure business continuity and align with our security posture. Monitor employee systems to ensure compliance with security policies

Key Infosec Responsibilities:

Build out and maintain our security compliance programs (e.g. SOC2, ISO27001, HIPAA, etc) Advise on and ensure compliance with data privacy regulations (e.g. GDPR, CCPA, etc) Work with senior leadership to periodically review and update all security policies and BC/DR plans Conduct vendor risk assessments, remediation, and maintain corporate Risk Register Interface with auditors on obtaining ongoing security compliance certifications Manage training for general infosec awareness and security centric development practices Assist the rest of the team with cybersecurity threats and response Work directly with our customers and prospects on security questionnaires, and maintain pre-completed versions of common ones (e.g. CSA CAIQ, CCM, SIG/SIG-Lite)

Minimum Qualifications:

5+ years in IT management (at least 2 in a Mac shop) 2+ years cybersecurity / infosec experience Bachelor's Degree or certification in information systems or equivalent

Resident of Canada Ideal Candidate Profile:

Past experience leading this function at a tech startup Resilient, with strong prioritization skills, able to excel in both quiet and high-pressure periods with focused efficiency and adaptability A hands on leader who is able to lead by example and who can build a team over time Deep expertise across security, privacy, IT audit, and legal security standards, guidelines, and principles Experience enforcing secure coding practices, threat modeling, identity, access management, and security incident response and recovery. CISSP, CISA, CISM or other infosec certifications preferred Direct experience in the following areas Administering Google Workspace, Slack GRC products such as Vanta, Drata, etc MDMs in a Mac environment Drafting infosec policies Security questionnaires Interfacing with external auditors on compliance programs What is Fellow? Fellow.app is a software company that helps teams and organizations level-up their meeting habits to drive productivity, engagement, and accountability before, during, and after every meeting. With Fellow, great meetings are just the start. Our product is the #1 meeting management software on G2, and is trusted by the world's best teams. Established in 2017, our team works remotely from cities across Canada, guided by our mission: Make Work Better for Everyone and that includes our own employees! We're an ambitious team building the next big thing and we'd love to have you on this journey with us. Equal Opportunity Employer At Fellow, we understand the value of having a diverse team. That's why we believe in providing equal opportunity employment regardless of race, national or ethnic origin, colour, religion, age, sex, sexual orientation, gender identity or expression, marital status, family status, genetic characteristics, disability, and conviction. Please let us know if you require accommodation during the recruitment process.

Cybersecurity Specialist	
Link to Live Job Posting: www.careerjet.ca	
Location: Montreal, Montreal County	Company: Expertech
Job Title: Cybersecurity Specialists	
<p>Cybersecurity SpecialistExpertechMontreal, QC Permanent Full-time1 day ago•Permanent position in hybrid mode.Our client, a high-profile company with headquarters in Montreal, is currently looking for a Cybersecurity Specialist to join their team in Montreal. This is a permanent position with attractive compensation and benefits.</p> <p>Responsibilities:</p> <p>Create a roadmap for the definition and implementation of a Cloud security framework.Advise on meeting compliance with information security policies and procedures.Provide expertise in the definition, selection, and implementation of IT Security related controls to the IT Department.Review and offer security recommendations for architecture diagrams.Periodically review and assess cloud instances and integrations (AWS and Azure).Track risks using the GRC tool.Identify Cyber risks, communicate and develop best practice solutions, and implement mitigating controls consistent with company strategy.</p> <p>Qualifications:</p> <p>University degree/technical certification, and/or relevant experience to the role.Over 5 years of IT technology experience with a minimum of 3 years in an IT Security role, in a large company.Extensive Cloud (AWS & Azure), Infrastructure and Architecture understanding.Certification in Information Security (CISSP, ISC, CISM, CCSP) practices and policies an asset.Bilingualism preferred.Refer a friend and get up to \$1500!</p> <p>About Expertech:</p> <p>Connecting talent with employers of choice for over 25 years, Expertech is a leading staffing and recruiting firm. Our goal is to understand both our clients' and our candidates' needs in order to find the perfect match. Our clients include a wide selection of national and international companies in a broad range of industries.ExperTech would like to thank all applicants for their interest in this opportunity, but only shortlisted candidates will be contacted. Please visit our website to see our other available positions: https://expertech.ca/ and follow us on</p> <p>LinkedIn:</p> <p>https://ca.linkedin.com/company/expertech-recruiting .At Expertech, all candidates are welcome regardless of race, nationality, color, religion, gender, gender identity or expression, sexual orientation, disability or age.ExperTech</p>	

Project Cybersecurity Manager	
Link to Live Job Posting: Posting is no longer active	
Location: Montreal, Montreal County	Company: Alstom
Job Title: Cybersecurity Project Managers	
<p>Project Cybersecurity Manager Date: 14 Jan 2024</p> <p>Location: Montreal, QC, CA Company:</p> <p>Alstom Req ID: 418299 Leading societies to a low carbon future, Alstom develops and markets mobility solutions that provide the sustainable foundations for the future of transportation. Our product portfolio ranges from high-speed trains, metros, monorail, and trams to integrated systems, customised services, infrastructure, signalling and digital mobility solutions. Joining us means joining a caring, responsible, and innovative company where more than 70,000 people lead the way to greener and smarter mobility, worldwide Join Alstom in this career-defining role as a Cybersecurity Project Manager based in Montreal, Canada. Your objective in this role is to analyse Tender / Project security needs (including laws and local regulations) and determine security objectives and main security risk strategies. You will do this by working with a global team of engineers and project managers; in a diverse and inclusive environment.</p> <p>Your activities would be: Plan security activities within the development life cycle, estimate costs and duration, their impacts related to tender/project execution and identify training needs.Cybersecurity context and Cybersecurity Risk AnalysisCybersecurity Architecture definition and requirement allocationCascading requirements to suppliers, Managing Third Parties RisksApplication of Cybersecurity Assurance LevelDefinition of Cybersecurity Operating ProceduresEvaluation of the Tender/Project achieved Cybersecurity levelManage the budget of the project regarding CybersecurityManage the subcontractors in his/her perimeterProvide support during technical design meetings for cybersecurity activitiesReport on Tender / Project Cybersecurity statusIn case of external Cybersecurity audit, manage the relationship with auditors and establish lessons learned Education Bachelor's Degree in EngineeringCybersecurity certifications preferred Experience 5+ years of experience related to Cybersecurity in general and deployment experience of security technologies.Experience working with industrial companiesExperience with Poject ManagementExperience working with engineering teamsExperience reporting and comunicating critical information to stakeholders Competencies & Skills Engineering BackgroundKnowledge of main Cybersecurity standards and regulations, such as ISO 2700X, 62443, NIST, NIS, IEC 62443 Knowledge of some Cybersecurity solutions and areasArchitecture concepts and techniques of systems and networks, operating systems, and associated programming languages.Knowledge of the main techniques for evaluating systems security Alstom is the leading company in the mobility sector, solving the most interesting challenges for tomorrow's mobility. That's why we value inquisitive and innovative people who are passionate about working together to reinvent mobility, making it smarter and more sustainable. Day after day, we are building an agile, inclusive and responsible culture, where a diverse group of people are offered opportunities to learn, grow and advance in their careers, with</p>	

options across functions and geographic locations. Are you ready to join a truly international community of great people on a challenging journey with a tangible impact and purpose?

Equal opportunity statement:

Alstom is an equal opportunity employer committed to creating an inclusive working environment where all our employees are encouraged to reach their full potential, and individual differences are valued and respected. All qualified applicants are considered for employment without regard to race, colour, religion, gender, sexual orientation, gender identity, age, national origin, disability status, or any other characteristic protected by local law.

Job Type:

Experienced

Appendix C - Data Sources and Calculations

Lightcast Job Postings

Job postings are collected from various sources and processed/enriched to provide information such as standardized company name, occupation, skills, and geography.

Library Report
For the Proposed

Bachelor of Engineering in Cybersecurity Engineering & Bachelor of Science in Cybersecurity

Chloe Lei, Teaching & Research Librarian, Engineering and Computer Science

Created: 4 April, 2024

Purpose

The purpose of this report is to assess the adequacy of available library resources to support the proposed undergraduate programs in cybersecurity at Concordia University. The report identifies resources and funding required to support the program.

Summary

The Library can adequately support this new program within its current collections budget.

Concordia programs and comparators

Currently the Faculty offers two specialized Master's programs in cybersecurity and a PhD program in Information and Systems Engineering, all under the Concordia Institute for Information Systems Engineering (CIISE). The Steering Committee identified comparator programs at Polytechnique Montréal, Université du Québec en Outaouais, and Seneca College. These institutions' collection will be used as comparators throughout this report.

Collections Assessment

Monographs

Current Collection Growth

CIISE is supported under the budget envelope for Computer Science and Software Engineering (CSSE). For the current fiscal year, 2023/2024, the budget allocation for CSSE is \$11,300. For the previous three complete fiscal years, our budget allocations and monograph acquisitions have been as follows:

Year	Allocation	Monographs acquired
2022/2023	12,400	49
2021/2022	13,500	45
2020/2021	13,500	52

Note that there has been a slight decrease in the monograph budget for CSSE since 2022/2023 due to a revised library budget allocation formula taking into account multiple variables such as programs, enrolment data and ebook package expenditure by subject area.

In addition to monographs acquired using the subject allocations specified above, the library also subscribes to or purchases a number of ebook packages with relevant content for cybersecurity. These include:

- IEEE-Wiley ebooks
- Institution of Engineering and Technology (IET) ebooks
- Knovel ebooks
- O’Reilly ebooks (formerly Safari Books Online)
- ScienceDirect ebooks
- Springer ebooks
- Synthesis Digital Library of Engineering and Computer Science ebooks
- Taylor & Francis ebooks (GENERAENGINEERINGnetBASE collection)

A collection analysis was performed in 10 subject areas that fall within cybersecurity to determine the average percent growth in area in the past three years at Concordia and the comparator institutions.

	Concordia	Polytechnique Montréal	Université du Québec en Outaouais	Seneca College
<i>Annual percent growth (3 year average)</i>	29.89	28.78	24.60	29.71

Recommendation

Concordia’s annual collection growth is in line with the comparator institutions. The Library can adequately support this new program with its current monograph budget allocation.

Journals

Current collection

The Library has a substantial collection of electronic journals, which are usually acquired in bundles, either from a publisher or an aggregator. These subscription bundles, generally managed on a national or provincial level by the Canadian Research Knowledge Network (CRKN) consortium of academic libraries or the Partenariat des bibliothèques universitaires du Québec (PBUQ), include journals relevant to cybersecurity. They include:

- ACM (Association for Computing Machinery)
- APS (American Physical Society)
- Elsevier
- IEEE (Institute of Electrical and Electronics Engineers)
- Sage

- Springer
- Taylor & Francis
- Wiley-Blackwell.

Needs assessment

A core list of 65 journals in cybersecurity was compiled and compared to Concordia's current holdings. Those titles where Concordia had no access or where there was an embargo on current access were prioritized as either high, medium or low priorities. There was 1 title to which Concordia has no access and it is not deemed to be high priority.

Recommendation

The Library's current journal subscriptions and packages are adequate for the needs of the proposed program.

Databases

Current collection

The Library has many subscriptions to electronic databases and indexes. Those most relevant to cybersecurity include:

Database name	Database content
<i>ACM Digital Library</i>	Contents published by ACM, covering computer science, information technology, software engineering, networking, wireless communications, and other computing-related subjects.
Compendex	A bibliographic database covering engineering research literature since 1884.
IEEE Xplore	Contents published by IEEE, covering many fields including circuits, communication systems, computer engineering, information theory, robotics, power engineering, signal processing, telecommunications.
Inspec	A bibliographic database covering physics, electrical engineering, electronics and computing.
Inspec Analytics	A research intelligence tool to help research professionals explore global trends in physics, engineering and technology research, released by the IET (Institute of Engineering and Technology).
<i>JoVE</i>	The Journal of Visualized Experiments (JoVE) is a peer-reviewed journal and database of experiments in video format.
Knovel	A platform for engineering technical references, including interactive features for material property data and math equations.
Scopus	This multidisciplinary database has over 19,000 titles from more than 5,000 international publishers, including journals and conference proceedings in science and technology.
SPIE Digital Library	A collection of contents in optics and photonics research by the Society of Photo-Optical Instrumentation Engineers.
Web of Science	This multidisciplinary database covers the journal literature of the sciences through the Science Citation Index Expanded, which includes the fields of science and engineering.

Needs assessment

A review of computer science and software engineering databases available at Polytechnique Montréal, Université du Québec en Outaouais, and Seneca College was completed. There were 2 databases available at other institutions that are not available at Concordia. One of them is held by 2 of the comparators, and the other one is held by only 1 of the comparators.

Recommendation

The Library's current database subscriptions are adequate for the needs of the proposed program.

Collections Recommendation Summary

The Library can adequately support this new program within its current collections budget.

Additional Library services

All university libraries in Quebec use the same shared services platform called Sofia, which allows students and faculty from all Quebec university libraries to search, access, request and borrow items from the collections of the 18 partner institutions.

The interlibrary loan service, also integrated in Sofia, provides students and faculty with the ability to request materials that are not available in the Concordia Library collection, including electronic delivery of journal articles.

Academic Support

The Teaching & Research Librarian for Engineering and Computer Science is available to conduct course-specific library workshops, as requested by faculty, and provides help with library research on an individual basis for all students and faculty in the Departments. A team of professional librarians and trained staff help Concordia students and faculty with their basic information and research questions at the Ask Us Desks, as well as via email and chat.

Conclusion

A careful assessment was made of the library's current monograph holdings and journal subscriptions to determine the adequacy of available library resources to support the two proposed undergraduate programs in cybersecurity at Concordia University. It was determined that the Library can adequately support the new programs within its current collections budget.



This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Dr. Manar AMAYRI

Correspondence language: English

Contact Information

The primary information is denoted by (*)

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This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Protected when completed

Dr. Manar AMAYRI

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	No

Degrees

- 2017/10 Doctorate, Smart buildings, Institut national polytechnique de Grenoble
Supervisors: Professor Stephane Ploix, 2014/9 - 2017/10
- 2014/7 Master's Thesis, Smart Grids and Buildings, Institut national polytechnique de Grenoble
- 2010/8 Master's Thesis, Energy, Damascus University
- 2006/8 Bachelor's, Electrical Power Engineering, Damascus University

Recognitions

- 2022/7 Best paper award, IEA/AIE 2022
International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems
Prize / Award
Best paper award with my student Jiaxun Guo, Prof. Nizar bouguil and Prof. Wentao Fan, 35th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2022), "A Generalized Inverted Dirichlet Predictive Model for Activity Recognition using Small Data"
- 2022/5 Best poster award IBPSA France 2022
International Building Performance Simulation Association.
Prize / Award
Best poster award IBPSA France 2022 with my student Estefania Alvarez, Prof. Stephane Ploix, and Prof. Patrick Reignier, IBPSA France 2022, International Building Performance Simulation Association, "Apprentissage interactif et cooperatif pour l' experimentation de son chez-soi"

User Profile

Research Specialization Keywords: Machine learning, Explainable AI, Smart buildings, Energy management systems, Interactive learning, Human-in-the-loop AI, Self-consumption, Data mining

Employment

2023/1	Assistant Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Assistant Professor Tenure Status: Tenure Track
2020/12 - 2022/12	Affiliate Assistant professor, Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science CIISE, Concordia University Full-time Tenure Status: Non Tenure Track
2020/9 - 2022/12	Maitresse de Conferences ENSE3, Institut national polytechnique de Grenoble Full-time, Assistant Professor Tenure Status: Tenure
2020/4 - 2020/8	Postdoctoral Research Fellow CIISE, Concordia University Full-time Tenure Status: Non Tenure Track
2019/1 - 2020/2	Postdoctoral Research Fellow GSCOP, Institut national polytechnique de Grenoble Full-time Tenure Status: Non Tenure Track
2017/11 - 2018/12	Postdoctoral Research Fellow Centre national de la recherche scientifique (CNRS), Institut national polytechnique de Grenoble Full-time Tenure Status: Non Tenure Track

Leaves of Absence and Impact on Research

2022/9 - 2022/9	Medical, Institut national polytechnique de Grenoble I took leave of absence of two weeks because of medical reasons. Although it has not affected my overall research performance, I unfortunately missed few deadlines related to papers and proposals submissions.
2022/6 - 2022/6	Medical, Institut national polytechnique de Grenoble I took leave of absence of one week because of medical reasons. It has not affected my overall research performance.

Research Funding History

Awarded [n=5]

2023/9 - 2026/8 Co-investigator	AI-Based Approaches to Improve Business Intelligence Solutions, Grant Funding Sources: PROMPT-Québec Total Funding - 701,000 Portion of Funding Received - 350,000 Funding Competitive?: Yes
2023/1 - 2024/12	Concordia Start-Up research grant, Grant

Principal Investigator	<p>Funding Sources: Concordia University Concordia Start-UP research Total Funding - 50,000 Portion of Funding Received - 50,000 Funding Competitive?: No</p>
2023/6 - 2024/5 Principal Applicant	<p>Occupancy Estimation using Passive WiFi Sensing, Grant</p> <p>Funding Sources: Concordia University AI2 Spring Call for Proposals (Collaborations with Industry: Aerial.ai) Total Funding - 77,870 Portion of Funding Received - 77,870 Funding Competitive?: Yes</p>
2023/4 - 2024/3 Principal Investigator	<p>Decarbonization Solutions using AI, Grant</p> <p>Funding Sources: Concordia University Concordia Sustainable Transitions Team Research Initiative Total Funding - 20,000 Portion of Funding Received - 20,000 Funding Competitive?: Yes</p>
2023/1 - 2023/12 Principal Investigator	<p>Human in the Loop Machine Learning for Smart Buildings, Grant</p> <p>Funding Sources: Concordia University Applied AI Institute's Funding Program Total Funding - 8,000 Portion of Funding Received - 8,000 Funding Competitive?: Yes</p>
Completed [n=3]	
2021/9 - 2023/4 Co-investigator	<p>LearningHome: Cooperative and active learning for the responsible improvement of energy practices in the residential sector, Grant</p> <p>Funding Sources: Agence nationale de la recherche (ANR) (France) Total Funding - 576,000 Portion of Funding Received - 60,000 Funding Competitive?: Yes</p>
2022/1 - 2022/12 Principal Applicant	<p>Machine learning for self-consumption monitoring, Grant</p> <p>Funding Sources: Institut National Polytechnique de Grenoble Total Funding - 15,000 Portion of Funding Received - 15,000 Funding Competitive?: No</p>
2020/4 - 2022/3 Collaborator	<p>Machine Learning and Data Mining for Smart Buildings, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 186,666 Portion of Funding Received - 40,000 Funding Competitive?: Yes</p>

Student/Postdoctoral Supervision

Bachelor's [n=9]

2023/5 - 2023/8 Principal Supervisor	Hamdi Barkous, Ecole Polytechnique, Tunisia Thesis/Project Title: Time series forecasting, Mitacs Globalink (research internship from May 2023 to August 2023) Present Position: Undergrad Student
2022/4 - 2022/7 Principal Supervisor	Joseph Hespel (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Design of a method for evaluating the impact of occupant usage in a home context Present Position: Master's Student, Institut National Polytechnique de Grenoble
2022/2 - 2022/5 Principal Supervisor	Matthieu Corman (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Design of a management system for the charging of electric vehicles in GreEN-ER Present Position: Master's Student, Institut National Polytechnique de Grenobl
2022/2 - 2022/5 Principal Supervisor	Valentin Basto-Poultier (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Non-Intrusive Load Monitoring Using machine learning techniques Present Position: Master's Student, Institut National Polytechnique de Grenoble
2021/9 - 2022/2 Principal Supervisor	Fournier Camille (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: EV Charging Stations Load Forecasting Using Learning Techniques Present Position: Master's Student, Institut National Polytechnique de Grenoble
2021/9 - 2022/2 Principal Supervisor	Alexandre Boueil (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: On Short-Term Load Forecasting Using Learning Techniques Present Position: Master's Student, Institut National Polytechnique de Grenoble
2021/9 - 2022/2 Principal Supervisor	Thomas Guillot Goguet (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: On Short Term Load Forecasting for Model Predictive Controller Application Present Position: Master's Student, Institut National Polytechnique de Grenoble
2021/9 - 2022/2 Principal Supervisor	Dina Calise (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Use of transfer learning for occupancy estimation Present Position: Master's Student, Institut National Polytechnique de Grenoble
2021/3 - 2021/7 Principal Supervisor	Jawher Dridi (Completed) , Ecole Polytechnique, Tunisia Thesis/Project Title: Transfer learning for activity recognition in smart buildings, Mitacs Globalink (research internship from March 2021 to July 2021) Present Position: Undergrad Student

Master's Equivalent [n=3]

2022/1 - 2022/8 Principal Supervisor	Mohammad Ali Kazan (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: On Short-Term Load Forecasting Using Learning Techniques Present Position: PhD student, Institut National Polytechnique de Grenoble
2020/2 - 2020/8 Principal Supervisor	Almudena Maroto (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Automatic generation of home reports for Smart Homes and analysis of their impact on behaviour changes Present Position: PhD student, Institut National Polytechnique de Grenoble

2020/1 - 2021/9
Co-Supervisor Joana Nunes Nicolau Baptista da Silva (Completed) , Lisbon Higher Technical Institute
Thesis/Project Title: Cooperative and Interactive Learning to estimate human behaviour for energy applications.
Present Position: PhD student, Lisbon Higher Technical Institute

Master's Thesis [n=14]

2023/9 - 2025/12
Principal Supervisor Naailah Mahamoodally, Concordia University
Thesis/Project Title: Explainable transfer learning
Present Position: Master student

2023/9 - 2025/12
Principal Supervisor Belal Mahmud, Concordia University
Thesis/Project Title: Machine Learning for *Electric Vehicle*, *Data Augmentation and Demand Forecasting*,
Present Position: Master student

2023/5 - 2025/4
Principal Supervisor Nicholas Simo (In Progress) , Concordia University
Student Degree Expected Date: 2025/4
Thesis/Project Title: Anomaly detection in HVAC systems
Present Position: Master Student, Concordia University

2023/5 - 2025/4
Principal Supervisor Maher Dissem (In Progress) , Concordia University
Student Degree Expected Date: 2025/4
Thesis/Project Title: Reinforcement learning for smart building applications
Present Position: Master Student, Concordia University

2022/9 - 2024/8
Principal Supervisor Skander Chouchène (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: Transfer learning for energy disaggregation
Present Position: Master Student

2022/1 - 2023/12
Principal Supervisor Oussama Sghaier (Completed) , Concordia University
Thesis/Project Title: Optimizations strategies using MILP approach for energy applications
Present Position: Master Student

2022/1 - 2023/8
Principal Supervisor Jawher Dridi (Completed) , Concordia University
Thesis/Project Title: Unsupervised Domain Adaptation for Estimating: Occupancy and Recognizing Activities in Smart Buildings Un Unsupervised Domain Adaptation for Estimating: Occupancy and Recognizing
Present Position: Research associate, Concordia University

2021/9 - 2023/6
Co-Supervisor Ahmed Rebei (Completed) , Concordia University
Thesis/Project Title: Load Forecasting using Meta-Learning
Present Position: Research associate, Université de Montreal

2021/1 - 2023/5
Co-Supervisor Mohammad Akbar (Completed) , Concordia University
Thesis/Project Title: Data Driven Disaggregation Methods for Electricity Based Energy Consumption for Smart Homes
Present Position: PhD student, Concordia University

2020/2 - 2021/10
Co-Supervisor Soudabeh Tabarsaii (Completed) , Concordia University
Thesis/Project Title: Non-Intrusive Load Monitoring Using Additive Time Series Modeling via Finite Mixture Models Aggregation
Present Position: AISTORM Inc Toronto Canada

2020/1 - 2022/6
Co-Supervisor Oumayma Dalhoumi (Completed) , Concordia University
Thesis/Project Title: Bayesian Matrix Factorization and Applications
Present Position: Data Scientist Ericsson

2019/9 - 2021/12 Co-Supervisor	Jiaxun Guo (Completed) , Concordia University Thesis/Project Title: Occupancy Estimation and Activity Recognition in Smart Buildings using Mixture-Based Predictive Distributions Present Position: PhD student, Concordia University
2019/9 - 2021/8 Co-Supervisor	Zixiang Xian (Completed) , Concordia University Thesis/Project Title: Generative Models Based on the Bounded Asymmetric Gaussian Distribution Present Position: Instructor, United International College, Hong Kong, China
2019/1 - 2020/12 Co-Supervisor	Yogesh Pawar (Completed) , Concordia University Thesis/Project Title: Machine learning for intrusion detection Present Position: Research associate, Université de Montreal

Doctorate [n=6]

2022/1 - 2025/12 Principal Supervisor	Jiaxun Guo (In Progress) , Concordia University Student Degree Expected Date: 2025/12 Thesis/Project Title: Deep generative models for energy applications Present Position: PhD student
2020/9 - 2024/8 Co-Supervisor	Viet Tra (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: Explainable machine learning models for outliers removal, anomaly detection, and HVAC systems diagnosis Present Position: PhD student
2020/9 - 2023/9 Co-Supervisor	Nana Kofi Baabu Twum Duah (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Theoretical and practical implementation of Model Predictive Controller in industrial environments Present Position: Postdoctoral Fellow, INRIA
2020/1 - 2023/12 Co-Supervisor	Soroush Samareh Abolhassani (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Machine learning for Urban Scale Building Energy Modeling Present Position: PhD student
2019/9 - 2023/3 Co-Supervisor	Kamal Maanicshah, (Completed) , Concordia University Thesis/Project Title: Novel Mixture Allocation Models for Topic Learning Present Position: Data Scientist Busspass Inc. Montreal
2019/1 - 2023/5 Co-Supervisor	Hussein Albazzaz (Completed) , Concordia University Thesis/Project Title: Mixture-Based Clustering and Hidden Markov Models for Energy Management and Human Activity Recognition: Novel Approaches and Explainable Applications Present Position: Unknown

International Collaboration Activities

2919/1 - 2024/12	Research Collaborator, Portugal I started this collaboration thanks to the Pessoa program (https://www.campus france.org/fr/pessoa). I extensively collaborated with WattIs company (https://watt-is.com) and Dr. Carlos Augusto Santos Silva to analyse how load disaggregation can improve interactive learning (by generating new features) of consumer practices.
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2018/2 - 2018/6 Research Collaborator, Netherlands
I collaborated with QUBY company (<https://www.quby.com>) in order to develop optimal control solutions to improve QUBY's control system applied for both high and low efficient buildings, and development of advanced capabilities for smart thermostats.

Committee Memberships

2024/2 - 2026/12 Committee Member, International Conference on Intelligent Information Technology (ICIIT 2024), ACM
2019/1 - 2022/12 Committee Member, International Conference on Developments in eSystems Engineering (DeSE), IEEE

Other Memberships

2023/1 Master's and PhD theses committees, Concordia University
2021/9 - 2022/12 Member of the International relations committee, Institut national polytechnique de Grenoble
2020/9 - 2022/12 Master's and PhD theses committees, Institut national polytechnique de Grenoble

Publications

Journal Articles

1. O. Dalhoumi*, N. Bouguila, M. Amayri and W. Fan. (2023). Bayesian Matrix Factorizations for Semi-Bounded Data. IEEE Transactions on Neural Networks and Learning Systems. 34(6): 3111 - 3123.
Published
Refereed?: Yes, Open Access?: No
2. A. Rebei*, M. Amayri and N. Bouguila. (2023). FSNet: A Hybrid Model for Seasonal Forecasting. IEEE Transactions on Emerging Topics in Computational Intelligence, <https://doi.org/10.1109/TETCI.2023.3290050>.
In Press
Refereed?: Yes, Open Access?: No
3. J. Guo*, M. Amayri, N. Bouguila and W. Fan. (2023). Liouville-Based Predictive Models for Occupancy Estimation Using Small Training Data. IEEE Internet of Things Journal, DOI: 10.1109/JIOT.2023.3289337.
In Press
Refereed?: Yes, Open Access?: No
4. M. Akbar*, M. Amayri, N. Bouguila. (2023). A novel non-intrusive load monitoring technique using semi-supervised deep learning framework for smart grid. Building Simulation.
Accepted
Refereed?: Yes, Open Access?: No
5. J. Dridi*, M. Amayri, N. Bouguila. (2023). Unsupervised domain adaptation with and without access to source data for estimating occupancy and recognizing activities in smart buildings. Building and Environment. 246(110651)
Published
Refereed?: Yes, Open Access?: No

6. A. Al-gumaei*, M. Azam, M. Amayri, N. Bouguila. (2023). ICA and IVA bounded multivariate generalized Gaussian mixture based hidden Markov models. *Engineering Applications of Artificial Intelligence*. 123: 106345.
Published
Refereed?: Yes, Open Access?: No
7. H. Al-Bazzaz*, M. Azzam*, M. Amayri and N. Bouguila. (2023). Unsupervised Mixture Models on the Edge for Smart Energy Consumption Segmentation with Feature Saliency. *Sensors*. 23(No. 19): Article 8296.
Published
Refereed?: Yes, Open Access?: No
8. Z. Luo*, M. Amayri, W. Fan, K. Ihou, N. Bouguila,. (2023). Parallel Inference for Cross-Collection Latent Generalized Dirichlet Allocation Model and Applications. *Expert Systems With Applications* <https://doi.org/10.1016/j.eswa.2023.121720>.
Accepted
Refereed?: Yes, Open Access?: No
9. Z. Luo*, M. Amayri and W. Fan, N. Bouguila. (2023). Cross-Collection Latent Beta-Liouville Allocation Model Training with Privacy Protection and Applications. *Applied Intelligence*. 53: 17824–17848.
Published
Refereed?: Yes
10. J. Guo*, M. Amayri, F. Najar, W. Fan and N. Bouguila. (2023). Occupancy Estimation in Smart buildings using predictive modeling in imbalanced domains. *Journal of Ambient Intelligence and Humanized Computing*. 14(8): 1868-5145.
Published
Refereed?: Yes, Open Access?: No
11. J. B. Silva*, M. Amayri, S. Ploix, P. Reignier and C. S. Silva. (2022). Cooperative and Interactive Learning to Estimate Human Behaviours for Energy Applications. *Energy and Buildings*. 258: Article 111727.
Published
Refereed?: Yes, Open Access?: No
12. V. Tra*, M. Amayri and N. Bouguila. (2022). Unsupervised Outlier Detection using Neural Network-Based Mixtures of Probabilistic Principal Component Analyzers for Building Chiller Fault. *Building and Environment*. 225: Article 109620.
Published
Refereed?: Yes, Open Access?: No
13. M. Payet*, M. David, P. Laurent, M. Amayri, S. Ploix and F. Garde. (2022). Modelling of Occupant Behavior in Non-residential Mixed-Mode Buildings: The Distinctive Features of Tropical Climate. *Energy and Buildings*. 259: Article 111895.
Published
Refereed?: Yes, Open Access?: No
14. V. Tra*, M. Amayri, and N. Bouguila. (2022). Outlier Detection Via Multiclass Deep Autoencoding Gaussian Mixture Model for Building Chiller Diagnosis. *Energy and Buildings*. 259: Article 111893.
Published
Refereed?: Yes, Open Access?: No
15. S. Samareh Abolhassani*, A. Zandifar, N. Ghourchian, M. Amayri, N. Bouguila, and U. Eicker. (2022). Improving Residential Building Energy Simulations Through Occupancy Data Derived From Commercial Off-the-Shelf Wi-Fi Sensing Technology. *Energy and Buildings*. 272: Article 112354.
Published
Refereed?: Yes, Open Access?: No

16. S. Samareh Abolhassani*, M. Amayri, N. Bouguila, and U. Eicker. (2022). A New Workflow for Detailed Urban Scale Building Energy Modeling using Spatial Joining of Attributes for Archetype Selection. *Journal of Building Engineering*. 46: Article 103661.
Published
Refereed?: Yes, Open Access?: No
17. M. Amayri, C. S. Silva, H. Pombeiro and S. Ploix. (2022). Flexibility Characterization of Residential Electricity Consumption: a machine learning approach. *Sustainable Energy, Grids and Networks*.32: Article 100801.
Published
Refereed?: Yes, Open Access?: No
18. K. Ihou*, M. Amayri and N. Bouguila. (2022). Stochastic Variational Optimization of a Hierarchical Dirichlet Process Latent Beta-Liouville Topic Model. *ACM Transactions on Knowledge Discovery from Data*. 16(5): Article 84,.
Published
Refereed?: Yes, Open Access?: No
19. J. Dridi*, M. Amayri and N. Bouguila,. (2022). Transfer Learning for Estimating Occupancy and Recognizing Activities in Smart Buildings. *Building and Environment*. 217: Article 109057.
Published
Refereed?: Yes, Open Access?: Yes
20. O. Bouhamed*, M. Amayri, and N. Bouguila. (2022). Weakly Supervised Prediction using Training Data Collected via Interactive Learning. *Sensors*. 22(9): Article 3186.
Published
Refereed?: Yes, Open Access?: Yes
21. J. Guo*, M. Amayri, N. Bouguila and W. Fan. (2021). A Hybrid of Interactive Learning and Predictive Modeling for Occupancy Estimation in Smart Buildings. *IEEE Transactions on Consumer Electronics*. 67(4): 285-293.
Published
Refereed?: Yes, Open Access?: No
22. B. F. Balouch*, M. Amayri, N. Bouguila and U. Eicker,. (2021). On Short-Term Load Forecasting Using Machine Learning Techniques and a Novel Parallel Deep LSTM-CNN Approach. *IEEE Access*. 9: 31191-31212.
Published
Refereed?: Yes, Open Access?: Yes
23. K. Maanicshah*, M. Amayri, N. Bouguila, and W. Fan. (2021). Unsupervised Learning using Variational Inference on Finite Inverted Dirichlet Mixture Models with Component Splitting. *Wireless Personal Communications*. 119: 1817-1844.
Published
Refereed?: Yes, Open Access?: No
24. M. Amayri, S. Ploix, N. Bouguila and F. Wurtz. (2020). Database Quality Assessment for Interactive Learning: Application to Occupancy Estimation. *Energy and Buildings*. 209: Article 109578.
Published
Refereed?: Yes, Open Access?: No
25. M. Amayri, S. Ploix, N. Bouguila, and F. Wurtz. (2020). Estimating Occupancy using Interactive Learning with a Sensor Environment: Real-Time Experiments. *IEEE Access*. 7(1): 53932-53944.
Published
Refereed?: Yes, Open Access?: Yes

26. R. Nasfi*, M. Amayri and N. Bouguila. (2020). A Novel Approach for Modeling Positive Vectors with Inverted Dirichlet-Based Hidden Markov Models. Knowledge-Based Systems. 192: Article 105335.
Published
Refereed?: Yes, Open Access?: No
27. M. Amayri, S. Ploix, H. Kazimi, Q. Ngo, and A. Safadi. (2019). Estimating Occupancy from Measurements and Knowledge Using Bayesian Network for Energy Management. Journal of Sensors. 2019
Published
Refereed?: Yes, Open Access?: Yes

Books

1. N. Bouguila, W. Fan, and M. Amayri. (2022). Hidden Markov Models and Applications, Unsupervised and Semi-Supervised learning. ISBN 978-3-030-99142-5
Published, Springer
Refereed?: Yes
2. S. Ploix, M. Amayri and N. Bouguila. (2021). Towards Energy Smart Homes: Algorithms, Technologies and Applications. ISBN 978-3-030-76476-0
Published, Springer
Refereed?: Yes

Book Chapters

1. M. Amayri, S. Ali and N. Bouguila. (2022). Machine Learning for Activity Recognition in Smart Buildings. S. Ploix, M. Amayri and N. Bouguila,. Towards Energy Smart Homes: Algorithms, Technologies and Applications. : 199-229.
Published, Springer
Refereed?: Yes
2. W. Hou, W. Fan, M. Amayri and N. Bouguila. (2022). A Novel Continuous Hidden Markov Model for Modeling Positive Sequential Data. N. Bouguila, W. Fan and M. Amayri. Hidden Markov Models and Applications. : 199-210.
Published, Springer
Refereed?: Yes
3. C. A. Santos Silva, M. Amayri and K. Basu. (2022). Characterizations of Energy Demand and Energy Services Using Model-Based and Data-Driven Approaches. S. Ploix, M. Amayri and N. Bouguila. Towards Energy Smart Homes: Algorithms, Technologies and Applications. : 229-248.
Published, Springer
Refereed?: Yes
4. Z. Xian*, M. Azam*, M. Amayri, W. Fan and N. Bouguila. (2022). Bounded Asymmetric Mixture-Based Hidden Markov Models. N. Bouguila, W. Fan and M. Amayri. Hidden Markov Models and Applications. : 33-58.
Published, Springer
Refereed?: Yes

Conference Publications

1. J. Dridi*, M. Amayri and N. Bouguila. (2024). Unsupervised Adversarial Domain Adaptation for Estimating Occupancy and recognizing Activities in Smart Buildings. 9th International Conference on Intelligent Information Technology (ICIIT 2024),
Paper
Accepted
Refereed?: Yes, Invited?: No

2. M. Dissem*, M. Amayri and N. Bouguila. (2024). Robust Interactive HMI for Occupancy Estimation in Smart Buildings. IEEE Concumser Communication & Networking Conference (ICNC 2024),
Paper
Published
Refereed?: Yes, Invited?: No
3. O. Sghaier*, M. Amayri and N. Bouguila. (2024). Data Clustering with Libby-Novick Beta-Liouville Mixture Models: A Minimum Message Length Approach. 9th International Conference on Intelligent Information Technology (ICIIT 2024),
Paper
Accepted
Refereed?: Yes, Invited?: No
4. H. AL-Bazzaz*, M. Azam, M. Amayri, N. Bouguila. (2023). Enhancing Human Action Recognition with Asymmetric Generalized Gaussian Mixture Model-Based Hidden Markov Models and Bounded Support. IEEE International Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
5. H. Al-Bazzaz*, M. Azam, M. Amayri, and N. Bouguila. (2023). Refining Nonparametric Mixture Models with Explainability for Smart Building Applications. IEEE International Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
6. M. Bouzid*, M. Amayri, N. Bouguila. (2023). Addressing Load Forecasting Challenges in Industrial Environments Using Time Series Deep Models. 6th International Conference on Computational Intelligence and Intelligent Systems (CIIS 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
7. H. Al-Bazzaz*, M. Azam, M. Amayri, and N. Bouguila. (2023). Enhanced Energy Characterization and Feature Selection using explainable Non-parametric AGGMM. 15th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
8. M. Akbar*, M. Amayri, N. Bouguila, F. Wurtz, B. Delinchant. (2023). Assessing the Effectiveness of Supervised and Semi-supervised NILM Approaches in an Industrial Context. 6th International Conference on Computational Intelligence and Intelligent Systems (CIIS 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
9. H. Al-Bazzaz*, M. Azam, M. Amayri, and N. Bouguila. (2023). Explainable Robust Smart Meter Data Clustering for Improved Energy Management. IEEE International Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No

10. F. Rezapoor Nikroo*, M. Amayri, and N. Bouguila. (2023). HMMs Recursive Parameter Estimation for Semi-Bounded Data Modeling: Application to Occupancy Estimation in Smart Buildings. International Conference on Smart Cities and Green ICT Systems (SMARTGREENS 2023), (81-88)
Paper
Published
Refereed?: Yes, Invited?: No
11. Z. Luo*, M. Amayri, W. Fan, N. Bouguila. (2023). A Selective Supervised Latent Beta-Liouville Allocation for Document Classification. 36th International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems, IEA/AIE 2023, (37-48)
Paper
Published
Refereed?: Yes, Invited?: No
12. K. Maanicshah*, M. Amayri and N. Bouguila. (2023). Novel Topic Models for Content Based Recommender Systems. 25th International Conference on Enterprise Information Systems (ICEIS 2023), (138-145)
Paper
Published
Refereed?: Yes, Invited?: No
13. H. Barkous*, M. Amayri and N. Bouguila. (2023). A Comprehensive Analysis of a Hybrid Deep Learning Model for Midterm Electric Load Forecasting. IEEE International Conference on Smart City (Smart City-2023),
Paper
Published
Refereed?: Yes, Invited?: No
14. O. Sghaier*, M. Amayri, and N. Bouguila. (2023). Multivariate Beta Normality Scores Approach for Deep Anomaly Detection in Images Using Transformations. IEEE International Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
15. V. Tra*, H. Al-Bazzaz*, M. Amayri, and N. Bouguila. (2023). Unsupervised Anomaly Detection using Deep Autoencoding Mixture of Probabilistic Principal Component Analyzers. 8th International Conference on Intelligent Information Technology, ICIT '23, (203–208)
Paper
Published
Refereed?: Yes, Invited?: No
16. M. K. Akbar*, M. Amayri, N. Bouguila. (2023). Deep Learning Based Solution for Appliance Operational State Detection and Power Estimation in Non-Intrusive Load Monitoring. 36th International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems, IEA/AIE 2023,
Paper
Accepted
Refereed?: Yes, Invited?: No
17. M. Amayri and Y. Pawar*. (2023). Occupancy Estimation in Smart Buildings: Impact of Data Quality on Feature Selection. 6th International Conference on Computational Intelligence and Intelligent Systems (CIIS 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No

18. K. Maanicshah*, N. Manouchehri, M. Amayri, and N. Bouguila. (2023). Novel Topic Models for Parallel Topics Extraction from Multilingual Text. 15th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2023), (297-309)
Paper
Published
Refereed?: Yes, Invited?: No
19. F. Rezapoor Nikroo*, M. Amayri and N. Bouguila. (2022). Recursive Parameter Estimation of Generalized Dirichlet Hidden Markov Models: Application to Occupancy Estimation in Smart Buildings. IEEE International Conference on Industry 4.0, Artificial Intelligence, and Communication Technology (IAICT 2022), (90-96)
Paper
Published
Refereed?: Yes, Invited?: No
20. N. Twum-Duah*, M. Amayri, S. Ploix, and F. Wurtz. (2022). Optimal Sizing of Stationary Battery Storage Taking into Account Indirect Flexibility in Tertiary Buildings: Use case of an Electric Vehicle Community. CIRED Porto Workshop 2022 E-mobility and power distribution systems, (518-522)
Paper
Published
Refereed?: Yes, Invited?: No
21. W. Fan, M. Amayri and N. Bouguila. (2022). Stochastic Expectation Propagation Learning for Unsupervised Feature Selection. 14th International Conference on Computational Collective Intelligence (ICCCI 2022), (674-686)
Paper
Published
Refereed?: Yes, Invited?: No
22. K. Prabhakaran*, J. Dridi*, M. Amayri and N. Bouguila. (2022). Explainable K-Means Clustering for Occupancy Estimation. The 12th International Conference on Sustainable Energy Information Technology (SEIT), (326-333)
Paper
Published
Refereed?: Yes, Invited?: No
23. F. Rezapoor Nikroo*, M. Amayri and N. Bouguila. (2022). Recursive Parameter Estimation on Beta-Liouville Hidden Markov Models. International Conference on Electrical, Computer and Energy Technologies (ICECET 2022), (1-7)
Paper
Published
Refereed?: Yes, Invited?: No
24. E. Alvarez*, M. Amayri, S. Ploix, and P.Reignier. (2022). Apprentissage interactif et coopératif pour l'experimentation de son chez-soi. IBPSA France, International Building Performance Simulation Association. [Received Best Poster Award],
Paper
Published
Refereed?: Yes, Invited?: No
25. K. Maanicshah*, M. Amayri and N. Bouguila,. (2022). Improving Topic Quality with Interactive Beta-Liouville Mixture Allocation Model. IEEE Symposium Series on Computational Intelligence (SSCI 2022), (1143-1148)
Conference Date: 2022/12
Paper
Published
Refereed?: Yes, Invited?: No

26. J. Guo*, M. Amayri, W. Fan and N. Bouguila. (2022). Beta-Liouville and Inverted Beta-Liouville Based Predictive Models for Occupancy Detection using Small Training Data. IEEE Symposium Series on Computational Intelligence (SSCI 2022), (223-230)
Conference Date: 2022/12
Paper
Published
Refereed?: Yes, Invited?: No
27. O. Dalhoumi*, M. Amayri and N. Bouguila. (2022). A Review of Neural Networks for Buildings Occupancy Measurement. IEEE International Conference on Industry 4.0, Artificial Intelligence, and Communication Technology (IAICT 2022), (29-35)
Conference Date: 2022/7
Paper
Published
Refereed?: Yes, Invited?: No
28. J. Guo*, M. Amayri, W. Fan and N. Bouguila. (2022). A Generalized Inverted Dirichlet Predictive Model for Activity Recognition using Small Data, [Received Best Paper Award]. 35th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2022), (431-442)
Conference Date: 2022/7
Paper
Published
Refereed?: Yes, Invited?: No
29. O. Bouhamed*, M. Amayri and N. Bouguila. (2022). T-DPnet: transformer-Based Deep Probabilistic Network for Load Forecasting. 8th International Conference on Time Series and Forecasting (ITISE 2022),
Conference Date: 2022/6
Paper
Published
Refereed?: Yes, Invited?: No
30. Y. Pawar*, M. Amayri and N. Bouguila. (2022). An Accelerated Nonparametric Bayesian Approach for Anomaly Detection with Feature Selection. International Electrical Engineering Congress (iEECON2022), (1-4)
Conference Date: 2022/3
Paper
Published
Refereed?: Yes, Invited?: No
31. O. Graja*, F. Najar*, M. Amayri, and N. Bouguila. (2021). Inverted Dirichlet State Space Model for Time Series Forecasting. 30th IEEE International Symposium on Industrial Electronics (ISIE 2021), (1-6)
Paper
Published
Refereed?: No, Invited?: Yes
32. A. Rebei*, O. Dalhoumi*, N. Manouchehri*, A. Baghdadi*, M. Amayri and N. Bouguila. (2021). Variational Learning of the Mixture of Shifted-Scaled Dirichlet Distributions via Entropy Splitting. International Symposium on Networks, Computers and Communications (ISNCC), (75-78)
Conference Date: 2021/11
Paper
Published
Refereed?: No, Invited?: Yes

33. Z. Xian*, M. Azam, M. Amayri, and N. Bouguila. (2021). Model Selection Criterion for Multivariate Bounded Asymmetric Gaussian Mixture Model. 29th European Conference on Signal Processing (EUSIPCO2021), (1436-1440)
Conference Date: 2021/8
Paper
Published
Refereed?: Yes, Invited?: No
34. N. Manouchehri*, O. Dalhoumi*, M. Amayri, and N. Bouguila. (2021). Online Variational Learning of Shifted Scaled Dirichlet Mixture. The 30th IEEE International Symposium on Industrial Electronics (ISIE 2021), (1-6)
Conference Date: 2021/6
Paper
Published
Refereed?: Yes, Invited?: No
35. M. S. Ahmadzadeh*, N. Manouchehri*, H. Ennajari, M. Amayri, N. Bouguila and W. Fan. (2021). Entropy-Based Variational Learning of Finite Inverted Beta-Liouville Mixture Model. 34rd International FLAIRS Conference (FLAIRS-34),
Conference Date: 2021/5
Paper
Published
Refereed?: No, Invited?: Yes
36. Y. Pawar*, M. Amayri and N. Bouguila. (2021). Performance Evaluation of Adversarial Learning for Anomaly Detection using Mixture Models. 22nd IEEE International Conference on Industrial Technology (IEEE ICIT 2021), (913-918)
Conference Date: 2021/3
Paper
Published
Refereed?: Yes, Invited?: No
37. Y. P. Pawar*, M. Amayri and N. Bouguila. (2020). Performance Evaluation of Geometric Area Analysis Technique for Anomaly Detection Using Trapezoidal Area Estimation. International Symposium on Networks, Computers and Communications (ISNCC),
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
38. N. Manouchehri*, O. Dalhoumi*, M. Amayri and N. Bouguila. (2020). Variational Learning of a Shifted Scaled Dirichlet Model with Component Splitting Approach. 3rd IEEE International Conference on Artificial Intelligence for Industries (AI4I), (75-78)
Conference Date: 2020/9
Paper
Published
Refereed?: Yes, Invited?: No
39. M. Amayri, S. Ploix, F. Najjar, N. Bouguila, and F. Wurtz. (2020). A Statistical Process Control Chart Approach for Occupancy Estimation in Smart Buildings. IEEE Symposium Series on Computational Intelligence (SSCI 2019), (1729-1734)
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No

40. N. Kofi*, M. Amayri, F. Wurtz, S. Ploix. (2019). Evaluation of Energetic Performance of Net Zero Energy Buildings. 2019 IEEE International Smart Cities Conference (ISC2 2019), (136-142)
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
41. H. Nguyen*, M. Rahmanpour*, N.Manouchehri*, K. Mannichah*, M. Amayri, and N. Bouguila. (2019). A Statistical Approach for Unsupervised Occupancy Detection and Estimation in Smart Buildings. 2019 IEEE International Smart Cities Conference (ISC2 2019), (414-419)
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
42. J. Goffart, M.Woloszyn, X. Faure, F. Wurtz, M. Amayri, S. Ploix, P. Schneuwly. (2019). Overview of a Large Scale Monitoring Project of Energy Positive Houses: Complementarity Between Simulations and Measurements. 16th IBPSA International Conference and Exhibition (BS 2019),
Conference Date: 2019/9
Paper
Published
Refereed?: No, Invited?: Yes
43. N. Zamzami, M. Amayri, N. Bouguila, and S. Ploix. (2019). Online Clustering for Estimating Occupancy in an Office Setting. 28th IEEE International Symposium on Industrial Electronics (ISIE 2019), (2195-2200)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
44. N. Manouchehri*, J. S. Kalsi*, M. Amayri, and N. Bouguila. (2019). Finite Two-Dimensional Beta Mixture Model Selection and Applications. 28th IEEE International Symposium on Industrial Electronics (ISIE 2019), (1407-1412)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
45. M. Amayri, H. Haller, S. Ploix, F. Wurtz, and G. Debizet. (2019). Indicators for self-assessment of human practices in homes. 8th International Conference on Smart Cities and Green ICT Systems (SMARTGREENS 2019), (116-122)
Conference Date: 2019/5
Paper
Published
Refereed?: Yes, Invited?: No
46. F. Alalyan*, N. Zamzami, M. Amayri, and N. Bouguila. (2019). An Improved K-Medoids Algorithm Based on Binary Sequences Similarity Measures. 6th International Conference on Control, Decision and Information Technologies (CODIT 2019), (1723-1728)
Conference Date: 2019/4
Paper
Published
Refereed?: No, Invited?: Yes

47. D. Ankam*, N. Bouguila, and M. Amayri. (2019). Beta-Liouville Regression and Applications. 6th International Conference on Control, decision and Information Technologies (CODIT 2019), (1740-1745)
Conference Date: 2019/4
Paper
Published
Refereed?: Yes, Invited?: No
48. M. Amayri, H. Kazimi, and S. Ploix. (2018). Decision tree and Parametrized classifier for Estimating occupancy in energy management. 5th International Conference on Control, Decision and Information Technologies (CODIT 2018), (397-402)
Conference Date: 2018/4
Paper
Published
Refereed?: Yes, Invited?: No
49. M. Amayri, H. Kazimi, and S. Ploix. (2018). Estimating occupancy in residential context using Bayesian Networks for energy management. 20th International Conference on Machine Learning for Prediction and Control (ICMLPC 2018),
Conference Date: 2018/2
Paper
Published
Refereed?: Yes, Invited?: No



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Date Submitted: 2023-10-13 10:33:24

Confirmation Number: 1678293

Template: NSERC_Researcher

Professor Chadi Assi

Correspondence language: English

Contact Information

The primary information is denoted by (*)

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Email

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Protected when completed

Professor Chadi Assi

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	No

Degrees

- 2003/4 Doctorate, Electrical Engineering, City Univ of New York-Grad School & Univ. Ctr
- 2001/12 Master's Thesis, Electrical Engineering, City Univ of New York-Grad School & Univ. Ctr
- 1997/8 Bachelor's, Electrical Engineering, Université Libanaise

Recognitions

- 2023/4 Concordia Valedictorian - 2,000
Concordia University
Honor
My former PhD student Mohamad El Hattab received the Concordia University Distinguished Doctoral Dissertation Prize – engineering category.
- 2023/2 Concordia University President Media Outreach Award
Concordia University
Honor
Media Outreach Award
- 2022/4 - 2027/5 Concordia University Research Chair, Tier 1 - 100,000
Concordia University
Honor
Research chair provided by Concordia.
- 2020/9 IEEE Fellow
IEEE
Honor
IEEE Fellow is the highest grade of membership and is recognized by the technical community as a prestigious honor and an important career achievement.
- 2020/8 Provost Circle of Distinction
Concordia University
Distinction
Award given to only few members of the academic body of the university for outstanding achievement.

- 2020/5 Governor General Gold Medal Award (Technology, Industry and the Environment category)
Concordia University
Honor
My former PhD student Dr Mohanad Chariti received this award for best PhD thesis.
- 2018/5 Doctoral Prize In Engineering and Computer Science
Concordia University
Honor
My former PhD student Dr Mosaddek Hossain Kamal Tushar received this award for best PhD thesis in the faculty of engineering and computer science for excellence in research under my supervision.
- 2017/5 - 2022/4 Concordia University Research Chair, Tier 1
Concordia University
Honor
Concordia University Research Chair, Tier II, in the area Advanced Internet Technologies.

User Profile

Research Specialization Keywords: Data centers and cloud networks, Network security, Optical Networks, Optimization, Performance analysis and modeling, Resource allocation, Routing and Dimensioning, Wireless Networks

Employment

- 2013/6 Full professor
CIISE, Concordia University
Full-time
Tenure Status: Tenure
- 2007/5 - 2013/5 Associate Professor
CIISE, Engineering, Concordia University
Full-time
Tenure Status: Tenure
- 2011/5 - 2012/6 Graduate Program Director
CIISE, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2009/9 - 2010/6 Visiting professor
Computer Engineering, Kuwait University
Full-time
Tenure Status: Non Tenure Track
Teaching and Research
- 2003/8 - 2007/5 Assistant Professor
Engineering and Computer Science, Concordia University
Full-time
Tenure Status: Tenure Track
- 2002/9 - 2003/7 Visiting Researcher
Nokia Research Center, Nokia Research Center
- 2000/8 - 2000/12 Research Assistant
Optical Research Group, Telcordia Technologies (BELLCORE)

2000/6 - 2000/8 Summer Research Student
Optical R&D Lab, Sorrento Networks

Research Funding History

Awarded [n=9]

2022/5 - 2027/4
Principal Investigator Concordia University Research Chair Tier I in Future Cellular Networks”, Research Chair
Funding Sources:
Concordia University
Concordia Chair
Total Funding - 100,000
Portion of Funding Received - 100,000
Funding Competitive?: Yes

2021/6 - 2026/5
Principal Applicant Toward Intelligent and Resilient Smart Cities with Energy-Vehicle-Human Interactions, Grant
Funding Sources:
Canada Foundation for Innovation (CFI)
Total Funding - 1,800,000
Portion of Funding Received - 1,800,000
Funding Competitive?: Yes
Co-applicant : Amr Youssef; Arash Mohammadi; Jun Yan; Mohsen Ghafouri; Mourad Debbabi; Walter Lucia

2022/1 - 2025/12
Co-applicant 5G network security, Anomaly detection, DDOS, Grant
Funding Sources:
National Consortium for Cyber Security
Total Funding - 1,000,000
Portion of Funding Received - 1,000,000
Funding Competitive?: Yes
Co-applicant : Lingyu Wang; Suryadipta Majumdar;
Principal Investigator : Mourad Debbabi

2022/4 - 2025/3
Principal Applicant Large scale integration of EVs into the smart grid : A comprehensive cyber physical study and security assessment, Grant
Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Alliance
Total Funding - 193,500
Portion of Funding Received - 193,500
Funding Competitive?: Yes

2019/5 - 2024/4
Principal Investigator Enabling Technologies for hyperconnected, data driven, and service oriented networks of the future, Grant
Funding Sources:
NSERC
Discovery grant
Total Funding - 200,000
Portion of Funding Received - 100
Funding Competitive?: Yes

2022/1 - 2023/7 STRAT Large Scale Data Center Networks, Grant

Principal Applicant	<p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Total Funding - 250,000 Portion of Funding Received - 250,000 Funding Competitive?: Yes</p>
2020/8 - 2022/5 Co-applicant	<p>5G, autonomous, intelligence, robotics, Grant</p> <p>Funding Sources: Mitacs - Cienna Total Funding - 60,000 Portion of Funding Received - 100 Funding Competitive?: Yes</p>
2017/5 - 2020/4 Principal Applicant	<p>Sécurité au Niveau de la Couche Physique pour Lutter Contre les Menaces de Sécurité dans les Systèmes sans Fil, Grant</p> <p>Funding Sources: Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) Equipe Total Funding - 205,740 Portion of Funding Received - 144,018 Funding Competitive?: Yes</p> <p>Co-applicant : Leszek Szczecinski</p>
2014/5 - 2019/4 Principal Applicant	<p>Efficient, Scalable and Survivable Design for next generation Virtualized Data Center for Cloud Services, Grant</p> <p>Funding Sources: NSERC Discovery grant Total Funding - 255,000 Portion of Funding Received - 255,000 Funding Competitive?: Yes</p>
Completed [n=4]	
2022/1 - 2022/12 Principal Applicant	<p>HTTP/2 anomaly detection in 5G service-based architecture, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Total Funding - 30,000 Portion of Funding Received - 30,000 Funding Competitive?: Yes</p>
2017/5 - 2022/4 Principal Applicant	<p>Concordia University Research Chair (Tier I) in Advanced Internet Technologies, Research Chair</p> <p>Funding Sources: Concordia University Concordia Chair Total Funding - 100,000 Portion of Funding Received - 100,000 Funding Competitive?: Yes</p>
2018/5 - 2021/4 Co-applicant	<p>Vers une gestion efficace des ressources dans les réseaux d'accès radio des prochaines générations des réseaux mobiles, Grant</p> <p>Funding Sources: FQRNT</p>

Team Grant
 Total Funding - 162,000
 Portion of Funding Received - 54,000
 Funding Competitive?: Yes
 Co-applicant : Tho Le Ngoc;
 Principal Applicant : Wessam Ajib

2019/8 - 2020/7
 Principal Applicant

Simulator for studying the Impact of EV charging on power grid, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
 Engage
 Total Funding - 25,000
 Portion of Funding Received - 100
 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=13]

2023/5 - 2024/12 Principal Supervisor	Ahmad Alayan (In Progress) , Concordia University Student Degree Expected Date: 2025/1 Thesis/Project Title: 5G network security Present Position: Student
2023/1 - 2024/12 Principal Supervisor	Youssef Maghrebi (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Digital Twin, AI, 6G Present Position: Student
2023/1 - 2024/12 Principal Supervisor	Rinith Reghunath (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Cyber Security Monitoring, EV ecosystem, Distribution Present Position: Student
2021/9 - 2023/8 Principal Supervisor	Mohammad Adraa (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Data Center networks Present Position: MASc student
2020/9 - 2022/3 Principal Supervisor	Samer Fayad (In Progress) , Concordia University Thesis/Project Title: Visible Light Communications. Present Position: MASc student
2020/1 - 2021/8 Principal Supervisor	Tony Nasr (Completed) , Concordia University Thesis/Project Title: EV charging infrastructure security and CPS security. Present Position: MASc student
2019/1 - 2021/12 Principal Supervisor	Mirabelle Dib (Completed) , Concordia University Thesis/Project Title: IOT security, Malware Present Position: MASc student, CGI
2019/1 - 2021/8 Principal Supervisor	Shirin Rezasoltani (Completed) , Concordia University Thesis/Project Title: Age of Information in Cellular Systems Present Position: MASc student, Ottawa

2018/8 - 2020/5
Principal Supervisor Houssam El Houssini (Completed) , Concordia University
Thesis/Project Title: EV security, cyber security, IoT security
Present Position: MASc student

2018/8 - 2020/5
Principal Supervisor Joseph Antoun (Completed) , Concordia University
Thesis/Project Title: Vehicular networks, self organized networks, 5G.
Present Position: MASc student

2018/1 - 2020/1
Principal Supervisor Huu Phuc (Completed) , Concordia University
Thesis/Project Title: Next generation wireless networks, UAVs, Caching
Present Position: PhD student

2017/9 - 2019/5
Principal Supervisor Nouha Kheraf (Completed) , Concordia University
Thesis/Project Title: Mobile edge computing, IoTs
Present Position: MASc student

2017/1 - 2018/1
Principal Supervisor Amine Arfaoui (Completed) , Concordia University
Thesis/Project Title: Physical Layer security in Visible Light Communications
Present Position: PhD student, Concordia University

Doctorate [n=25]

2023/1 - 2026/1
Principal Supervisor Yefei Zhang (In Progress) , Concordia
Student Degree Expected Date: 2025/1
Thesis/Project Title: Adversarial attacks, machine learning, Explainability, IoT malware
Present Position: Student

2022/9 - 2026/12
Principal Supervisor Ali Amhaz (In Progress) , Concordia University
Student Degree Expected Date: 2025/4
Thesis/Project Title: 5G networks, Multiple Access, Integrated Sensing and Communications
Present Position: PhD student

2022/9 - 2025/1
Principal Supervisor Mahdi Soleymani (In Progress) , Concordia University
Student Degree Expected Date: 2025/1
Thesis/Project Title: Control theoretic approaches for attack detection in EV charging
Present Position: PhD student

2022/9 - 2024/12
Co-Supervisor Ahmadreza Abazari (In Progress) , concordia University
Student Degree Expected Date: 2025/1
Thesis/Project Title: Smart Grids, EV Ecosystem, Security
Present Position: Student

2021/9 - 2025/8
Principal Supervisor Shreya Kisha (In Progress) , Concordia University
Student Degree Expected Date: 2025/1
Thesis/Project Title: Rate Splitting Multiple Access in 6G
Present Position: PhD student

2021/9 - 2025/8
Principal Supervisor Nassr AL-DAHABREH (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Modeling and learning EV traffic profile.
Present Position: PhD student

2021/5 - 2024/12
Principal Supervisor Nathalie Wehbe (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Cyber security, IoT
Present Position: PhD student

2020/9 - 2024/1 Principal Supervisor	Mohammad Sayed (In Progress) , Concordia University Thesis/Project Title: Cyber Physical Systems, Electrical Vehicles, Security Present Position: PhD student
2020/9 - 2024/3 Principal Supervisor	Khaled Sarieedine (In Progress) , Concordia University Thesis/Project Title: Cyber security, EVs, Present Position: PhD student
2019/8 - 2022/12 Principal Supervisor	Ricardo Ayala (In Progress) , Concordia University Student Degree Expected Date: 2025/12 Thesis/Project Title: Ransomware Present Position: PhD student
2018/9 - 2022/4 Principal Supervisor	Mohammad Kadry (Completed) , Concordia University Thesis/Project Title: NOMA, Joint Transmissions, Multicell, RIS Present Position: Ericsson Ottawa
2018/9 - 2022/5 Principal Supervisor	Mohamed Al Mekhlafi (Completed) , Concordia University Thesis/Project Title: 5G and beyond, wireless access Present Position: Postdoc, REMI - ETS
2018/1 - 2022/5 Principal Supervisor	Amine Arfaoui (Completed) , Concordia University Thesis/Project Title: Visible Light Communications, security, modeling Present Position: Interdigital
2018/1 - 2021/1 Principal Supervisor	Moataz Shokry (Completed) , Concordia University Thesis/Project Title: UAVs, next generation networks, vehicular networks, 5G. Present Position: RBC
2018/1 - 2021/5 Principal Supervisor	Ahmed Mahdi (Completed) , Concordia University Thesis/Project Title: VANET, Intelligent transportation Systems Present Position: Software engineer, Amazon
2017/9 - 2022/4 Principal Supervisor	Ali Sayed (Completed) , concordia University Thesis/Project Title: Edge computing, RIS Present Position: Principal Engineer, TATA- NJ
2017/9 - 2021/8 Principal Supervisor	Ibrahim Sorkhoh (Completed) , Concordia University Thesis/Project Title: 5G networks, Vehicular cloud networks, edge computing Present Position: PDF, McGill + Ericsson
2017/5 - 2021/5 Principal Supervisor	Ekram Kabeer (Completed) , Concordia University Thesis/Project Title: Electric Vehicles, Scheduling, Machine Learning Present Position: Postdoc, Ericsson
2017/1 - 2020/8 Principal Supervisor	Elie Haber (Completed) , Concordia University Thesis/Project Title: Clouds, Mobile Edge Computing, Offloading, Cellular Present Position: PDF, Dalhousie University
2016/8 - 2021/2 Principal Supervisor	Sadegh Torabi (Completed) , Concordia University Thesis/Project Title: Security, Internet Of Things, Darknet data analysis Present Position: Assistant Prof., George Mason University
2016/1 - 2019/8 Principal Supervisor	Mohaned Chraiti (Completed) , Concordia University Thesis/Project Title: Physical Layer Security, wireless communications, NOMA access Present Position: Assistant Professor, Turkey - sabanci univ
2015/5 - 2018/10 Co-Supervisor	Tri Nguyen (Completed) , Ecole de Technology Superieur, ETS Thesis/Project Title: 5G, wireless backhaul, green networks, energy efficiency. Present Position: Senior Engineer, Canada Railway

2015/1 - 2018/10 Principal Supervisor	Hyame Alameddine (Completed) , Concordia University Thesis/Project Title: Network Function Virtualization, Bandwidth Guarantees, SDN, Data Centers. Present Position: Principal Engineer, Ericsson Montreal
2014/1 - 2018/10 Principal Supervisor	Bassam Moussa (Completed) , Concordia University Thesis/Project Title: Security in Smart grids. Present Position: Principal Engineer, Hydro Quebec
2013/9 - 2018/10 Principal Supervisor	Reem Kateb (Completed) , Concordia University Thesis/Project Title: survivable virtual network embedding Present Position: Assistant Professor, Saudi Arabia

Post-doctorate [n=2]

2017/9 - 2019/8 Co-Supervisor	Dariush Ebrahimi (Completed) , Waterloo Thesis/Project Title: Data collection, UAVs, IoT. Present Position: Assistant Professor, Laurier University
2015/5 - 2017/4 Principal Supervisor	Elmahdi Driouch (Completed) , Concordia University Thesis/Project Title: Power control in heterogeneous cellular networks Present Position: Assistant Professor, Université de Moncton

Event Administration

2024/4 - 2024/4	General Chair, IEEE DRCN 2024, Conference, 2024/4 - 2024/4
2021/5 - 2021/5	Program Chair, IEEE ICC 2021 - Optical Networks Symposium, Conference, 2021/5 - 2021/5
2018/6 - 2018/6	Technical Program Chair, IEEE Conference on Network Softwarization, Conference, 2018/6 - 2018/6
2017/12 - 2017/12	Technical Program Chair, IEEE Globecom 2017, Mobile and Wireless Networks Symposium, Conference, 2017/12 - 2017/12
2017/6 - 2017/6	Technical Program Chair, IEEE Cloudnet 2017, Conference, 2017/6 - 2017/6

Editorial Activities

2012/5 - 2025/5	Associate Editor, IEEE Transactions on Vehicular Technologies, Journal
2017/4 - 2025/4	Associate Editor, IEEE Transactions on Mobile Computing, Journal
2006/3 - 2025/3	Associate Editor, IEEE Communications Surveys and Tutorials, Journal
2013/1 - 2025/1	Associate Editor, IEEE Transactions on communications, Journal
2018/9 - 2022/8	Associate Editor, IEEE Transactions on Networks and Service Management, Journal
2009/9 - 2018/5	Associate Editor, Computer Networks, ELSEVIER, Journal

Organizational Review Activities

2014/1 - 2021/7	Reviewer, king fahd university of petroleum and minerals Frequent review of research proposals for their research office. On average I review 1-2 proposals per year.
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2014/1 - 2021/7	Reviewer, NSERC Reviewer for NSERC research proposals (Discovery Grant Program).
2014/1 - 2021/1	Reviewer, Kuwait University Expert review of research proposals for their research office.

Committee Memberships

2018/9	Committee Member, Faculty Research Committee, Concordia University
2018/5	Committee Member, Faculty Promotion and Tenure Committee, Concordia University
2018/3	Co-chair, IEEE WCNC, IEEE
2015/5	Committee Member, Graduate Price Committee, Concordia University, ENCS, Concordia University The committee meets and review applications for awards allocated to new students as well as existing students.
2015/5	Committee Member, Faculty Research Committee, Faculty of engineering and computer science., Concordia University This committee evaluated applications from faculty members for internal awards as well as university research chairs, midterm reviews, etc.
2015/5	Committee Member, Department Tenure Committee, Concordia University Review and recommend tenure for faculty members in the CIISE department.
2014/5	Committee Member, Graduate Curriculum Committee and Council of the School of Graduate Studies, Concordia University Evaluation of new curriculum, courses proposals, research related issues, graduate student supervision, etc.
2012/9	Committee Member, COOP institute, Concordia University, Concordia University
2012/5	Committee Member, IEEE Globecom, IEEE ICC, IEEE WCNC, IEEE VTC, IEEE Cloudnet, IEEE Netsoft, IEEE WIMOB, and various IEEE Conferences, IEEE
2021/1 - 2021/12	Co-chair, IEEE International Conference on Communications (ICC), IEEE
2018/5 - 2021/5	Committee Member, Graduate Studies Curriculum Committee, Concordia University

Other Memberships

2020/10	IEEE Fellow, IEEE
2015/9	Professional Engineer, Professional Engineering Ontario

Presentations

- (2023). Safeguarding the EV Ecosystem. Seminar series at Khalifa University, Abu Dhabi, United Arab Emirates
Main Audience: Researcher
Invited?: Yes, Keynote?: No

2. (2023). Safeguarding the EV Ecosystem: reliable and secure ecosystem for the charging needs of EVs and achieving a sustainable transportation sector. The 14th IEEE International Conference on Power Electronics and Drive Systems <https://ieee-peds.org>, Montreal, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
3. (2023). Ensuring a Resilient and Secure EV Charging Infrastructure for Sustainable Transportation. The 8th International Conference on Information and Communication Technologies for Disaster Management (ICT-DM), Cosenza, Italy
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
4. (2021). Non-Orthogonal Multiple Access for Massive Connectivity in Future Cellular Networks. The 10th IFIP/IEEE International Conference on Performance Evaluation and Modeling in Wired and Wireless Networks, Waterloo, Canada
Invited?: Yes, Keynote?: Yes
5. (2021). Non-Orthogonal Multiple Access for Massive Connectivity in Future Cellular Networks. IEEE Latin-American Conference on Communications (LATINCOM), Santo Domingo, Dominican Republic
Invited?: Yes, Keynote?: Yes
6. (2020). Opportunities, Challenges and Layered Architecture of VLC Systems: Towards a Practical Design for LiFi Networks. IEEE International conference on Wireless Communications & Mobile Computing, ICWCMC, Limassol, Cyprus
Invited?: Yes, Keynote?: Yes
7. (2019). (Reliable) Service Chaining in Softwarized Networks. Invited Seminar at Huawei Montreal, Montreal, Canada
Invited?: Yes, Keynote?: No
8. (2019). Edge Computing Empowering IoT-Services for Smart Cities. IEEE ACTEA, Beirut, Lebanon
Invited?: Yes, Keynote?: Yes
9. (2018). Unmanned Aerial Vehicles: Applications, Research Challenges and Future Directions. Invited seminar at University of CAUCA, Popayan, Colombia
Main Audience: General Public
Invited?: Yes, Keynote?: Yes
10. (2018). Multi Access Edge Computing. Seminar series, Popayan, Colombia
Invited?: Yes, Keynote?: No
11. (2018). Trends and Issues in Network Softwarization. Seminar series, Popayan, Colombia
Invited?: Yes, Keynote?: No
12. (2018). Internet of Things and Smart cities. Invited seminar at University of Paris, Est., Paris, France
Main Audience: Researcher
Invited?: Yes, Keynote?: No

Broadcast Interviews

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|----------------------------|--|
| 2023/09/27 -
2023/09/27 | Cybersecurity in EVs and modern vehicles, discussing risks and challenges with EVs in terms of privacy and cybersecurity, and how consumers could be more responsible., The Canadian Press, The Canadian Press |
| 2022/11/04 -
2022/11/04 | EV Charging Ecosystem cybersecurity, Radio Canada, Radio Canada |
| 2022/04/04 -
2022/04/04 | Des failles de cybersécurité dans les bornes de recharge de véhicules électriques, Société, Le Devoir |

Publications

Journal Articles

1. Nathalie Wehbeh, Hyame Alameddine, Makan Pourzandi, Elias Bou-Harb, Chadi Assi. (2023). A Security Assessment of HTTP/2 Usage in 5G Service Based Architecture. IEEE communications magazine. Published
Refereed?: Yes
2. Ahmad Al-Hilo, Moataz Shokry, Mohamad El Hattab, Chadi Assi, Sanaa Sharafeddine. (2023). RIS-Assisted UAV for Timely Data Collection in IoT Networks. IEEE Systems Journal. Published
Refereed?: Yes, Open Access?: No
3. Khaled Sarieeddine, Mohammad Ali Sayed, Sadegh Torabi, Ribal Atallah, and Chadi Assi. (2023). Edge-Based Detection and Localization of Adversarial Oscillatory Load Attacks Orchestrated By Compromised EV Charging Stations. International Journal of Electrical Power and Energy Systems. Accepted
Refereed?: Yes, Open Access?: No
4. Khaled Sarieeddine, Mohamad Sayed, Danial Jafarigiv, Ribal Atallah, Mourad Debbabi, Chadi Assi. (2023). A Real-Time Cosimulation Testbed for Electric Vehicle Charging and Smart Grid Security. IEEE Security & Privacy. Accepted
Refereed?: Yes, Open Access?: No
5. W Lyu, Y Xiu, Y Zhao, C Assi, Z Zhang. (2023). Age Minimization in Outdoor and Indoor Communications with Relay-aided Dual RIS. IEEE Communications Letters. Accepted
Refereed?: Yes, Open Access?: No
6. Shreya Khisa, Mohamad El Hattab, Chadi Assi, Sanaa Sharafeddine. (2023). Energy Consumption Optimization in RIS-Assisted Cooperative RSMA Cellular Networks. IEEE Transactions on Communications. Accepted
Refereed?: Yes, Open Access?: No
7. Ali Syed Muhammad, Mohamad El Hattabv, Mohamad Amine Arfaoui, Chadi Assi. (2023). Optimizing Information Freshness in RIS-assisted Non-Orthogonal Multiple Access-based IoT Networks. IEEE Networking Letters. Accepted
Refereed?: Yes, Open Access?: No
8. Salwa Razaulla, Claude Fachkha, Christine Markarian, Amjad Gawanmeh, Wathiq Mansoor, Benjamin CM Fung, Chadi Assi. (2023). The Age of Ransomware: A Survey on the Evolution, Taxonomy, and Research Directions. IEEE Access. Accepted
Refereed?: Yes, Open Access?: Yes
9. Khaled Sarieeddine, Mohammad Ali Sayed, Sadegh Torabi, Ribal Atallah, and Chadi Assi. (2023). Investigating the Security of EV Charging Mobile Applications As an Attack Surface. ACM Transactions on Cyber-Physical Systems. Accepted
Refereed?: Yes, Open Access?: No

10. Mohamad Almekhlafi, Mohamad Amine Arfaoui, Chadi Assi, Ali Ghrayeb. (2023). A Low Complexity Passive Beamforming Design for Reconfigurable Intelligent Surface (RIS) in 6G Networks. IEEE Transactions on Vehicular Technology.
Accepted
Refereed?: Yes, Open Access?: No
11. A. Al Hilo, M. Shorky, M. El Hattab, C. Assi, S. Sharafeddine,. (2022). Reconfigurable Intelligent Surface Enabled Vehicular Communication: Joint User Scheduling and Passive Beamforming. IEEE Transactions on Vehicular Technology.
Published
Refereed?: Yes, Open Access?: No
12. Ahmadreza Abazari Mohsen Ghafouri, Masoud Zasdard, Ribal Atallah and Chadi Assi. (2022). A Data Mining/ANFIS and Adaptive Control for Detection and Mitigation of Attacks on DC MGs. IEEE Transactions on Smart Grids.
Accepted
Refereed?: Yes
13. Mohamad El Hattab, M Amine Arfaoui, Chadi Assi, Ali Ghrayeb. (2022). RIS-Assisted Joint Transmission in a Two-Cell Downlink NOMA Cellular System. IEEE Journal on Selected Areas in Communications, JSAC.
Published
Refereed?: Yes, Open Access?: No
14. Shreya Khisa, Mohamad Hamood, Mohamad El Hattab, Chadi Assi. (2022). Full Duplex Cooperative Rate Splitting Multiple Access for a MISO Broadcast Channel with two Users. IEEE Communications Letters.
Published
Refereed?: Yes
15. MA Sayed, R Atallah, C Assi, M Debbabi. (2022). Electric vehicle attack impact on power grid operation. International Journal of Electrical Power & Energy Systems.
Published
Refereed?: Yes, Open Access?: No
16. Mohamad El-Hattab, Amine Arfaoui, Chadi Assi, Ali Ghrayeb, Marwa Qarake. (2022). On Optimizing the Power Allocation and Decoding Order in UL C-NOMA. IEEE Communications Letters.
Accepted
Refereed?: Yes
17. Shirin Rezasoltani; Leszek Szczecinski; Chadi Assi. (2022). Semantic Metrics for Non Real-Time Applications. IEEE Transactions on Communications.
Published
Refereed?: Yes, Open Access?: No
18. MA Arfaoui, A Ghrayeb, C Assi, M Qarake. (2022). CoMP-Assisted NOMA and Cooperative NOMA in Indoor VLC Cellular Systems. IEEE Transactions on Communications.
Published
Refereed?: Yes, Open Access?: No
19. M Almekhlafi, MA Arfaoui, C Assi, A Ghrayeb. (2022). Superposition-Based URLLC Traffic Scheduling in 5G and Beyond Wireless Networks. IEEE Transactions on Communications.,
Published
Refereed?: Yes, Open Access?: No
20. T Nasr, S Torabi, E Bou-Harb, C Fachkha, C Assi. (2022). Power jacking your station: In-depth security analysis of electric vehicle charging station management systems. Computers & Security.
Published
Refereed?: Yes, Open Access?: No

21. Elie Haber, Hyame Alameddine, Sanaa Sharafeddine, Chadi Assi. (2021). UAV-aided Ultra-Reliable Low-Latency Computation Offloading in Future IoT Networks. IEEE Transactions on Communications.
Accepted
Refereed?: Yes
22. Muhammad, Ali; Sorkhoh, Ibrahim; Shoukry, Moataz; Ebrahimi , Dariush ; Assi, Chadi. (2021). Minimizing Age of Information in Multi-Access Edge Computing-assisted IoT Networks. IEEE IoT Journal.
Published
Refereed?: Yes, Open Access?: No
23. Maurice Khabbaz, Chadi Assi, Sanaa Sharafeddine. (2021). Multi-Hop V2U Path Availability Analysis in UAV-Assisted Vehicular Networks. IEEE Internet of Things Journal. Volume: 8(Issue: 13)
Published
Refereed?: Yes
24. M. Kadry, A. Arfaoui, C. Assi, A. Ghrayeb,. (2021). Reconfigurable Intelligent Surface Assisted Coordinated Multipoint in Downlink NOMA Networks. IEEE Communications Letters.
Published
Refereed?: Yes
25. Moataz Shokry, Mohamed Kadry, Chadi Assi, Sanaa Sharafeddine, Ali Ghrayeb. (2021). Optimizing Age of Information Through Aerial Reconfigurable Intelligent Surfaces: A Deep Reinforcement Learning Approach. IEEE Transactions on Vehicular Technology.
Published
Refereed?: Yes
26. Ahmad Al-Hilo, Dariush Ebrahimi, Sanaa Sharafeddine, Chadi Assi. (2021). Vehicle-Assisted RSU Caching Using Deep Reinforcement Learning. IEEE Transactions on Emerging Topics in Computing.
Published
Refereed?: Yes
27. M Almekhlafi, MA Arfaoui, M Elhattab, C Assi, A Ghrayeb. (2021). Joint Resource Allocation and Phase Shift Optimization for RIS-Aided eMBB/URLLC Traffic Multiplexing. IEEE Transactions on Communications.
Published
Refereed?: Yes
28. Shirin Rezasoltani, Chadi Assi. (2021). Real Time Status Updates in Wireless HARQ with Imperfect Feedback Channel. IEEE Transactions on Wireless Communications.
Published
Refereed?: Yes, Open Access?: No
29. Mohammad Hamood, Mohaned Chraiti, Amine Arfaoui, Chadi Assi, Ali Ghrayeb, Amira Alloum. (2021). A Downlink Puncturing Scheme for Simultaneous Transmission of URLLC and eMBB Traffic by Exploiting Data Similarity. IEEE Transactions on Vehicular Technology.
Published
Refereed?: Yes, Open Access?: No
30. M Ghafouri, U Karaagac, A Ameli, J Yan, C Assi. (2021). A Cyber Attack Mitigation Scheme for Series Compensated DFIG-Based Wind Parks. IEEE Transactions on Smart Grid.
Published
Refereed?: Yes, Open Access?: No
31. Ahmed Mahdi, Dariush Ebrahimi, Sanaa Sharafeddine, Chadi Assi. (2021). A Cooperative Approach for Content Caching and Delivery in UAV-Assisted Vehicular Networks. Vehicular Communications, Elsevier.
Published
Refereed?: Yes, Open Access?: No

32. Ibrahim Sorkhoh, Chadi Assi, Dariush Ebrahimi, Sanaa Sharafeddine. (2021). Optimizing Information Freshness for MEC-enabled Cooperative Autonomous Driving. IEEE Transactions on Intelligent Transportation.
Published
Refereed?: Yes
33. ME Kabir, M Ghafouri, B Moussa, C Assi. (2021). A Two-Stage Protection Method for Detection and Mitigation of Coordinated EVSE Switching Attacks. IEEE Transactions on Smart Grid.
Published
Refereed?: Yes, Open Access?: No
34. M. Amine Arfaoui, Mohammad Dehghani Soltani, Iman Tavakkolnia, Ali Ghrayeb, Chadi Assi, Majid Safari, and Harald Haas. (2021). Invoking Deep Learning for Joint Estimation of Indoor LiFi User Position and Orientation. IEEE Journal of Selected Areas on Communications, Accepted 2021.
Published
Refereed?: Yes, Open Access?: No
35. Mirabelle Dib, Ssadeq Torabi, Elias Bou-Harb, Chadi Assi. (2021). A multi-dimensional deep learning framework for IoT malware classification and family attribution. IEEE Transactions on Network and Service Management.
Published
Refereed?: Yes, Open Access?: No
36. S Torabi, M Dib, E Bou-Harb, C Assi, M Debbabi. (2021). A Strings-Based Similarity Analysis Approach for Characterizing IoT Malware and Inferring Their Underlying Relationships. IEEE Networking Letters.
Published
Refereed?: Yes, Open Access?: No
37. Elie Haber, Mohamad Kadry, Sanaa Sharafeddine, Chadi Assi. (2021). Latency and Reliability Aware Edge Computation Offloading via an Intelligent Reflecting Surface. IEEE Communications Letters.
Accepted
Refereed?: Yes
38. S Torabi, M Dib, E Bou-Harb, C Assi, M Debbabi. (2021). A Strings-Based Similarity Analysis Approach for Characterizing IoT Malware and Inferring Their Underlying Relationships. IEEE Networking Letters.
Published
Refereed?: Yes
39. M. Kadry, A. Arfaoui, C. Assi. (2021). Power Allocation in CoMP-empowered C-NOMA Networks. IEEE Networking Letters.
Published
Refereed?: Yes
40. Ali Muhammad, Ibrahim Sorkhoh, Long Qu, and Chadi Assi. (2021). Delay-Sensitive Multi-Source Multicast Resource Optimization in NFV-Enabled Networks: A Column Generation Approach. IEEE Transactions on Network and Service Management.
Published
Refereed?: Yes
41. Ekram Kabeer, Ibrahim Sorkhoh, Bassam Moussa, Chadi Assi. (2021). Joint Routing and Scheduling of Mobile Charging Infrastructure for V2V Energy Transfer. IEEE Transactions on Intelligent Vehicles.
Published
Refereed?: Yes
42. Joseph Antoun, Ekram Kabir, Ribal Atallah, Chadi Assi. (2021). A Data Driven Performance Analysis Approach for Enhancing the QoS of Public Charging Stations. IEEE Transactions on Intelligent Transportation Systems.
Published
Refereed?: Yes, Open Access?: No

43. H. El Husseini, C. Assi, B Moussa, R. Atallah, A. Ghryayeb. (2021). A Tale of Two Entities Contextualizing Electric Vehicle Charging Stations Cyber-Fingerprint on the Power Grid. ACM Transactions on Internet of Things.
Published
Refereed?: Yes
44. Al-Hilo, Ahmed; Samir, Moataz; Assi, Chadi; Sharafeddine, Sanaa; Ebrahimi, Dariush. (2020). UAV-assisted Content Delivery in Intelligent Transportation Systems - Joint Trajectory Planning and Cache Management. IEEE Transactions on Intelligent Transportation Systems.
Published
Refereed?: Yes
45. Maurice Khabbaz, Joseph Antoun, Sanaa Shafaeddine, Chadi Assi. (2020). Modelling and Delay Analysis of Intermittent V2U Communication In Secluded Areas. IEEE Transactions on Wireless Communications.
Published
Refereed?: Yes
46. Morteza Safaei Pour ; Sadegh Torabi ; Elias Bou-Harb ; Chadi Assi ; Mourad Debbabi “. (2020). Stochastic Modeling, Analysis and Investigation of IoT-Generated Internet Scanning Activities. IEEE Networking Letters.
Published
Refereed?: Yes
47. Phuc Dinh, Mohamed-Amine Arfaoui , Chadi Assi and Ali Ghryayeb. (2020). Exploiting Antenna Diversity to Enhance Hybrid Cooperative Non-Orthogonal Multiple Access. IEEE Communications Letters.
Published
Refereed?: Yes
48. M. Shokry, C. Assi, S. Sharafeddine, A. Ghryayeb. (2020). Online Altitude Control and Scheduling Policy for Minimizing Aol in UAV-assisted IoT Wireless Networks. IEEE Transactions on Mobile Computing.
Published
Refereed?: Yes
49. Ekram Kabir, Chadi Assi, Joseph Antoun, Hyame Alameddine, Jun Yan. (2020). Demand-Aware Provisioning of Electric Vehicles Fast Charging Infrastructure. IEEE Transactions on Vehicular Technology.
Published
Refereed?: Yes
50. Moataz Shokry, Chadi Assi, Sanaa Sharafeddine, Dariush Ebrahim, Ali Ghryayeb. (2020). Age of Information Aware Trajectory Planning of UAVs in Intelligent Transportation Systems: A Deep Learning Approach. IEEE Transactions on Vehicular Technology.
Published
Refereed?: Yes
51. Mohamed Amine Arfaoui, Mohammad Dehghani Soltani, Iman Tavakkolnia, Ali Ghryayeb, Chadi Assi, Majid Safari, and Harald Haas,. (2020). Measurements-Based Channel Models for Indoor LiFi Systems. IEEE Transactions on Wireless Communications.
Published
Refereed?: Yes
52. M. Kadry, A. Arfaoui, C. Assi. (2020). CoMP Transmission in Downlink NOMA-based Heterogeneous Cloud Radio Access Networks. IEEE Transactions on communications.
Published
Refereed?: Yes
53. M. Kadry, A. Arfaoui, C. Assi. (2020). A Joint CoMP C-NOMA for Enhanced Cellular System Performance. IEEE Communication Letters.
Published
Refereed?: Yes

54. Long Qu, Chadi Assi. (2020). Reliability-Aware Multi-Source Multicast Hybrid Routing in Softwarized Networks. IEEE Access.
Published
Refereed?: Yes
55. Phúc Huu, Mohamed-Amine Arfaoui, Sanaa Sharafeddine, Chadi M. Assi and Ali Ghrayeb. (2020). A Low-Complexity Framework for Joint User Pairing and Power Control for Cooperative NOMA in 5G and Beyond Cellular Networks. IEEE Transactions on communications,.
Published
Refereed?: Yes
56. Mohsen Ghafouri, Minh Au, Marthe Kassouf, Mourad Debbabi, Chadi Assi, and Jun Yan. (2020). Detection and Mitigation of Cyber Attacks on Voltage Stability Monitoring of Smart Grids. IEEE Transactions on Smart Grids.
Published
Refereed?: Yes
57. Torabi, Sadegh; Bou-Harb, Elias; Assi, Chadi; Boukhtouta, Amine; Debbabi, Mourad. (2018). Investigating Internet-Scale Reconnaissance Activities by Compromised IoT Devices Through The Lens of A Large-Scale Network Telescope. IEEE Transactions on Dependable and Secure Computing.
Submitted
Refereed?: Yes
58. B. Moussa, M. Kassouf, M. Debbabi, C. Assi. (2018). Exploiting The Vulnerability of Relative Data Alignment in Phasor Data Concentrators to Time Synchronization Attacks. IEEE Transactions on Smart Grids.
Revision Requested
Refereed?: Yes
59. Reem Kateb, Parisa Akaber, M. Tushar, M. Debbabi, C. Assi,. (2018). Enhancing the Observability of WAMS Communication Network Against Delay Attacks. IEEE Transactions on Smart Grid.
Accepted
Refereed?: Yes
60. Amine Arfaoui, Ali Ghrayeb, Chadi Assi. (2018). Secrecy Performance of Multi-User MISO VLC Broadcast Channels With ConfidentialMessages. IEEE Transactions on Wireless Communications.
Accepted
Refereed?: Yes
61. Tri Nguyen, Wessam Ajib, Chadi Assi,. (2018). ANovel Cooperative NOMA For Designing UAV-Assisted Wireless Backhaul Networks. IEEE Journal of Selected Areas on Communications.
Accepted
Refereed?: Yes
62. Tri Nguyen, Wessam Ajib, Chadi Assi. (2018). A Novel Cooperative Non-Orthogonal Multiple Access (NOMA) in Wireless BackhaulTwo-Tier HetNets. IEEE Transactions on Wireless Communications.
Published
Refereed?: Yes
63. Dariush Ebrahimi, Sanaa Sharafeddine, Pin-Han Ho, Chadi Assi. (2018). UAV-Aided Projection-Based CompressiveData Gathering in Wireless Sensor Networks. EEE Internet of Things Journal.
Revision Requested
Refereed?: Yes
64. M. Khabbaz, J. Antoun, C. Assi. (2018). Modelling and Performance Analysis of UAV-Assisted Vehicular Networks. IEEE Transactions on Intelligent Transportation Systems.
Submitted
Refereed?: Yes

65. Tri Nguyen, Wessam Ajib, Chadi Assi. (2018). Designing Wireless Backhaul Heterogeneous Networks with Small Cell Buffering. IEEE Transactions on Communications.
Published
Refereed?: Yes
66. Chadi Assi, Sara Ayoubi, Nicolas El-Khoury, Long Qu. (2018). Energy-Aware Placement And Scheduling of Network Traffic Flows with Deadlines on Virtual Network Functions. IEEE Transactions on Green Communications and Networking.
Accepted
Refereed?: Yes
67. Hyame Alameddine, M. Tushar, Chadi Assi. (2018). Scheduling of Low Latency Services in Softwarized Networks. IEEE Journal on selected areas in communications.
Revision Requested
Refereed?: Yes
68. Bassam Moussa, Marthe Kassouf, Rachid Hadjij, Mourad Debbabi, Chadi Assi. (2018). An Extension to the Precision Time Protocol (PTP) to Enable the Detection of CyberAttacks. IEEE Transactions on Industrial Informatics.
Revision Requested
Refereed?: Yes
69. M. Amine Arfaoui, Ali Ghayeb, Chadi Assi. (2018). Secrecy Rate Closed-form Expressions for the SISO VLC Wiretap Channel with Discrete Input Signalling. IEEE Communications Letters.
Published
Refereed?: Yes
70. Mosaddek Tushar, Chadi Assi, Adel Zeineddine. (2018). Demand-Side Management by Regulating Charging and Discharging of the EV, ESS, and Utilizing Renewable Energy. IEEE Transactions on Industrial Informatics. 14(1)
Published
Refereed?: Yes
71. Mohaned Chraiti, Ali Ghayeb, Chadi Assi. (2018). A Spectral-efficient Uplink Transmission Scheme Exploiting Similarity Among Short Bit Sequences. IEEE Transactions on Communications.
Submitted
Refereed?: Yes
72. Mohaned Chraiti, Ali Ghayeb, Chadi Assi. (2018). A NOMA Scheme Exploiting Partial Similarity Among Users Bit Sequences. IEEE Transactions on Communications.
Published
Refereed?: Yes
73. Mohaned Chraiti, Ali Ghayeb, Chadi Assi, Nizar Bouguila and Reinaldo A. Valenzuela. (2018). A Framework for Unsupervised UAV-BSs based Cellular System Planning Using Statistical Machine Learning. IEEE Journal of Selected Areas on Communications.
Submitted
Refereed?: Yes
74. Elias Bou-Harb, Chadi Assi, Mourad Debbabi. (2018). CSC-Detector: A System to Infer Large-Scale Probing Campaigns. IEEE Transactions on Dependable and Secure Computing. 15(3)
Published
Refereed?: Yes
75. Mohaned Chraiti, Ali Ghayeb, Chadi Assi. (2018). A NOMA Scheme for a Two-user MISO Downlink Channel with Unknown CSIT. IEEE Transactions on Wireless Communications.
Accepted
Refereed?: Yes

76. Bassam Moussa, Parisa Akaber, Mourad Debbabi, Chadi Assi. (2018). Critical Links Identification for Selective Outages in Interdependent Power-Communication Networks. *IEEE Transactions on Industrial Informatics*. 14(2)
Published
Refereed?: Yes
77. Maurice Khabbaz, Chadi Assi. (2018). Modelling and Analysis of A Novel Deadline-Aware Scheduling Scheme For Cloud Computing Data Centers. *IEEE Transactions on Cloud Computing*. 6(1)
Published
Refereed?: Yes
78. Tri Nguyen, Wessam Ajib, Chadi Assi. (2018). Improving Wireless Backhaul Heterogeneous Networks Performance with Small Cell Buffering. *IEEE Transactions on Communications*.
Published
Refereed?: Yes
79. Wissam Fawaz, Chadi Abou-Rjeily, Chadi Assi. (2018). UAV-Aided Cooperation for FSO Communication Systems. *IEEE Communications Magazine*. 56(1)
Published
Refereed?: Yes
80. M. Shokry, S. Sharafeddine, C. Assi, A. Ghayeb. (2018). UAV Trajectory Planning for Data Collection from Time-Constrained IoT Devices,. *IEEE Transactions on Wireless Communications*.
Submitted
Refereed?: Yes
81. Parisa Akaber, Bassam Moussa, Mourad Debbabi, Chadi Assi. (2018). Automated Post-Failure Service Restoration in Smart Grid Through Network Reconfiguration in the Presence of Energy Storage Systems. *IEEE Systems Journal*.
Revision Requested
Refereed?: Yes
82. Elie Haber, Tri Nguyen, Chadi Assi. (2018). Computational Cost and Energy Efficient Task Offloading in Hierarchical Edge-Clouds. *IEEE Transactions on Communications*.
Revision Requested
Refereed?: Yes
83. H. Alameddine, S. Sharafeddine, S. Sebbah, S. Ayoubi, C. Assi. (2018). *Dynamic Task Offloading and Scheduling for Low-Latency IoT Services in Multi-Access Edge Computing*. *IEEE Journal on Selected Areas in Communications*.
Submitted
Refereed?: Yes
84. Ibrahim Sorkhoh, Chadi Assi, Dariush Ebrahimi, Ribal Atallah. (2018). Workload Scheduling in Vehicular Networks with Edge Cloud Capabilities. *IEEE Transactions on Vehicular Technology*.
Revision Requested
Refereed?: Yes
85. R. Atallah, C. Assi, M. Khabbaz. (2018). Scheduling the operation of a connected vehicular network using deep reinforcement learning. *IEEE Transactions on Intelligent Transportation Systems*.
Published
Refereed?: Yes
86. MH Rehmani, A Davy, B Jennings, C Assi. (2018). Software Defined Networks based Smart Grid Communication: A Comprehensive Survey. *IEEE Communications Surveys & Tutorials*.
Submitted
Refereed?: Yes

87. Mohaned Chraiti, Ali Ghrayeb, Chadi Assi, Mazen Hasna. (2018). On the Achievable Secrecy Diversity of Cooperative Networks with Untrusted Relays. IEEE Transactions on Communications. 66(1)
Published
Refereed?: Yes
88. Ekram Kabeer, Chadi Assi, Mosaddek Tushar, Jun Yan. (2018). Optimal Scheduling of EV Charging at a Solar Power Based Charging Station. IEEE Transactions on Intelligent Transportation Systems.
Submitted
Refereed?: Yes
89. N. Kherraf, H. Alameddine, S. Sharafeddine, A. Ghrayeb, C. Assi. (2018). Optimized Provisioning of Edge Computing Resources with Heterogeneous Workload in IoT Networks. IEEE Transactions on Network and Service Management.
Revision Requested
Refereed?: Yes
90. Mohaned Chraiti, Ali Ghrayeb, Chadi Assi. (2018). Nonlinear Interference Alignment in a One-dimensional Space. IEEE Transactions on Wireless Communications.
Accepted
Refereed?: Yes
91. Reem Kateb, M Tushar, C Assi, M. Debbabi,. (2018). Optimal Tree Construction Model for Cyber-Attacks to Wide Area Measurement Systems. IEEE Transactions on Smart Grids. 9(1)
Published
Refereed?: Yes
92. B. Moussa, C. Robitaille, M. Kassouf, M. Debbabi, C. Assi. (2018). Securing The Precision Time Protocol (PTP) Against Fake Timestamps. IEEE Comm Letters.
Accepted
Refereed?: Yes
93. Parisa Akaber, Mourad Debbabi, Chadi Assi. (2018). CAsEs:Concurrent Contingency Analysis-based Security Metric Deployment for the SmartGrid. IEEE Transactions on Industrial Informatics.
Submitted
Refereed?: Yes
94. S Torabi, A Boukhtouta, C Assi, M Debbabi. (2018). Detecting Internet Abuse by Analyzing Passive DNS Traffic: A Survey of Implemented Systems. IEEE Communications Surveys & Tutorials.
Accepted
Refereed?: Yes
95. Ribal Atallah, Chadi Assi, Wissam Fawwaz, M. Tushar, M. Khabbaz. (2018). Optimal Supercharge Scheduling of Electric Vehicles:Centralized vs. Decentralized Methods. IEEE Transactions on Vehicular Technology.
Published
Refereed?: Yes
96. Long Qu, M. Khabbaz. C Assi. (2018). Reliability-AwareService Chaining In Carrier-Grade Softwarized Networks. IEEE Journal of Selected Areas on Communications. 36(3)
Published
Refereed?: Yes
97. Mosaddek Hossain Kamal, Chadi Assi. (2017). Volt-VARControl through Joint Optimization of Capacitor Bank Switching, RenewableEnergy, and Home Appliances. IEEE Transactions on Smart Grids.
Published
Refereed?: Yes

98. Mohaned Chraiti, Ali Ghrayeb, Chadi Assi. (2017). Achieving Full Secure Degrees-of-Freedom for the MISO Wiretap Channel with an Unknown Eavesdropper. *IEEE Transactions on Wireless Communications*. 16(11)
Published
Refereed?: Yes
99. Hyame Alameddine, Sara Ayoubi, Chadi Assi. (2017). An Efficient Survivable Design with Bandwidth Guarantees for Multi-tenant Cloud Networks. *IEEE Transactions on Network and Service Management*. 14(2)
Published
Refereed?: Yes
100. L. Qu, C. Assi, K. Shaban, M. Khabbaz. (2017). A Reliability-Aware Network Service Chain Provisioning with Delay Guarantees in NFV-Enabled Enterprise Datacenter Networks. *IEEE Transactions on Network and Service Management*. 14(3)
Published
Refereed?: Yes
101. S. Ayoubi, C. Assi, Y. Chen, K. Shaban, T. Khalifa. (2017). Restoration Methods for Cloud Multicast Virtual Networks. *Journal of Network and Computer Applications*. 78(15)
Published
Refereed?: Yes
102. Mosaddek Tushar, Chadi Assi,. (2017). Optimal Energy Management and Marginal-Cost Electricity Pricing in Microgrid Network. *IEEE Transactions on Industrial Informatics*. 13(6)
Published
Refereed?: Yes
103. W. Fawaz, R. Atallah, C. Assi, M. Khabbaz. (2017). Unmanned Aerial Vehicles as Store-Carry-Forward Nodes for Vehicular Networks. *IEEE Access*.
Published
Refereed?: Yes
104. Sara Ayoubi, Chadi Assi, Samir Sebbah. (2017). A Cut-and-Solve Based Approach for the VNF Assignment Problem. *IEEE Transactions on Cloud Computing*.
Published
Refereed?: Yes
105. Elias Bou-Harb, Mourad Debbabi, Chadi Assi. (2017). Big Data Behavioral Analytics meet Graph Theory: On Effective Botnet Takedowns. *IEEE Network*. 31(1)
Published
Refereed?: Yes
106. Ribal Atallah, Maurice Khabbaz, Chadi Assi. (2017). Multi-hop Vehicle-to-Infrastructure Communications: A Feasibility Study, Modelling and Performance Analysis. *IEEE Transactions on Vehicular Technology*. 66(3)
Published
Refereed?: Yes
107. Ribal Atallah, Chadi Assi, Jia Yu. (2017). A Reinforcement Learning Technique for Optimizing Downlink Scheduling in an Energy-Limited Vehicular Network. *IEEE Transactions on Vehicular Technology*. 66(6)
Published
Refereed?: Yes
108. Elias Bou-Harb, Martin Husák, Mourad Debbabi, Chadi Assi. (2017). Big Data Sanitization and Cyber Situational Awareness: A Network Telescope Perspective. *IEEE Transactions on Big Data*.
Published
Refereed?: Yes

109. Elmahdi Driouch, Wessam Ajib, Chadi Assi,. (2017). Power Control and Clustering in Heterogeneous Cellular Networks. Springer, Wireless Networks. 23(8)
Published
Refereed?: Yes
110. Tri Nguyen, Animesh Yadav, Wessam Ajib, Chadi Assi. (2017). Centralized and Distributed Energy Efficiency Designs in Wireless Backhaul HetNets. IEEE Transactions on Wireless Communications. 16(7)
Published
Refereed?: Yes
111. Maurice Khabbaz, Chadi Assi, Khaled Shaban,. (2017). Delay-SensitiveFlow Scheduling In Low Latency Enterprise Datacenter Networks: Modelling andPerformance Analysis. IEEE Transactions on Communications.
Published
Refereed?: Yes
112. HA Alameddine, S Sebbah, C Assi. (2017). Onthe Interplay Between Network Function Mapping and Scheduling in VNF-BasedNetworks: A Column Generation Approach. IEEE Transactions on Network and Service Management. 14(4)
Published
Refereed?: Yes

Journal Issues

1. Massimo Tornatore, Teresa Gomes, Carmen Mas-Machuca, Domique Schupke, Eiji Oki, and Chadi Assi. (2023). Special Issue on Design and Management of Reliable Communication Networks. IEEE Transactions on Networks and Service Management.
In Press
Refereed?: Yes, Open Access?: No
Editors: Massimo Tornatore, Teresa Gomes, Carmen Mas-Machuca, Domique Schupke, Eiji Oki, and Chadi Assi
2. Massimo Tornatore, Teresa Gomes, Carmen Mas-Machuca, Sara Ayoubi, Eiji Oki, and Chadi Assi. (2022). Special Issue on Design and Management of Reliable Communication Networks. IEEE Transactions on Networks and Service Management.
Published
Refereed?: Yes, Open Access?: No
Editors: Massimo Tornatore, Teresa Gomes, Carmen Mas-Machuca, Sara Ayoubi, Eiji Oki, and Chadi Assi

Conference Publications

1. A Amhaz, S Khisa, M El Hattab, C Assi, S Sharafeddine. (2023). Full Duplex UAV-Assisted Rate-Splitting Multiple Access Cellular Networks. IEEE Global Communications Conference, kuala lumpur, Malaysia
Paper
Accepted
Refereed?: Yes, Invited?: No
2. A Amhaz, M El Hattab, C Assi, S Sharafeddine. (2023). Integrated Sensing and Communication: NOMA vs Cooperative NOMA. IEEE Global Communications Conference, Kawala Lumpur, Malaysia
Paper
Published
Refereed?: Yes, Invited?: No

3. Tony Nasr, Sadegh Torabi, Elias Bou-Harb, Claude Fachkha, Chadi Assi. (2023). ChargePrint: A Framework for Internet-Scale Discovery and Security Analysis of EV Charging Management Systems. NDSS'23, San Diego, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
4. R Ayala Molina, S Torabi, E Bou Harb, C Assi. (2023). RPM: Ransomware Prevention and Mitigation Using Operating Systems' Sensing Tactics. IEEE International Conference on Communications, Milano, Italy
Paper
Accepted
Refereed?: Yes, Invited?: No
5. S Khisa, M El Hattab, C Assi, S Sharafeddine. (2023). RIS-Assisted SWIPT-Empowered Cooperative Rate-Splitting Multiple Access for Two Users. IEEE Global Communications Conference, Kuala Lumpur, Malaysia
Paper
Accepted
Refereed?: Yes, Invited?: No
6. R Atallah, N. Aldahabreh, M Sayed, K Sarriddine, M El Hattab, M Khabbaz, C. Assi. (2023). Quality of Service Evaluation and Forecast for EV Charging Based on Real-World Data. IEEE WiMOB, Montreal, Canada
Paper
Published
Refereed?: Yes, Invited?: No
7. Nathalie Wehbe, Hyame Alameddine, Makan Pourzandi, Chadi Assi. (2023). 5GShield: HTTP/2 Anomaly Detection in 5G Service-Based Architecture. IFIP NETWORKING, Barcelona, Spain
Paper
Published
Refereed?: Yes, Invited?: No
8. Ali Muhammad, Mohamed Kadry Elhattab, Mohamed Amine Arfaoui, Chadi Assi. (2022). Optimizing Information Freshness Leveraging Multi-RISs in NOMA-based IoT Networks. IEEE GLOBECOM, Rio Di Janeiro, Brazil
Paper
Published
Refereed?: Yes, Invited?: No
9. Mirabelle Dib, Sadegh Torabi, Elias Bou-Harb, Nizar Bouguila, Chadi Assi. (2022). EVOLIoT: A Self-Supervised Contrastive Learning Framework for Detecting and Characterizing Evolving IoT Malware Variants. ASIA CCS '22: Proceedings of the 2022 ACM on Asia Conference on Computer and Communications Security, Nagasaki, Japan
Paper
Published
Refereed?: Yes, Invited?: No
10. A Abazari, M Ghafouri, R Atallah, C Assi. (2022). Detection and Mitigation Methods of Attacks on Low-inertia Hybrid Microgrids: A Short Survey. IEEE Electrical Power and Energy Conference (EPEC), Ottawa, Canada
Paper
Published
Refereed?: Yes, Invited?: No

11. I Sorkhoh, A Arfaoui, M. Khabbaz, C. Assi. (2022). Optimizing Information Freshness in RIS-Assisted Cooperative Autonomous Driving. IEEE International Conference on Communications, Seoul, Korea, South
Paper
Published
Refereed?: Yes, Invited?: No
12. A. Muhamad, M Kadry, A Arfaoui, C Assi. (2022). Leveraging Reconfigurable Intelligent Surface to Minimize Age of Information in Wireless Networks. IEEE International Conference on Communications, Seoul, Korea, South
Paper
Published
Refereed?: Yes, Invited?: No
13. A Abazari, M Zadsar, M Ghafouri, C Assi. (2022). Detection of Cyber-Physical Attacks Using Optimal Recursive Least Square in an Islanded Microgrid. IEEE Power & Energy Society General Meeting (PESGM), United States of America
Paper
Published
Refereed?: Yes, Invited?: No
14. E. Haber, M. Kadry, S Sharafeddine, C Assi. (2022). Latency and Reliability Aware Edge Computation Offloading in IRS-aided Networks. IEEE International Conference on Communications, Seoul, Korea, South
Paper
Published
Refereed?: Yes, Invited?: No
15. Mohammed Almekhlafi, Mohamed Amine Arfaoui and Chadi Assi, Ali Ghrayeb. (2021). Joint Resource and Power Allocation for URLLC-eMBB traffics multiplexing in 6G Wireless Networks. IEEE ICC,
Paper
Published
Refereed?: Yes, Invited?: No
16. 1. Taous Madi, Hyame Alameddine, Makan Pourzandi, Amine Boukhtouta, Moataz Shoukry, Chadi Assi ". (2021). AutoGuard: A Dual Intelligence Proactive Anomaly Detection at Application-Layer in 5G Networks. European Symposium on Research in Computer Security (ESORICS), Darmstadt, Germany
Paper
Published
Refereed?: Yes, Invited?: No
17. Mohamed Amine Arfaoui, Ali Ghrayeb, Chadi Assi. (2021). Cascaded Artificial Neural Networks for Proactive Power Allocation in Indoor LiFi Systems. IEEE ICC,
Paper
Published
Refereed?: Yes, Invited?: No
18. Chadi Assi, Mohammed Almekhlafi, Amine Arfaoui, Mohamed Elhattab, and Ali Ghrayeb. (2021). Joint Scheduling of eMBB and URLLC Services in RIS-Aided Downlink Cellular Networks. IEEE ICCCN,
Paper
Accepted
Refereed?: Yes, Invited?: Yes
19. Ibrahim Sorkhoh, Dariush Ebrahimi, Sanaa Sharafeddine, Chadi Assi:. (2020). Minimizing the Age of Information in Intelligent Transportation Systems. IEEE CloudNet,
Paper
Published
Refereed?: Yes, Invited?: Yes

20. Ahmed Al-Hilo, Moataz Samir, Chadi Assi, Sanaa Sharafeddine, Dariush Ebrahimi. (2020). Cooperative content delivery in UAV-RSU assisted vehicular networks. ACM DroneCom @ MOBICOM, London, United Kingdom
Paper
Published
Refereed?: Yes, Invited?: No
21. Ahmed Al-Hilo, Moataz Samir, Chadi Assi, Sanaa Sharafeddine, Dariush Ebrahimi. (2020). Cooperative content delivery in UAV-RSU assisted vehicular networks. ACM Mobicom DroneCom Workshop,
Paper
Published
Refereed?: Yes, Invited?: No
22. A. Mrad, S Sharafeddine, A. Al-Hilo, C. Assi. (2020). NOMA-Aided UAV Data Collection from Time-Constrained IoT Devices. IEEE International Conference on Communications, Dublin, Ireland
Paper
Published
Refereed?: Yes, Invited?: No
23. Joseph Antoun, Mohammad Ekramul Kabir, Ribal Atallah, Bassam Moussa, Mohsen Ghafouri, Chadi Assi. (2020). Impact Analysis of EV Preconditioning on the Residential Distribution Network. IEEE SmartGridComm,
Paper
Published
Refereed?: Yes, Invited?: No
24. Ali Muhammad, Long Qu, Chadi Assi. (2020). Delay-Aware Multi-Source Multicast Resource optimization in NFV-Enabled Network. IEEE ICC,
Paper
Published
Refereed?: Yes, Invited?: No
25. Phuc Dinh, Mohamed Amine Arfaoui, Sanaa Sharafeddine, Chadi Assi, Ali Ghrayeb. (2020). A Low-Complexity Approach for Sum-Rate Maximization in Cooperative NOMA Enhanced Cellular Networks. IEEE ICC,
Paper
Published
Refereed?: Yes, Invited?: No
26. Eli Haber, Tri Nguyen, Chadi Assi, Wessam Ajib. (2019). An Energy-efficient Task Offloading Solution for MEC-based IoT in Ultra-dense Networks. IEEE WCNC, Morocco
Paper
Submitted
Refereed?: Yes, Invited?: No
27. M. Arfaoui, M. Soltani, I. Tavakkolnia, A. Ghrayeb, C. Assi, H. Hass, M. Hasna, M. Safari. (2019). SNR Statistics for Indoor VLC Mobile Users with Random Orientation. IEEE WCNC, Morocco
Paper
Submitted
Refereed?: Yes, Invited?: No
28. Huu Phuc, Tri Nguyen, Chadi Assi, Wessam Ajib. (2019). Joint Beamforming and Location Optimization for Cooperative Content-Aware UAVs. IEEE WCNC, Morocco
Paper
Submitted
Refereed?: Yes, Invited?: No

29. Sadegh Torabi, Elias Bou-Harb, Chadi Assi, Mario Galluscio, Amine Boukhtouta, and Mourad Debbabi. (2018). Inferring, Characterizing, and Investigating Internet-Scale Malicious IoT Device Activities: A Network Telescope Perspective. IEEE/IFIP International Conference on Dependable Systems and Networks, DSN 2018, Luxembourg
Paper
Published
Refereed?: Yes, Invited?: No
30. T. Nguyen, W. Ajib, C. Assi. (2018). A Novel Cooperative NOMA in Wireless Backhaul Heterogeneous Networks. IEEE Globecom 2018,
Paper
Published
Refereed?: Yes, Invited?: No
31. Mohaned Chraiti, Ali Ghayeb, Chadi Assi. (2018). A High-Throughput NOMA Scheme Exploiting Partial Similarity Among Users Sequences. IEEE WCNC 2018,
Paper
Submitted
Refereed?: Yes, Invited?: No
32. E. Kabeer, M. Tushar, J. Yan, C. Assi,. (2018). Centralized/Decentralized Scheduling of EVs Charging at a Solar Power Based Charging Station. IEEE WCNC 2018,
Paper
Submitted
Refereed?: Yes, Invited?: No
33. M. Shokry, M. Chraiti, C. Assi, A. Ghayeb. (2018). Joint Optimization of UAV Trajectory and Radio Resource Allocation for Drive-Thru Vehicular Networks". IEEE WNCN 2018,
Paper
Submitted
Refereed?: Yes, Invited?: No
34. Elie Haber, Tri Nguyen, Dariush Ebrahimi, and Chadi Assi. (2018). Computational Cost and Energy Efficient Task Offloading in Hierarchical Edge-Clouds. Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC),
Paper
Accepted
Refereed?: Yes, Invited?: No
35. D. Ebrahimi, S. Sharafeddine, P Ho, C. Assi. (2018). Data Collection in Wireless Sensor Networks using UAV and Compressive Data Gathering. IEEE Globecom,
Paper
Published
Refereed?: Yes, Invited?: No
36. Mohamed Amine Arfaoui, Ali Ghayeb, Chadi Assi, and Mazen Hasna. (2018). Discrete Input Signaling for Secure MISO VLC Systems with Randomly Located Eavesdroppers. Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (IEEE PIMRC), Italy
Paper
Published
Refereed?: Yes, Invited?: No
37. Mohaned Chraiti, Ali Ghayeb, Chadi Assi. (2017). A NOMA Scheme for a Two-User MISO Downlink Channel with Unknown CSIT. IEEE GLOBECOM, Singapore
Paper
Published
Refereed?: Yes, Invited?: No

38. R. Atallah, C. Assi, M. Khabbaz,. (2017). Deep Reinforcement Learning-based Scheduling for Roadside Communication Networks. 16th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt), IEEE, Paris, France
Paper
Published
Refereed?: Yes, Invited?: No
39. Hyame Assem Alameddine, Long Qu, Chadi Assi. (2017). Scheduling service function chains for ultra-low latency network services. 13th International Conference on Network and Service (IEEE/IFIP CNSM 2017), Tokyo, Japan
Paper
Published
Refereed?: Yes, Invited?: No
40. Mohaned Chraiti, Ali Ghrayeb, Chadi Assi. (2017). Onmanaging interference in a one-dimensional space over time-invariant channels. International Conference on Communications, Paris, France
Paper
Published
Refereed?: Yes, Invited?: No
41. Mohamed-Amine Arfaoui, Ali Ghrayeb, Chadi Assi. (2017). Achievable Secrecy Sum-Rate of the MISO VLC Broadcast Channel with Confidential Messages. IEEE Globecom, Singapore
Paper
Published
Refereed?: Yes, Invited?: No
42. Reem Kateb, Parisa Akaber, Mosaddek Hossain Kamal Tushar, Mourad Debbabi, Chadi Assi. (2017). Delay aware measurements gathering in WAMS communication network. IEEE GlobalSIP, Montreal, Canada
Paper
Published
Refereed?: Yes, Invited?: No
43. Mohamed-Amine Arfaoui, Ali Ghrayeb, Chadi Assi. (2017). On the achievable secrecy rate of the MIMO VLC Gaussian wiretap channel. Personal, Indoor and Mobile Radio Communications (PIMRC), IEEE, Montreal, Canada
Paper
Published
Refereed?: Yes, Invited?: No
44. Tri Minh Nguyen, Wessam Ajib, Chadi Assi. (2017). Online Algorithm for Wireless Backhaul HetNets with Advanced Small Cell Buffering. The 26th International Conference on Computer Communications and Networks (ICCCN 2017), Vancouver, Canada
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Disclosures

1. Vulnerabilities found on backend systems of a major EV charging operator
Disclosed
Major design flaws found on the management system of a major EV charging network operator.
Vulnerabilities discovered and reported to the operator. The operator acknowledged and preparing fixes.

2. Common Vulnerabilities on EV charging product; vendor - Schneider

Disclosed

Cyber threat vulnerabilities found on EVLink products, vulnerabilities reported to vendor and acknowledged. See the below report: Schneider Electric Patches 7 Bugs in EVlink Products <https://www.bankinfosecurity.com/schneider-electric-patches-7-bugs-in-evlink-products-a-18215>



This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Protected when completed

Dr. Anjali Awasthi

Correspondence language: English

Contact Information

The primary information is denoted by (*)

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Primary Affiliation (*)

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Montreal Quebec H3G2W1
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This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Protected when completed

Dr. Anjali Awasthi

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes
Hindi	Yes	Yes	Yes	Yes	Yes

Degrees

- 2004/11 Doctorate, Automation, Université de Metz
Supervisors: Dr. Jean-Marie Proth, Dr. Alexandre Dolgui, 2002/2 - 2004/12
- 2000/5 Master's Thesis, Industrial and Management Engineering, Indian Institute of Technology Kanpur
Supervisors: Dr. Rahul Varman, 1998/5 - 2000/5

Recognitions

- 2019/1 Best Paper Award
International Journal of Modeling and Simulation
Prize / Award
A system dynamics based simulation model to evaluate regulatory policies for sustainable transportation planning" by Sayyadi R., and Awasthi A.
- 2018/6 Eldon Gunn Service Award - 0
Canadian Operational Research Society (CORS)
Prize / Award
The Eldon Gunn Service Award is presented to members of the society who have made outstanding contributions of time and service to the society, at the national or local level, as conference organizers or as editors of CORS publications.
- 2017/4 - 2021/4 Education Chair
Canadian Operations Research Society (CORS)
Honor
Education Chair

User Profile

Research Specialization Keywords: City Logistics, Data mining, IT and Decision making, Modelling and Simulation, Quality Management, Sustainable Supply Chains

Employment

2019/5	Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Professor Tenure Status: Tenure
2013/8 - 2019/8	Associate Professor CIISE, Engineering and Computer Sciences, Concordia University Full-time, Associate Professor Tenure Status: Tenure
2008/8 - 2013/7	Assistant Professor Engineering and Computer Science, Concordia University Full-time, Assistant Professor Tenure Status: Tenure Track
2007/1 - 2008/7	Project Advisor Sauder School of Business, University of British Columbia Full-time Tenure Status: Non Tenure Track
2006/8 - 2006/12	Postdoc Researcher Génie mécanique, Université Laval Full-time Tenure Status: Non Tenure Track
2005/2 - 2006/7	Research Engineer Logistique et Organisation Industrielles, EIGSI La Rochelle
2000/6 - 2001/12	Software Engineer Software Development, Tata Consultancy Services

Research Funding History

Awarded [n=8]

2022/4 - 2028/3 Principal Investigator	Autonomous goods distribution planning under complex urban environments, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 155,000 Portion of Funding Received - 100 Funding Competitive?: Yes
2019/1 - 2027/3 Co-investigator	Advanced Manufacturing Automation, Digitization and Optimization - AMADO, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 999,999 Portion of Funding Received - 10 Funding Competitive?: Yes
2018/3 - 2023/3 Co-applicant	A digital technology platform for supply chain, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) CRD

Total Funding - 885,000
 Portion of Funding Received - 20
 Funding Competitive?: Yes

2019/1 - 2022/1
 Co-investigator

Human errors analysis in an aircraft engine assembly center, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate

Total Funding - 60,000
 Portion of Funding Received - 50
 Funding Competitive?: Yes

2015/5 - 2020/4
 Principal Applicant

Sustainable city logistics planning under collaboration, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
 Discovery Grant

Total Funding - 110,000
 Portion of Funding Received - 100
 Funding Competitive?: Yes

2019/9 - 2020/2
 Principal Applicant

Industrial Economics Research Based on Multi-tier Supply Chain in the Background of Industry 4.0, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Globalink Research Award

Total Funding - 5,000
 Portion of Funding Received - 100
 Funding Competitive?: Yes

2018/12 - 2019/6
 Co-applicant

Logistics optimization models for breast cancer patients, Grant

Funding Sources:

IVADO
 Total Funding - 25,000
 Portion of Funding Received - 50
 Funding Competitive?: Yes

2017/2 - 2017/8
 Principal Applicant

Investigating the impact of greening harbor trucking initiative on port sustainability performance, Grant

Funding Sources:

NSERC ENGAGE
 Total Funding - 25,000
 Portion of Funding Received - 100
 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=35]

2022/9 - 2024/12 Principal Supervisor	Nitish Suvarna (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Assessing Impact of Autonomous Vehicles on Supply Chain Performance – A Case Study of Agri-Food Supply Chain Present Position: MASc Student, Concordia University
2022/9 - 2024/12 Principal Supervisor	Manmeet Singh (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Incident Management for Autonomous Electric Vehicles Present Position: MASc Student, Concordia University
2022/9 - 2024/12 Principal Supervisor	Rubel Kar (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: User requirements planning for autonomous vehicles in urban areas Present Position: MASc Student, Concordia University
2022/8 - 2024/12 Principal Supervisor	Varshini Venkatesh (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Renewable energy planning for autonomous vehicles Present Position: MASc Student, Concordia University
2022/1 - 2024/12 Principal Supervisor	Samiul Bashir Shihab (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Autonomous vehicles and sustainable supply chain management Present Position: MASc Student, Concordia University
2022/1 - 2024/12 Principal Supervisor	Mina Nikdast (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Autonomous vehicles planning for urban freight transport Present Position: MASc Student, Concordia University
2021/1 - 2024/12 Principal Supervisor	Marziehsadat Arabi (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Simulation of charging management strategies for autonomous electric vehicles Present Position: MASc Student, Concordia University
2021/1 - 2024/7 Principal Supervisor	Murali Krishna Vakada (In Progress) , Concordia University Student Degree Expected Date: 2024/7 Thesis/Project Title: Evaluating Infrastructure Demand and Optimizing Charging Strategies for Battery Electric Bus Fleet- A Pilot Study on Concordia Shuttle Fleet Present Position: MASc Student
2019/9 - 2021/10 Principal Supervisor	Aishwary Nipane (Completed) , Concordia University Thesis/Project Title: Comprehending user inclinations towards autonomous vehicles Present Position: Programmer Analyst, Berry Global
2019/9 - 2021/9 Principal Supervisor	Amir Zohouri (Withdrawn) , Concordia University Thesis/Project Title: Large scale systems simulation for autonomous vehicles Present Position: Student
2019/9 - 2021/9 Principal Supervisor	Hiva Hosseini (Completed) , Concordia University Thesis/Project Title: Customer requirements modeling for smart cities Present Position: Student

2019/9 - 2021/9 Principal Supervisor	Ali Gamarooni (Completed) , Concordia University Thesis/Project Title: Standards development for airworthiness-related organizations Present Position: Student
2019/9 - 2021/9 Principal Supervisor	Faridoddin Moazzeni (Completed) , Concordia University Thesis/Project Title: Global supply chain quality management Present Position: Student
2019/8 - 2021/8 Principal Supervisor	Sarah Niazalizadeh Moghadam (Withdrawn) , Concordia University Thesis/Project Title: User requirements analysis for autonomous vehicles Present Position: Student
2019/4 - 2020/4 Principal Supervisor	Elena Golchin (Completed) , Concordia University Thesis/Project Title: Fleet management and energy management for self driving vehicles Present Position: Student
2019/4 - 2020/4 Principal Supervisor	Mehdi Azad (Completed) , Concordia University Thesis/Project Title: Market maturity assessment for autonomous vehicles Present Position: Student
2019/4 - 2021/4 Co-Supervisor	Payam Abbasi (Completed) , Concordia University Thesis/Project Title: Network requirements planning for Industrial Symbiosis Present Position: Student
2019/1 - 2021/1 Co-Supervisor	Ali Alirezaee (Completed) , Concordia University Thesis/Project Title: IoT enabled supply chain planning for cold produce Present Position: Student
2019/1 - 2020/12 Principal Supervisor	Asma Ramjean (Completed) , Concordia University Thesis/Project Title: Digital supply chain quality management Present Position: Student
2018/9 - 2020/9 Co-Supervisor	Seyedeh Negar Ghodsi (Completed) , Concordia University Thesis/Project Title: Facility location planning under disruption Present Position: Student
2018/9 - 2020/9 Principal Supervisor	Ujjwal Khanna (Completed) , Concordia University Thesis/Project Title: Multicriteria models for pedestrian safety planning Present Position: Student
2018/9 - 2020/9 Co-Supervisor	Mohd Safwan Ahmad Ansari (Completed) , Concordia University Thesis/Project Title: Deep learning based survival analysis Present Position: Student
2018/9 - 2020/8 Co-Supervisor	Akhil Raj Kizhakkan (Completed) , Concordia University Thesis/Project Title: Electric vehicle charging station location planning Present Position: Student
2018/1 - 2020/8 Principal Supervisor	Mohsen Amoie (Completed) , Concordia University Thesis/Project Title: Data mining approaches for traffic congestion prediction Present Position: Student
2017/9 - 2020/9 Principal Supervisor	Ehsan Sharif Nia (Completed) , Concordia University Thesis/Project Title: Logistics optimization for rural cancer patients Present Position: Student
2017/4 - 2019/4 Co-Supervisor	Suganya Jayapalan (Completed) , Concordia University Thesis/Project Title: Information Sharing for Improved Supply Chain Collaboration - Simulation Analysis Present Position: Project Manager

2017/4 - 2020/8 Principal Supervisor	Omar Lucas (Completed) , Concordia University Thesis/Project Title: Humanitarian Relief Supply Chains Present Position: Student
2016/8 - 2018/8 Principal Supervisor	Rupinder Kaur Bhullar (Completed) , Concordia University Thesis/Project Title: Enterprise, project and workforce selection for Industry 4.0 Present Position: Research Assistant
2016/8 - 2018/8 Principal Supervisor	Akolade Adegoke (Completed) , Concordia University Thesis/Project Title: Benchmarking sustainability performance of Ports Present Position: Management Consultant, Deloitte
2016/8 - 2018/8 Principal Supervisor	Navneet Kaur Bajwa (Completed) , Concordia University Thesis/Project Title: Modelling and simulation of blockchain in education based system Present Position: Research Assistant
2016/8 - 2017/11 Principal Supervisor	Vignesh Alageshan (Completed) , Concordia University Thesis/Project Title: Simulating the impact of Green Harbor Trucking initiative on Port of Montreal Present Position: Business Analyst
2015/5 - 2017/5 Principal Supervisor	Abbas Tavassoli (Completed) , Concordia University Thesis/Project Title: A Multicriteria Framework for Benchmarking Sustainability Performance of Organizations Present Position: Project Quality Engineer, Faiveley Vapor Rail, A Wabtec Company
2015/4 - 2017/5 Principal Supervisor	Mina Jafari (Completed) , Concordia University Thesis/Project Title: Assessing the Impact of Sustainable Practices on Organizational Performance Present Position: Industrial Engineer
2014/1 - 2017/4 Principal Supervisor	Rupinder Kaur (Completed) , Concordia University Thesis/Project Title: Bibliometric Analysis for the Field of City Logistics: Study of Procedia- Journal of Social and Behavioral Science, 2010-2016 Present Position: Project Manager
2014/1 - 2017/9 Principal Supervisor	Mohd Jawad Ur Rahman (Completed) , Concordia University Thesis/Project Title: Predicting road transport GHG emissions with application for Canada Present Position: Business Systems Analyst, TD Bank

Doctorate [n=19]

2023/9 - 2027/12 Principal Supervisor	Suresh Nagina (In Progress) , Concordia University Student Degree Expected Date: 2027/12 Thesis/Project Title: User requirements modeling for autonomous electric vehicles Present Position: PhD student, Concordia University
2023/9 - 2028/12 Principal Supervisor	Abdusami Abdurahman (In Progress) , Concordia University Thesis/Project Title: Fleet management strategies for autonomous electric vehicles Present Position: PhD student
2023/7 - 2028/12 Principal Supervisor	Basim Tareq M Alghabashi, Concordia University Thesis/Project Title: Data mining models for autonomous vehicle routing Present Position: PhD student

2022/1 - 2026/12 Co-Supervisor	Sarah Farahdel (In Progress) , Concordia University Student Degree Expected Date: 2027/12 Thesis/Project Title: A Comparative Analysis Between Sustainability Performance Measurement Models and Sustainability Assessment Tools for Higher Educational Institutes: A Critical Literature Review Present Position: PhD student, Concordia University
2021/9 - 2028/12 Co-Supervisor	Rupinder Kaur, Concordia University Thesis/Project Title: Environment based design models for project team planning Present Position: PhD student
2021/1 - 2027/12 Principal Supervisor	Behrouz Samieyan (In Progress) , Concordia University Student Degree Expected Date: 2027/12 Thesis/Project Title: Simulating autonomous vehicles for last mile delivery Present Position: PhD student, Concordia University
2019/1 - 2022/12 Co-Supervisor	Ali Roozbeh Nia (Completed) , Concordia University Thesis/Project Title: Collaborative inventory planning and forecasting Present Position: Student
2019/1 - 2022/12 Principal Supervisor	Chinedu Egbuonu (Withdrawn) , Concordia University Thesis/Project Title: Track and trace technologies for port logistics Present Position: Student
2018/5 - 2024/12 Principal Supervisor	Osama Alshareet (In Progress) , Concordia University Student Degree Expected Date: 2027/12 Thesis/Project Title: Artificial Intelligence-Powered Recommender Solutions for E-commerce: A Novel Multi-Dimensional Evaluation and Innovation Approach Present Position: PhD student, Concordia University
2018/1 - 2023/12 Principal Supervisor	Samia Hilal (Withdrawn) , Concordia University Thesis/Project Title: Integration platform for buyer supplier collaboration Present Position: PhD Student
2017/8 - 2024/12 Principal Supervisor	Khasawneh Mohammad (In Progress) , Concordia University Thesis/Project Title: Metaheuristics for Smart Traffic Management Systems Present Position: PhD Student
2015/1 - 2020/12 Principal Supervisor	Behnam Izadi (In Progress) , Concordia University Thesis/Project Title: Autonomous carsharing systems Present Position: PhD Student
2013/9 - 2020/12 Co-Supervisor	Matin Giahi Foomani (Completed) , Concordia University Thesis/Project Title: Intelligent Transportation Systems Present Position: PhD Student
2013/9 - 2020/12 Co-Supervisor	Hassan Mukhtar (Withdrawn) , Concordia University Thesis/Project Title: Supplier quality management in global supply chains Present Position: PhD Student
2013/9 - 2020/9 Principal Supervisor	Ali Khabbazian (In Progress) , Concordia University Thesis/Project Title: Supplier selection under disruption Present Position: Student
2013/5 - 2017/12 Principal Supervisor	Hassan Algarni (Completed) , Concordia University Thesis/Project Title: Optimal design and analysis of solar PV systems Present Position: Faculty Member, Jubail Industrial College, Saudi Arabia
2013/4 - 2017/12 Principal Supervisor	Taiwo Adetiloye (Completed) , Concordia University Thesis/Project Title: Predicting short term traffic congestion on urban motorway networks Present Position: Data Scientist, Christus Health, USA

2012/9 - 2017/2	Aqeel Asaad Al Salem (Completed) , Concordia University
Principal Supervisor	Thesis/Project Title: Managing Consistency and Consensus in Group Decision Making with Incomplete Fuzzy Preference Relations Present Position: Faculty Member, Northern Border University, Saudi Arabia
2012/5 - 2020/12	Afify Badr (Completed) , Concordia University
Principal Supervisor	Thesis/Project Title: Supply chain planning under disruption Present Position: Student

Presentations

1. Murali K Vakada, Anjali Awasthi. (2023). Evaluating charging infrastructure demand and performance parameters for a university electric bus fleet. ORSI 2023, Bangalore, India
Invited?: No, Keynote?: No
2. Khosrow Noshad, Anjali Awasthi, Mahesh Sharma. (2023). Critical criteria for supplier quality development. SOM 2023, Shillong, India
Invited?: No, Keynote?: No
3. Pradeep Mishra, Anjali Awasthi. (2023). Green Hydrogen Supply Chain Ecosystem in India - Cost, Technology & Policy Perspective. SOM 2023, Shillong, India
Invited?: No, Keynote?: No
4. (2020). Industry 4.0 and Digital Supply Chain Management. Online webinar on "Industry 4.0" for Women counseling Cell, IPS College of Technology and Management, Gwalior, July 10, 2020 at 02:00pm IST., Gwalior, India
Main Audience: Researcher
Invited?: Yes, Keynote?: No
5. (2020). Research opportunities in Digitization and Sustainable Supply Chain Management. Lessons in Research Excellence' lecture series, 20 July 2020, at 2.00 PM (IST) organized by Doon University, Mothrowala Road, PO Ajabpur, Dehradun, Uttarakhand, India
Main Audience: Researcher
Invited?: Yes, Keynote?: No
6. Awasthi A. (2019). Sustainable City Logistics Planning : A multicriteria perspective. CORS 2019, Saskatoon, Canada
Invited?: No, Keynote?: No
7. Seyedehnegar Ghodsi, Farnoosh Naderkhani, Anjali Awasthi. (2019). Application of Markov Decision Process in Facility Location under Disruption. CORS 2019, Saskatoon, Canada
Invited?: No, Keynote?: No
8. Mohsen Amoei, Anjali Awasthi. (2019). Traffic detection and prediction with CNNs and regression analysis. CORS 2019, Saskatoon, Canada
Invited?: No, Keynote?: No
9. Mohd Safwan Ahmad Ansari, Farnoosh Naderkhani, Anjali Awasthi. (2019). Deep learning based survival analysis. CORS 2019, Saskatoon, Canada
Invited?: No, Keynote?: No
10. Izadi-Najafabadi B., Awasthi A. (2018). Preliminary study on autonomous vehicle fleet size for carsharing under demand uncertainty. Optimization Days, Montreal, Canada
Invited?: No, Keynote?: No
11. Saleh F., Awasthi A. (2018). Multi-tier supplier selection using total cost of ownership and data envelopment analysis. CORS 2018, Halifax, Canada
Invited?: No, Keynote?: No

12. Kaur R., Awasthi A. (2018). Cross-disciplinary workforce planning for Industry 4.0. Optimization Days, Montreal, Canada
Invited?: No, Keynote?: No
13. Adegoke A., Awasthi A. (2018). Benchmarking port sustainability performance using Data Envelopment Analysis. Optimization Days, Montreal, Canada
Invited?: No, Keynote?: No

Text Interviews

2024/02/07	Canadian cities embrace AI in the face of unprecedented gridlock, The globe and mail
2019/07/16	Pont Samuel-De Champlain : six voies a suivre pour une mobilite durable, La Conversation
2019/07/16	Les clés du succès du pont Samuel-De Champlain, Le Devoir
2019/06/25	Pont Samuel-De Champlain: un modèle pour l'avenir, dit un expert, Metro
2019/06/22	#MyCanada2067 : Vision of the future, Concordia Magazine
2019/04/02	Tackling traffic congestion, Concordia Magazine
2019/04/02	Optimiser le réseau de transport avant de l'élargir, Le devoir
2019/02/12	Connected vehicles panel, Globe Drive Mobility 2019
2019/02/12	Today's data-collection fuels the automated urban transport of tomorrow, The Globe and Mail
2019/02/06	The future is the city, Concordia Magazine
2018/12/04	A new study proposes smarter ways for cities to approach mass transit issues, Concordia Magazine
2018/09/24	Sustainable supply chain: How can we balance commercial need with mobility ?, Concordia Magazine

Publications

Journal Articles

1. Hassan Algarni, Arunachalam Sundaram, Anjali Awasthi, Rahul Chandel, Salwan Tajjour, Shyam Singh Chandel. (2024). A Comprehensive Review of Most Competitive Maximum Power Point Tracking Techniques for Enhanced Solar Photovoltaic Power Generation. Journal of Renewable Energy and Environment.
In Press
Refereed?: Yes, Open Access?: No
2. Ganji, S. S., Najafi, M., Mora-Cruz, A., Awasthi, A., & Ajirlu, S. F. (2023). Assessment of airline industry using a new double-frontier cross-efficiency method based on prospect theory. Annals of Operations Research. : 1-61.
Published
Refereed?: Yes, Open Access?: No
3. Nia, A. R., Awasthi, A., & Bhuiyan, N. (2023). Integrate exergy costs and carbon reduction policy in order to optimize the sustainability development of coal supply chains in uncertain conditions. International Journal of Production Economics. 257(108772)
Published
Refereed?: Yes, Open Access?: No

4. Alshareet, O., & Awasthi, A. (2023). Enhancing e-commerce recommendations with a novel scale-aware spectral graph wavelets framework. *International Journal of Data Science and Analytics.* : 1-14.
Published
Refereed?: Yes, Open Access?: Yes
5. Khasawneh, M. A., & Awasthi, A. (2023). Intelligent Meta-Heuristic-Based Optimization of Traffic Light Timing Using Artificial Intelligence Techniques. *Electronics.* 12(24): 49-68.
Published
Refereed?: Yes, Open Access?: Yes
6. Roozbeh Nia, A., Awasthi, A., & Bhuiyan, N. (2023). Assessment of coal supply chain under carbon trade policy by extended exergy accounting method. *Flexible Services and Manufacturing Journal.* : 1-69.
Published
Refereed?: Yes, Open Access?: No
7. Khasawneh, M. A., & Awasthi, A. (2023). Intelligent Meta-Heuristic-Based Optimization of Traffic Light Timing Using Artificial Intelligence Techniques. *Electronics.* 12(24): 49-68.
Published
Refereed?: Yes, Open Access?: Yes
8. Narwane, V. S., Raut, R. D., Gardas, B. B., Narkhede, B. E., & Awasthi, A. (2022). Examining smart manufacturing challenges in the context of micro, small and medium enterprises. *International Journal of Computer Integrated Manufacturing.* 35(12): 1395-1412.
Published
Refereed?: Yes, Open Access?: No
9. Afify, B., Soeanu, A., & Awasthi, A. (2021). Separation linearization approach for the capacitated facility location problem under disruption. *Expert Systems with Applications.* 169: 114-187.
Published
Refereed?: Yes, Open Access?: No
10. Al Salem, A. A., & Awasthi, A. (2021). Two new methods for decision-making with incomplete reciprocal fuzzy preference relations based on additive consistency. *International Journal of Modelling and Simulation.* 41(1): 24-38.
Published
Refereed?: Yes, Open Access?: No
11. Al Salem, A. A., & Awasthi, A. (2021). New consensus measure for group decision-making based on Spearman's correlation coefficient for reciprocal fuzzy preference relations. *International Journal of Modelling and Simulation.* 41(3): 163-175.
Published
Refereed?: Yes, Open Access?: No
12. Nia, A. R., Awasthi, A., & Bhuiyan, N. (2021). Industry 4.0 and demand forecasting of the energy supply chain: A literature review. *Computers & Industrial Engineering.* 154: 107-128.
Published
Refereed?: Yes, Open Access?: No
13. Kumar, L., Hossain, N. U. I., Fazio, S. A., Awasthi, A., Jaradat, R., & Babski-Reeves, K. (2021). A data driven decision model for assessing the enablers of quality dimensions: Context of industry 4.0. *CIRP Journal of Manufacturing Science and Technology.* 35: 896-910.
Published
Refereed?: Yes, Open Access?: No
14. Kaur, R., Awasthi, A., & Grzybowska, K. (2020). Evaluation of Key Skills Supporting Industry 4.0—A Review of Literature and Practice. In *Sustainable Logistics and Production in Industry 4.0.* : 19-29.
Published
Refereed?: Yes, Open Access?: No

15. Verma, M., & Awasthi, A. (2020). Evaluating bikesharing service quality: a case study for BIXI, Montreal. *International Journal of Productivity and Quality Management*. 29(1): 45-61.
Accepted
Refereed?: Yes, Open Access?: No
16. Ramanathan, U., Mazzola, E., Mohan, U., Bruccoleri, M., Awasthi, A., & Garza-Reyes, J. A. (2020). How selection of collaborating partners impact on the green performance of global businesses? An empirical study of green sustainability. *Production Planning & Control*. : 1-16.
Published
Refereed?: Yes, Open Access?: No
17. Ezzati, S., Palma, C. D., Bettinger, P., Eriksson, L. O., & Awasthi, A. (2020). An integrated multi-criteria decision analysis and optimization modeling approach to spatially operational road decisions. *Canadian Journal of Forest Research*.
Published
Refereed?: Yes, Open Access?: No
18. Narwane, V. S., Raut, R. D., Mangla, S. K., Gardas, B. B., Narkhede, B. E., Awasthi, A., & Priyadarshinee, P. (2020). Mediating role of cloud of things in improving performance of small and medium enterprises in the Indian context. *Annals of Operations Research*. : 1-30.
Published
Refereed?: Yes, Open Access?: No
19. Al Salem, A. A., & Awasthi, A. (2020). New consensus measure for group decision-making based on Spearman's correlation coefficient for reciprocal fuzzy preference relations. *International Journal of Modelling and Simulation*. : 1-13.
Published
Refereed?: Yes, Open Access?: No
20. Zhou, R., Awasthi, A., & Stal-Le Cardinal, J. (2020). The main trends for multi-tier supply chain in Industry 4.0 based on Natural Language Processing. *Computers in Industry*. (103369)
Published
Refereed?: Yes, Open Access?: No
21. Moein, E., & Awasthi, A. (2020). Carsharing customer demand forecasting using causal, time series and neural network methods: a case study. *International Journal of Services and Operations Management*. 35(1): 36-57.
Published
Refereed?: Yes, Open Access?: No
22. Awasthi A., Omrani H., Gerber P. (2019). Investigating ideal-solution based multicriteria decision making techniques for sustainability evaluation of urban mobility projects. *Transportation Research A*. 116: 247-259.
Published
Refereed?: Yes, Open Access?: No
23. Afify B., Ray S., Soeanu A., Awasthi A., Debbabi M., Allouche M. (2019). Evolutionary learning algorithm for reliable facility location under disruption. *Expert Systems with Applications*. 115: 223-244.
Published
Refereed?: Yes, Open Access?: No
24. Shashikumar S., Raut R.D., Narwane V.S., Gardas B.B., Narkhede B. E., Awasthi A. (2019). A Novel Approach to determine the Cell Formation using Heuristics Approach. *OPSEARCH*.
Accepted
Refereed?: Yes, Open Access?: No

25. Al Garni H. Z., Awasthi A., Wright D. (2019). Optimal orientation angles for maximizing energy yield for solar PV in Saudi Arabia. *Renewable Energy*. 133: 538-550.
Published
Refereed?: Yes, Open Access?: No
26. Bag S., Tiwari M.K., Kumar S., Awasthi A., (2019). A noise correction-based approach to support a recommender system in a highly sparse rating environment. *Decision Support Systems*.
Published
Refereed?: Yes, Open Access?: No
27. Kaur R. Awasthi A. (2018). City Logistics: a review and bibliometric analysis. *International Journal of Bibliometrics in Business and Management*. 1(2): 160-188.
Published
Refereed?: Yes, Open Access?: No
28. Kaur J., Sidhu R., Awasthi A., Srivastava S. K. (2018). A Pareto investigation on critical barriers in green supply chain management. *International Journal of Management Science and Engineering Management*. : 1-11.
Published
Refereed?: Yes, Open Access?: No
29. Kaur J., Anjali Awasthi. (2018). A systematic literature review on barriers in green supply chain management. *International Journal of Logistics Systems and Management*. 30(3): 330-348.
Accepted
Refereed?: Yes, Open Access?: No
30. Sayyadi, R., Awasthi, A. (2018). A simulation-based optimisation approach for identifying key determinants for sustainable transportation planning. *International Journal of Systems Science: Operations and Logistics*. 5(2): 161-174.
Published
Refereed?: Yes, Open Access?: No
31. Al Garni H.Z., Awasthi A., Ramli MAM. (2018). Optimal design and analysis of grid connected photovoltaic under different tracking systems using HOMER. *Energy Conversion and Management*. 155: 42-57.
Published
Refereed?: Yes, Open Access?: No
32. Awasthi A., Omrani H. (2018). A goal-oriented approach based on fuzzy axiomatic design for sustainable mobility project selection. *International Journal of Services and Operations Management*. : 1-13.
Published
Refereed?: Yes, Open Access?: No
33. Kaur J., Sidhu R, Awasthi A., Chauhan S S, Goyal S. (2018). A DEMATEL based approach for investigating barriers in green supply chain management in Canadian manufacturing firms. *International Journal of Production Research*. 56(1-2): 312-332.
Published
Refereed?: Yes, Open Access?: No
34. Chakraborty T., Chauhan S.S., Awasthi A., Bouzdine-Chameeva T. (2018). Two-period pricing and ordering policy with price sensitive uncertain demand. *Journal of Operational Research Society*. : 1-18.
Published
Refereed?: Yes, Open Access?: No
35. Awasthi A., Omrani H. (2018). A scenario simulation approach for sustainable mobility project evaluation based on fuzzy cognitive maps. *International Journal of Modelling and Simulation*. : 1-11.
Published
Refereed?: Yes, Open Access?: No

36. Mobtaker A., Awasthi A., Chauhan S.S., Sophie DAmours. (2018). Wood based construction project supplier selection under uncertain starting date. *International Journal of Services and Operations Management*. 30(4): 480-504.
Published
Refereed?: Yes, Open Access?: No
37. Mahvash B., Awasthi A., Chauhan S.S. (2018). A column generation-based heuristic for the three-dimensional bin packing problem with rotation. *Journal of the Operational Research Society*,. 69(1): 78-90.
Published
Refereed?: Yes, Open Access?: No
38. Awasthi A., Sayyadi R., Khabbazian A. (2018). A combined approach integrating Gap analysis, QFD and AHP for improving logistics service quality. *International Journal of Logistics Systems and Management*. 29(2): 190-214.
Published
Refereed?: Yes, Open Access?: No
39. Noshad K., Awasthi A. (2018). Investigating critical criteria for supplier quality development. *International Journal of Management Science and Engineering Management*. : 1-10.
Accepted
Refereed?: Yes, Open Access?: No
40. Awasthi A., Govindan K., Gold S. (2018). Multi-tier sustainable global supplier selection using a fuzzy AHP-VIKOR based approach. *International Journal of Production Economics*. 195: 106-117.
Published
Refereed?: Yes, Open Access?: No
41. Al Salem A., Aqeel, Awasthi A. (2018). Investigating rank reversal in reciprocal fuzzy preference relationbased on additive consistency: Causes and solutions,. *Computers & Industrial Engineering*. (115): 573-581.
Published
Refereed?: Yes, Open Access?: No

Books

1. N Chemma, M El Amine Abdelli, A Awasthi, E Mogaji. (2022). *Management and Information Technology in the Digital Era: Challenges and Perspectives*.
Published, Emerald Publishing Limited
Refereed?: Yes
2. Awasthi A. (Eds.). (2021). *Mobility Management in Urban Areas: Models and Perspectives*.
Published, Novascience
Refereed?: Yes
3. Awasthi A., Grzybowska K. (Eds). (2019). *Handbook of Research on Interdisciplinary Approaches to Decision Making for Sustainable Supply Chain*.
In Press, IGI Global
Refereed?: Yes
4. Awasthi A. (Eds.). (2019). *Sustainable City Logistics Planning: Methods and Applications*.
In Press, NovaScience
Refereed?: Yes
5. Grzybowska K., Awasthi A., Sawhney R. K. (Eds). (2019). *Sustainable Logistics and Production in Industry 4.0 new opportunities and challenges*.
In Press, Springer
Refereed?: Yes

6. Prasenjit Chatterjee, Pamucar, D., Yazdani, M., & Awasthi, A. (2019). AAP Research Notes on Optimization and Decision Making Theories. Published, Apple Academic Press
Refereed?: Yes

Book Chapters

1. Nia, A. R., Awasthi, A., & Bhuiyan, N. (2020). Management of Sustainable Supply Chain and Industry 4.0: A Literature Review. Usha Ramanathan, Ramakrishnan Ramanathan. Sustainable Supply Chains: Strategies, Issues, and Models. : 1-47.
Published, Springer
Refereed?: Yes
2. Grzybowska, K., & Awasthi, A. (2020). Literature Review on Sustainable Logistics and Sustainable Production for Industry 4.0. Grzybowska, K., Awasthi, A., Sawhney R. In Sustainable Logistics and Production in Industry 4.0. : 1-18.
Published, Springer, Cham.
Refereed?: Yes
3. Awasthi, A., & Gold, S. (2020). Global Sustainable Supplier Selection: A Literature Review. Awasthi A. In Handbook of Research on Interdisciplinary Approaches to Decision Making for Sustainable Supply Chains. : 1-31.
Published, IGI Global
Refereed?: Yes
4. Al Garni H. Z., Awasthi A. (2018). Solar PV Power Plants Site Selection: A Review. I. Yahyaoui. Advances in Renewable Energies and Power Technologies. : 57-75.
Accepted, Elsevier
Refereed?: Yes

Conference Publications

1. Anjali Awasthi, Pradeep Mishra. (2023). Green Hydrogen Supply Chain Ecosystem in India- Cost, Technology & Policy Perspective. SOM 2023, (1-5)
Paper
Published
Refereed?: Yes, Invited?: No
2. Murali Vakada, Anjali Awasthi. (2023). Evaluating charging infrastructure demand and performance parameters for a university electric bus fleet. ORSI, (1-5)
Paper
Published
Refereed?: Yes, Invited?: No
3. Nipane, A. P., & Awasthi, A. (2021). *Interconnection Between Human's Psychological Elements and Their Influential Mediums and Channels Are Potential Accelerators to Comprehend People's Inclination Towards Autonomous Vehicles* (No. 5522). EasyChair.. IEEE 1st International Conference on Autonomous Systems (ICAS'21), (1-18)
Paper
Accepted
Refereed?: Yes, Invited?: No

4. Ahmad, S., Enshaei, N., Naderkhani, F., & Awasthi, A. (2020). Integrated Deep Learning and Statistical Process Control for Online Monitoring of Manufacturing Processes. In 2020 IEEE International Conference on Prognostics and Health Management (ICPHM) (pp. 1-6). IEEE., (1-6)
Conference Date: 2020/6
Paper
Published
Refereed?: Yes, Invited?: No
5. Kaur R., Awasthi A. (2019). Cross-disciplinary workforce selection for Industry 4.0. ICITL 2019, Windsor, (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
6. Ali Khabbazian, Anjali Awasthi, Chauhan Satyaveer. (2019). Supplier quality evaluation and order quantity allocation in pharmaceutical supply chains. CIGI QUALITA 2019, Montreal, (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
7. Gul Hassan, Taiwo Adetiloye, Shahab Mosallaie, Anjali Awasthi. (2019). A game theory based approach for collaboration strategy selection among supply chain partners. CIGI QUALITA 2019, (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
8. Tavassoli A., Awasthi A. (2018). Benchmarking sustainability performance of organizations using a multicriteria approach with application to Canadian market. Green Supply Chain (GSC 2018) conference, Thessaloniki, (1-5)
Paper
Published
Refereed?: Yes, Invited?: No

Ayda Basyouni

CONTACT INFORMATION

Concordia Institute for Information Systems Engineering
Concordia University, Montreal, Quebec
CANADA H3G 2W1.

E-mail: ayda.basyouni@concordia.ca

AREAS OF EXPERTISE

- **Computer Networks:** Modeling and Simulation; Performance Evaluation; Broadband wireless networks; Relay networks; Network Architectures and protocols; Networks Security; Wireless Networks Security; Cryptography; Cryptographic protocols
- **Optimization:** Optimization algorithms for solving problems such as network flow, shortest path problem, assignment problem, packing problem, routing problem, critical path analysis. All these combinatorial optimization tools are invaluable tools for solving complex systems optimization problems.
- **Resource Management:** Efficient and effective deployment of resources. The developed techniques, while applied to computer networks, can be generalized to include systems resources such as financial resources, inventory, human skills, production resources, and IT resources.
- **Systems Engineering:** Principles of Systems Engineering, Quality Assurance for Systems Engineering, Total Quality Project Management.

EDUCATION

Sept. 2004- Sept. 2008 Concordia University, Montreal, Quebec

Ph.D., Department of Electrical and Computer Engineering

- Thesis topic: Resource Management for Cross-Layered Star and Mesh Networks

1995- 1997 Queens University, Kingston, Ontario

M.Sc. Eng., Department of Electrical and Computer Engineering

- Thesis Title: "Formal Analysis of Wireless Cryptographic Protocols"

1985-1990 Cairo University, Cairo, Egypt

B.Sc. Department of Electronics and Communication Engineering

GRADUATE COURSES

Ph.D. Courses

- Probability and Stochastic Process
- Advanced Digital Wireless Transmission
- Introduction to Telecommunications Networks

M.Sc. Courses

- Cryptology and data security
- Discrete-time control systems
- Coding theory
- Computer communications
- Integrated Network switching techniques

HONORS AND AWARDS

- Nominated for 2018-2019 and 2019-2020 President's Excellence in Teaching Award
- ENCS Teaching Excellence Award for Sustained Excellence in Teaching 2017-2018
- NSERC PGS B (2004-2006)
- Campaign for a New Millennium Graduate Scholarship (2006-2007)
- Concordia University Internal Award (2004-2006)
- Teaching Fellow 2006-2008
- Queen's University Graduate Award (1995-1997)
- Cairo University undergraduate Award (1985-1990)

TEACHING EXPREIENCE

Senior Lecturer (ETA)

June. 2019- now, CIISE, Concordia University, Quebec, Canada.

Lecturer (ETA)

June 2016- June 2019, CIISE, Concordia University, Quebec, Canada

Lecturer (LTA)

Aug. 2013- May 2016, CIISE, Concordia University, Quebec, Canada.

Courses taught (or being taught) at Concordia

INSE 6110: Foundations of Cryptography (Fall 2013, Winter 2014, Winter 2015, Winter 2016, Winter 2018, Fall 2018, Winter 2019, Fall 2019, Winter 2020, Fall 2020, Winter 2021, Fall 2021, Winter 2022, Fall 2022, Fall 2023, Winter 2024)

INSE 6190: Wireless Network Security (Fall 2016, Summer 2016, Fall 2016, Winter 2017, Summer 2017, Fall 2017, Summer 2018, Fall 2018, Fall 2019, Winter 2020, Summer 2020, Winter 2021, Summer 2021, Winter 2022, Summer 2022, Summer 2023)

INSE 6230: Total Quality Project Management (Winter 2014, Winter 2015 and Summer 2015)

INSE 6270: Quality-Based Systems Engineering (Winter 2014, Summer 2014, Fall 2014 and Fall 2015, Fall 2016, Winter 2017, Fall 2017, Winter 2018, Winter 2019, Winter 2020)

INSE 6280: Quality Assurance for Systems Engineering (Fall 2013, Fall 2014, Winter 2015, Fall 2015 and Winter 2016, Fall 2016, Winter 2017, Fall 2017, Winter 2018, Fall 2018, Winter 2019, Fall 2019, Fall 2020, Fall 2021, Fall 2022, Fall 2023)

INSE 6400: Principles of Systems Engineering (Fall 2013, Fall 2014 and Winter 2016, Fall 2021).

I

NSE 6961: Graduate Seminar in Information & Systems Engineering (Fall 2020, Winter 2021, Summer 2021, Fall 2021, Winter 2022, Summer 2022, Fall 2022, Winter 2023, Fall 2023, Winter 2024).

Before joining CIISE at Concordia

Sept. 2006 - Sept. 2008, Teaching Assistant, Concordia University, Canada.

Sept. 1995 - August 1997, Teaching Assistant, Queen's University, Kingston, Ontario.

Responsibilities

- Prepare course materials and presentations
- Attend tutorials, labs, and substitute lecturers.

SERVICES

- CIISE M.Eng. Graduate Program Director June 2020 – now
- QSE Co-op program director September 2019- June 2021
- Judge in Engineering & Commerce Case Competition (ENGCOMM) (January 2020, October 2020, January 2021, January 2022)
- Member of the Council of the School of Graduate Studies Fall 2020- Summer 2021.
- Member of post-COVID University Education/Life (Jan.2021- May 2021) meeting every two weeks.
- Member of panelist for GirlSET event, Women in Engineering, Summer 2022.

I also served of the following committees:

- CIISE Graduate Curriculum Committee
- CIISE Admissions Committee
- CIISE Awards Committee
- CIISE Supervision Committee
- CIISE Teaching and Learning Committee
- CIISE Recruitment Committee
- Gina Cody Selection Committee for Teaching Excellence Awards (2018-2019) and (2019-2020)

RESEARCH EXPREICEE

Nov. 2008 – Oct. 2009, *Postdoctoral Fellow, Concordia University, Montreal, Quebec*

Sept. 2004 – Sept. 2008, *Research Assistance, Concordia University, Montreal, Quebec*

Responsibilities

- Conduct research in the area of resource management for wireless data networks
- Review related literature, and industrial standards
- Propose and evaluate new solutions through analytical modeling and simulation (Using C++ O.O.P)

Sept. 1995 - Dec. 1997, *Queen's University, Kingston, Ontario.*

Responsibilities

- Conduct research in the area wireless networks security
- Develop a Petri-net based tool for automatic verification of wireless security protocols (Using C++ O.O.P)

THESIS AND PUBLICATIONS

A. Basyouni, "***Analysis of Wireless Cryptographic Protocols.***" M.Sc. Eng. Thesis, Queen's University, 1997.

Ayda Basyouni, "***Resource Management for Cross Layered Star and Mesh Networks.***" P.hD. Thesis, Concordia University, 2008

Journal Papers:

- Ayda Basyouni, Walaa Hamouda and Amr M. Youssef, "***Cooperative Relaying Protocol for Energy-constrained Ad-hoc Networks,***" *IET (formerly IEE) Proceedings-Communications, Vol 5, Issue 4, Page(s): 418 – 424, 2011.*
- Ayda Basyouni, Walaa Hamouda and Amr M. Youssef, "***Improved Channel Access Protocol for Cooperative Ad-Hoc Networks,***" *IET (formerly IEE) Proceedings-Communications, vol. 3, no. 7, pp. 915-923, Aug. 2010.*
- Ayda Basyouni, Anjali Agarwal, and Ahmed Elhakeem, "***An Analytical Model for Reverse Data Channel Scheduling Techniques in cdma2000 1xEV-DO,***" *Journal of Wireless Communications and Mobile*

Computing, Volume 9, Issue 1, January 2009, Pages: 61-70.

- Ayda Basyouni, Anjali Agarwal, and Ahmed Elhakeem, **“Performance Analysis of the cdma2000 Reverse Packet Data Channel,”** International Journal of Communication Networks and Distributed Systems, Volume 2, Issue 2/3, 2009, Pages: 160-180.
- Ayda Basyouni, Ahmed Elhakeem, and Anjali Agarwal, **“Efficient Resource Management for Packet Mode cdma2000,”** European Transactions on Telecommunications, Volume 20, Issue 1, January 2009, Pages: 203-215.

Conference Papers:

- Ayda Basyouni, Walaa Hamouda and Amr M. Youssef, **“A New Rate Control Technique for cdma2000 1xEV,”** IEEE Global Telecommunications Conference (GLOBECOM 2010), Miami, Florida, Dec. 2010.
- Ayda Basyouni, Walaa Hamouda and Amr M. Youssef, **“On Reducing Blocking Probability in Cooperative Ad-hoc Networks,”** IEEE Global Telecommunications Conference (GLOBECOM 2009), Hawaii, Nov. 2009.
- Ayda Basyouni, Anjali Agarwal, and Ahmed Elhakeem, **“A Slot Allocation Technique for WiMAX Backhaul Networks.”** 24th Queen's Biennial Symposium on Communications, June, 2008, Kingston Canada.
- Ayda Basyouni, Anjali Agarwal, and Ahmed Elhakeem, **“Performance Analysis of cdma2000 Reverse Packet Data Channel,”** Proc. of the Second International Conference on Access Networks (ACCESSNETS 2007), Ottawa Canada
- Ayda Basyouni, Ahmed Elhakeem, and Anjali Agarwal, **“Maximizing the Reverse Link Throughput for cdma2000 1xEV-DO Using Particle Swarm Optimization,”** Proc. of the Seventh International Conferences on Wireless and Optical Communications (WOC 2007), Montreal Canada

- Ayda Basyouni, Ahmed Elhakeem, and Anjali Agarwal, "**A dynamic scheduling scheme for the reverse packet data channel in cdma2000 1xEV-DV**," Proc. of the IEEE Canadian conference in Electrical and Computer Engineering, CCECE'2006, Ottawa, Canada, May 2006

- Ayda Basyouni, Ahmed Elhakeem, and Anjali Agarwal, "**On Rate Assignment Schemes for the Reverse Packet Data Channel in cdma2000 1xEV-DV**," Proc. of the 64th IEEE Vehicular Technology conference, VTC 2006, September 2006

- A. Basyouni and S. Tavares "**New Approach to Cryptographic Protocol Analysis using Coloured Petri Nets.**" Proceeding of the Canadian Conference on Electrical and Computer Engineering (CCECE'97), May 1997

- A. Basyouni and S. Tavares "**Public Key versus Private Key in Wireless Authentication Protocols.**" Proceeding of the Canadian Workshop on Information Theory, June 1997

WORKING EXPREIENCE

Software Developer

Dec. 1990 - Oct. 1993, Arabic Information Systems (INFO ARAB), Cairo, Egypt, R&D department, Macintosh development section

Responsibilities

I was part of the team that developed the first Arabic language spell and grammar checker; currently used within several applications by licensing. Throughout this project I worked as software developer, analyst, and designer. I lead the project development team from January 1992- October 1993

Computer instructor

Sep. 1990 - Dec. 1990, The "Wissam" company for electronics design and manufacturing, Cairo, Egypt.



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Dr. Abdessamad Ben Hamza

Correspondence language: English

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The primary information is denoted by (*)

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Primary Affiliation (*)

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Dr. Abdessamad Ben Hamza

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes
Spanish; Castilian	Yes	Yes	Yes	Yes	Yes

Degrees

- 2004/8 Post-doctorate, Electrical and Computer Engineering, Duke University
- 2003/12 Doctorate, Electrical and Computer Engineering, North Carolina State University
- 2001/2 Research Associate, Electrical and Computer Engineering, North Carolina State University
- 1997/11 Master's Thesis, Applied Mathematics, Universidad de Granada
- 1993/6 Bachelor's, Mathematics, University of Tetouan, Morocco

Recognitions

- 2022/1 Outstanding Reviewer Award for IEEE Transactions on Multimedia
IEEE
Prize / Award
IEEE

User Profile

Research Specialization Keywords: Computer vision, Deep Learning, Geometry processing, Image processing, Machine Learning

Employment

- 2016/6 Professor
Concordia Institute for Information Systems Engineering, Concordia University
Full-time, Professor
Tenure Status: Tenure

- 2018/6 - 2023/5
 Department Chair
 Concordia Institute for Information Systems Engineering, Concordia University
 Full-time, Professor
 Tenure Status: Tenure
 During my tenure as chair for the 5-year term, my responsibilities encompassed a range of crucial tasks. These include offering both academic and administrative guidance, spearheading the implementation of strategic academic plans to enhance and uphold the standard of teaching and research within the Department. Another key aspect of my role involved taking the lead in recruiting faculty and staff members, ensuring the selection of individuals who align with our department's vision. I also conducted comprehensive evaluations of faculty performance, fostering an environment of continuous improvement.
- 2014/6 - 2016/5
 Associate Department Chair
 Concordia Institute for Information Systems Engineering, Concordia University
 Full-time, Associate Professor
 Tenure Status: Tenure
 Assist and advise the Department Chair on all matters of substance, including course assignments and course releases, and also prepare the departmental schedule of classes for fall, spring and summer sessions.
- 2009/6 - 2016/5
 Associate Professor
 Concordia Institute for Information Systems Engineering, Concordia University
 Full-time, Associate Professor
 Tenure Status: Tenure
- 2013/6 - 2014/5
 Graduate Program Director
 Concordia Institute for Information Systems Engineering, Concordia University
 Full-time, Associate Professor
 Tenure Status: Tenure
 Recruit and facilitate the admission of graduate students; respond to inquiries from prospective applicants; work with graduate faculty to develop curriculum and courses.
- 2009/6 - 2011/5
 Graduate Program Director
 Concordia Institute for Information Systems Engineering, Concordia University
 Full-time, Associate Professor
 Tenure Status: Tenure
 Recruit and facilitate the admission of graduate students; respond to inquiries from prospective applicants; work with graduate faculty to develop curriculum and courses.
- 2004/9 - 2009/5
 Assistant Professor
 Concordia Institute for Information Systems Engineering, Concordia University
 Full-time, Assistant Professor
 Tenure Status: Tenure Track

Research Funding History

Awarded [n=4]

- 2024/2 - 2027/1
 Co-investigator
 A Universal AI-Powered IoT Platform for Smart Buildings: Data-Driven Insights with Privacy Focus, Grant
Funding Sources:
 Concordia's Volt-Age applied research program
 Total Funding - 200,000
 Portion of Funding Received - 66,666
 Funding Competitive?: Yes
- 2023/4 - 2026/3
 Automatic Identification of Extremist Content on the Web, Grant

Co-investigator	<p>Funding Sources: Fonds de recherche du Québec - Nature et technologies (FRQNT) Projet de recherche en équipe Total Funding - 150,000 Portion of Funding Received - 50,000 Funding Competitive?: Yes</p> <p>Co-investigator : Omar Abdelwahab; Principal Investigator : Nizar Bouguila</p>
2018/4 - 2024/3 Principal Investigator	<p>Learning graph representations for intelligent visual computing, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) NSERC Discovery Total Funding - 168,000 Portion of Funding Received - 168,000 Funding Competitive?: Yes</p>
2020/9 - 2022/8 Principal Applicant	<p>Using semi-supervised learning for classification of sport images, Fellowship</p> <p>Funding Sources: Mitacs Mitacs Accelerate Total Funding - 60,000 Portion of Funding Received - 60,000 Funding Competitive?: Yes</p>

Student/Postdoctoral Supervision

Master's Thesis [n=10]

2024/1 - 2025/12 Principal Supervisor	<p>Zahidul Hasan (In Progress) , Concordia University Thesis/Project Title: Transformer-Based Models for 3D Human Motion Prediction Present Position: Research Assistant</p>
2024/1 - 2025/12 Principal Supervisor	<p>Ryan Amstutz (In Progress) , Concordia University Thesis/Project Title: Spatio-Temporal Methods for 3D Human Motion Prediction Present Position: Research Assistant</p>
2023/9 - 2025/8 Principal Supervisor	<p>Abu Taib Mohammed Shahjahan (In Progress) , Concordia University Thesis/Project Title: Robust Approaches to 3D Human Pose Estimation and Motion Prediction Present Position: Research Assistant</p>
2022/9 - 2024/4 Principal Supervisor	<p>Shakib Khan (In Progress) , Concordia University Thesis/Project Title: Graph representation learning for anomaly detection Present Position: Graduate Student, Concordia University</p>
2021/9 - 2023/8 Principal Supervisor	<p>Zaedul Islam (Completed) , Concordia University Thesis/Project Title: Iterative graph filtering networks for 3D human pose estimation Present Position: Software Developer, Plusgrade</p>
2021/1 - 2023/4 Principal Supervisor	<p>Tanvir Hassan (Completed) , Concordia University Thesis/Project Title: Graph neural networks for 3D human pose estimation Present Position: Software Developer, 123Loadboard</p>

2019/9 - 2021/7 Principal Supervisor	Hasib Zunair (Completed) , Concordia University Thesis/Project Title: Designing efficient deep learning models for computer-aided medical diagnosis Present Position: PhD student, Concordia University
2019/6 - 2021/8 Principal Supervisor	Min Wen (Completed) , Concordia University Thesis/Project Title: Towards adaptive federated semi-supervised learning for visual recognition Present Position: Data Engineer, Deloitte
2019/6 - 2021/7 Principal Supervisor	Jianning Quan (Completed) , Concordia University Thesis/Project Title: Pose estimation and object detection using deep convolutional networks Present Position: Machine Learning Engineer, Extend AI
2018/9 - 2020/12 Principal Supervisor	Mahsa Rezaei (Completed) , Concordia University Thesis/Project Title: Learning shape-aware representations for object recognition Present Position: Chief Operating Officer, Technologie Majic3D Inc.
Doctorate [n=8]	
2022/9 - 2027/12 Principal Supervisor	Dalia Alzubi (In Progress) , Concordia University Thesis/Project Title: Transformer Models for Medical Image Segmentation Present Position: Research Assistant
2021/9 - 2024/12 Principal Supervisor	Hasib Zunair (In Progress) , Concordia University Thesis/Project Title: Masked supervised learning Present Position: Research Assistant, Concordia University
2018/1 - 2023/12 Principal Supervisor	Mahsa Mesgaran (Completed) , Concordia University Thesis/Project Title: Graph neural networks for semi-supervised learning and anomaly detection Present Position: Machine Learning Engineer, Cash App
2018/1 - 2024/8 Principal Supervisor	Raed Abdel Sater (In Progress) , Concordia University Thesis/Project Title: Multitask federated learning Present Position: Data science manager, Techo-Bloc, Montreal
2015/9 - 2022/6 Principal Supervisor	Ibrahim Salim (Completed) , Concordia University Thesis/Project Title: Pediatric bone age analysis and brain disease prediction for computer-aided diagnosis Present Position: Assistant Professor, Libya
2015/9 - 2018/9 Principal Supervisor	Lorenzo Luciano (Completed) , Concordia University Thesis/Project Title: Geometric deep learned descriptors for 3D shape recognition Present Position: Senior ML Applied Scientist, Amazon, San Diego, California
2014/6 - 2017/10 Principal Supervisor	Hamed Ghodrati (Completed) , Concordia University Thesis/Project Title: Deep shape representations for deformable 3D object recognition Present Position: Industrial Researcher, Computer Research Institute of Montreal (CRIM)
2014/1 - 2017/6 Principal Supervisor	Majid Masoumi (Completed) , Concordia University Thesis/Project Title: Feature encoding of spectral descriptors for 3D shape recognition Present Position: Director of Innovation and Technology AI Project Lead, Boeuf Québec SPEQ

Event Administration

- 2022/6 - 2022/9 Area Chair, 10th International Conference on 3D Vision (3DV). I monitored and managed the review process for several papers, facilitated discussion after rebuttal, wrote meta-reviews and made acceptance recommendations, Conference, 2022/9 - 2022/9
- 2021/7 - 2021/12 Area Chair, 9th International Conference on 3D Vision (3DV). I monitored and managed the review process for several papers, facilitated discussion after rebuttal, wrote meta-reviews and made acceptance recommendations, Conference, 2021/12 - 2021/12

Editorial Activities

- 2023/9 - 2028/8 Associate Editor, Artificial Intelligence in Health, Journal
- 2022/8 - 2027/7 Associate Editor, Journal of Modern Medical Imaging, Journal
- 2018/1 - 2024/12 Associate Editor, Journal of Machine Intelligence and Data Science, Journal
- 2024/10 - 2024/10 Committee Member, European Conference on Artificial Intelligence (ECAI), Conference Abstract
- 2024/6 - 2024/6 Committee Member, IEEE Workshop on Perception Beyond the Visible Spectrum in Conjunction with CVPR 2024, Conference Abstract
- 2023/6 - 2023/6 Committee Member, IEEE Workshop on Perception Beyond the Visible Spectrum in Conjunction with CVPR 2023, Conference Abstract
- 2023/4 - 2023/4 Committee Member, International Conference on Image Processing and Vision Engineering, IMPROVE, Conference Abstract
- 2022/4 - 2022/4 Committee Member, Committee Member, International Conference on Image Processing and Vision Engineering, IMPROVE, Conference Abstract
- 2022/3 - 2022/3 Committee Member, 9th International Conference on Modeling, Simulation and Applied Optimization, SIAM, Conference Abstract
- 2021/4 - 2021/4 Committee Member, International Conference on Image Processing and Vision Engineering, IMPROVE, Conference Abstract
- 2018/11 - 2018/11 Committee Member, 9th IEEE Annual Ubiquitous Computing, Electronics and Mobile Communication Conference, IEEE, Conference Abstract
- 2018/6 - 2018/6 Committee Member, International Conference on Learning and Optimization Algorithms, OPAL, Conference Abstract
- 2018/4 - 2018/4 Committee Member, 11th Eurographics Workshop on 3D Object Retrieval, Eurographics, Conference Abstract

Organizational Review Activities

- 2018/12 - 2023/1 Reviewer, Natural Sciences and Engineering Research Council of Canada (NSERC) Review Discovery and CRD Grant Proposals

Committee Memberships

- 2018/6 - 2023/5 Committee Member, Department Hiring Committee, Concordia University
- 2018/6 - 2023/5 Committee Member, Department Tenure Committee, Concordia University

2018/6 - 2023/5	Ex-Officio, Gina Cody School of Engineering and Computer Science Council, Concordia University
2018/6 - 2023/5	Ex-Officio, Gina Cody School of Engineering and Computer Science Executive Committee, Concordia University
2018/6 - 2023/5	Committee Member, Department Research Committee, Concordia University
2018/6 - 2018/5	Committee Member, Department Personnel Committee, Concordia University

Other Memberships

2009/3	Senior Member, IEEE
2009/3	Member, Professional Engineers Ontario

Presentations

- (2023). Exploring Deep Learning: Autoencoders and Generative Models. International Conference on Intelligent Systems and Smart Technologies, Settat, Morocco
Invited?: Yes, Keynote?: Yes
- (2022). Deep learning with autoencoders and generative models. 5th International Conference on Intelligent Systems and Computer Vision, Fez, Morocco
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes

Publications

Journal Articles

- Osama Alshareet and A. Ben Hamza. (2024). Adaptive spectral graph wavelets for collaborative filtering. Pattern Analysis and Applications.
Published
Refereed?: Yes, Open Access?: No
- Ibrahim Salim and A. Ben Hamza. (2024). Classification of developmental and brain disorders via graph convolutional aggregation. Cognitive Computation.
Published
Refereed?: Yes, Open Access?: No
- Zaedul Islam* and A. Ben Hama. (2023). Iterative graph filtering network for 3D human pose estimation. Journal of Visual Communication and Image Representation.
Published
Refereed?: Yes
- Ibrahim Salim and A. Ben Hamza. (2023). Classification of developmental and brain disorders via graph convolutional aggregation. Cognitive Computation.
Accepted
Refereed?: Yes, Open Access?: No
- Tanvir Hassan* and A. Ben Hamza. (2023). Regular splitting graph network for 3D human pose estimation. IEEE Transactions on Image Processing.
Published
Refereed?: Yes

6. Mahsa Mesgaran* and A. Ben Hamza. (2023). Graph fairing convolutional networks for anomaly detection. Pattern Recognition.
Published
Refereed?: Yes
7. Mahsa Mesgaran* and A. Ben Hamza. (2023). A graph encoder-decoder network for unsupervised anomaly detection. Neural Computing and Applications.
Published
Refereed?: Yes
8. Ruchika Verma et al. (2021). MoNuSAC2020: A Multi-organ nuclei segmentation and classification challenge. IEEE Transactions on Medical Imaging.
Published
Refereed?: Yes
9. L. Luciano*, I. Kiss, P.W. Beardshear, E. Kadosh, and A. Ben Hamza. (2021). WISE: a computer system performance index scoring framework. Journal of Cloud Computing.
Published
Refereed?: Yes, Open Access?: Yes
10. H. Zunair* and A. Ben Hamza. (2021). Synthesis of COVID-19 chest X-rays using unpaired image-to-image translation. Social Network Analysis and Mining.
Published
Refereed?: Yes
11. Raed Abdel Sater* and A. Ben Hamza. (2021). A federated learning approach to anomaly detection in smart buildings. ACM Transactions on Internet of Things.
Published
Refereed?: Yes
12. I. Salim* and A. Ben Hamza. (2021). Ridge regression neural network for pediatric bone age assessment. Multimedia Tools and Applications.
Published
Refereed?: Yes
13. Hasib Zunair* and A. Ben Hamza. (2021). Sharp U-Net: Depthwise convolutional network for biomedical image segmentation. Computers in Biology and Medicine.
Published
Refereed?: Yes
14. M. Mesgaran* and A. Ben Hamza. (2021). Anisotropic graph convolutional network for semi-supervised learning. IEEE Transactions on Multimedia.
In Press
Refereed?: Yes
15. H. Zunair* and A. Ben Hamza. (2020). Melanoma detection using adversarial training and deep transfer learning. Physics in Medicine & Biology. 65(13)
Published
Refereed?: Yes
16. L. Luciano* and A. Ben Hamza. (2019). Deep similarity network fusion for 3D shape classification. The Visual Computer.
Published
Refereed?: Yes
17. L. Luciano* and A. Ben Hamza. (2019). A global geometric framework for 3D shape retrieval using deep learning. Computers & Graphics.
Published
Refereed?: Yes

18. H. Ghodrati*, L. Luciano*, A. Ben Hamza. (2019). Convolutional shape-aware representation for 3D object classification. *Neural Processing Letters*.
Published
Refereed?: Yes
19. M. Masoumi*, M. Rezaei* and A. Ben Hamza. (2018). Global spectral graph wavelet signature for surface analysis of carpal bones. *Physics in Medicine & Biology*.
Published
Refereed?: Yes
20. I. Salim* and A. Ben Hamza,. (2018). Fast feature-preserving approach to carpal bone surface denoising. *Sensors*.
Published
Refereed?: Yes, Open Access?: Yes

Book Chapters

1. M. Masoumi*, M. Rezaei*, and A. Ben Hamza. (2019). Shape analysis of carpal bones using spectral graph wavelets. *Vertex-Frequency Analysis of Graph Signals*. : 419-436.
Published, Springer
Refereed?: Yes

Conference Publications

1. Hasib Zunair and A. Ben Hamza. (2024). Learning to recognize occluded and small objects with partial inputs. *Proc. IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*,
Paper
Published
Refereed?: Yes, Invited?: No
2. Tanvir Hassan* and A. Ben Hamza. (2023). Spatio-temporal MLP-graph network for 3D human pose estimation. *34rd British Machine Vision Conference (BMVC)*,
Conference Date: 2023/11
Paper
Accepted
Refereed?: Yes, Invited?: No
3. H. Zunair* and A. Ben Hamza. (2022). Masked supervised learning for semantic segmentation. *33rd British Machine Vision Conference (BMVC)*, United Kingdom
Conference Date: 2022/11
Paper
Published
Refereed?: Yes, Invited?: No
4. H. Zunair*, Y. Gobeil, S. Mercier, and A. Ben Hamza. (2022). Fill in fabrics: Body-aware self-supervised inpainting for image-based virtual try-on. *33rd British Machine Vision Conference (BMVC)*, United Kingdom
Conference Date: 2022/11
Paper
Published
Refereed?: Yes, Invited?: No
5. Jianning Quan* and A. Ben Hamza. (2021). Higher-order implicit fairing networks for 3D human pose estimation. *32nd British Machine Vision Conference (BMVC)*, United Kingdom
Conference Date: 2021/11
Paper
Published
Refereed?: Yes, Invited?: No

6. Hasib Zunair*, Yan Gobeil, Samuel Mercier, A Ben Hamza. (2021). STAR: Noisy Semi-supervised transfer learning for visual classification. ACM Multimedia Conference. International Workshop on Multimedia Content Analysis in Sports, China
Conference Date: 2021/10
Paper
Published
Refereed?: Yes, Invited?: No
7. H. Zunair* and A. Ben Hamza. (2021). Synthetic COVID-19 chest X-ray dataset for computer-aided diagnosis. Proc. International Conference on Machine Learning (ICML) Workshop on Computational Biology,
Conference Date: 2021/7
Paper
Published
Refereed?: Yes, Invited?: No
8. L. Luciano* and A. Ben Hamza,. (2018). Geodesic-based 3D shape retrieval using sparse autoencoders. Euro-graphics workshop on 3D Object Retrieval,
Paper
Published
Refereed?: Yes, Invited?: No



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Dr. Nizar Bouguila

Correspondence language: English

Contact Information

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Address

Courier (*)

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Dr. Nizar Bouguila

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes

Degrees

- 2006/4 Doctorate, Computer Science, Université de Sherbrooke
Supervisors: Ziou, Djemel, 2003/1 - 2006/4
- 2002/12 Master's Thesis, Computer Science, Université de Sherbrooke
Supervisors: Vaillancourt, Jean, 2001/1 - 2002/12; Ziou, Djemel, 2001/1 - 2002/12
- 2000/6 Bachelor's, Computer Engineering, Université de Tunis

Recognitions

- 2023/6 - 2028/5 Concordia University Research Chair Tier 1 in Applied AI
Concordia University
Distinction
This distinction is awarded, based on research record, via internal competition at the level of the faculty and then at the level of the university.
- 2023/1 Gina Cody Research and Innovation Fellow - 45,000
Concordia University
Distinction
Gina Cody School of Engineering and Computer Science, Concordia University
- 2022/8 Best paper presentation award, IEEE ICIT 2022
IEEE International Conference on Industrial Technology
Prize / Award
Best paper presentation award with my students K. Ketabchi and N. Manouchehri, 23rd IEEE International Conference on Industrial Technology (IEEE ICIT 2022), "Fully Bayesian Libby-Novick Beta Mixture Model with Feature Selection", August 2022.
- 2022/7 Best paper award, IEA/AIE 2022
International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Syst
Prize / Award
Best paper award with my student Jiaxun Guo, Dr. Manar Amayri and Prof. Wentao Fan, 35th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2022), "A Generalized Inverted Dirichlet Predictive Model for Activity Recognition using Small Data"

- 2021/8 Best student paper award, IEEE IRI 2021
IEEE
Prize / Award
Best student paper award with my students Zixiang Xian and Muhammad Azam, 22nd IEEE International Conference on Information Reuse and Integration for Data Science (IRI 2021), "Statistical Modeling using Bounded Asymmetric Gaussian Mixtures: Application to Human Action and Gender Recognition"
- 2021/5 Best poster award, FLAIRS-34
FLAIRS
Prize / Award
Best poster award with my students Xuanbo Su and Nuha Zamzami, 34rd International Conference of the Florida Artificial Intelligence Research Society (FLAIRS-34), "Covid-19 News Clustering using MCMC-Based learning of Finite EMSD Mixture Models"
- 2020/6 - 2021/5 Concordia University Research Fellow - 5,000
Concordia University
Distinction
Concordia University Research Fellow for the Award in Category B – for researchers who are working toward facilitating and building upon their track record of research excellence, leadership, productivity and influence.
- 2019/8 Best paper award, IRI 2019
IEEE
Prize / Award
Best paper award with my students Hieu Nguyen, Meeta Kalra, and Muhammad Azam, 20th IEEE International Conference on Information Reuse and Integration for Data Science (IRI2019), "Data Clustering using Online Variational Learning of Finite Scaled Dirichlet Mixture Models"
- 2018/6 Best paper award, IEA/AIE 2018
International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Syst
Prize / Award
Best paper award with my student Nuha Zamzami, 31st International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2018), "Text modeling Using Multinomial Scaled Dirichlet Distributions"
- 2017/6 - 2019/5 Concordia University Research Chair Tier 2
Concordia University
Distinction
This distinction is awarded, based on research record, via internal competition at the level of the faculty and then at the level of the university.
- 2017/5 Teaching award
Concordia University
Prize / Award
CIISE teaching excellence award.

User Profile

Research Specialization Keywords: Data mining, data analysis, statistics, machine learning, pattern recognition, computer vision, image processing, Health informatics, smart buildings

Employment

2021/9	<p>Founding Director of the Concordia Applied AI Institute Concordia Applied AI Institute, Concordia University Full-time Tenure Status: Non Tenure Track</p>
2018/6	<p>Founder & Director of the Explainable AI (XAI) Lab Explainable AI Lab, Concordia University Full-time Tenure Status: Non Tenure Track</p>
2016/6	<p>Professor CIISE, Engineering and Computer Science, Concordia University Full-time Tenure Status: Tenure</p>
2010/6 - 2016/5	<p>Associate Professor CIISE, Engineering and Computer Science, Concordia University Full-time Tenure Status: Tenure</p>
2006/6 - 2010/5	<p>Assistant Professor CIISE, Engineering and Computer Science, Concordia University Full-time Tenure Status: Tenure Track</p>
2006/1 - 2006/4	<p>Lecturer Administration, Université de Sherbrooke Part-time Tenure Status: Non Tenure Track</p>
2001/4 - 2006/4	<p>Teaching assistant Mathématiques-informatique, Sherbrooke University, Université de Sherbrooke Part-time Tenure Status: Non Tenure Track</p>
2001/1 - 2006/4	<p>Research assistant Mathématiques-informatique, Sherbrooke University, Université de Sherbrooke Full-time Tenure Status: Non Tenure Track</p>
2005/12 - 2006/2	<p>Statistical Analyst Géomatique, Environment Canada</p>
2005/9 - 2005/12	<p>Lecturer Computer Science, Bishop's University, Bishop's University Part-time Tenure Status: Non Tenure Track</p>
2000/2 - 2000/7	<p>Intern Informatique, Grenoble Institute of Technology, Institut national polytechnique de Grenoble Part-time Tenure Status: Non Tenure Track</p>

Research Funding History

Awarded [n=8]

2023/4 - 2028/3
Principal Investigator A unified framework for interactive explainable unsupervised learning and unsupervised model adaptation: Application to multimodal activity recognition, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery

Total Funding - 230,000

Funding Competitive?: Yes

2022/4 - 2027/3
Co-applicant Assessing the usability and acceptability of iCANPlate, a mobile dietary self-monitoring tool that aligns with Canada's food guide: a multi-methods study, Grant

Funding Sources:

Canadian Institutes of Health Research (CIHR)

Total Funding - 378,675

Funding Competitive?: Yes

Co-applicant : A. Alberga; Jean-Philippe Gouin; L. Kakinami; R. Rhodes;

Principal Investigator : Tamara Cohen

2023/4 - 2026/3
Principal Investigator Automatic identification of extremist content on the Web, Grant

Funding Sources:

Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT)

Team Research Project

Total Funding - 150,000

Funding Competitive?: Yes

Co-applicant : A. Ben Hamza

2023/1 - 2025/12
Principal Investigator AI for Historical Tourism, Grant

Funding Sources:

Concordia University

Gina Cody Research and Innovation Fellowship

Total Funding - 45,000

Funding Competitive?: Yes

2020/8 - 2025/7
Co-investigator Micro Transit Demand Management (microTDM) with Big Data and Artificial Intelligence, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 2,326,666

Funding Competitive?: Yes

Co-applicant : Owen Waygood;

Principal Investigator : Zachary Patterson

2023/1 - 2024/12
Co-applicant Explainable Interactive Unsupervised Learning for Smart Buildings, Grant

Funding Sources:

Concordia University

AI2 Funding program

Total Funding - 8,000

Funding Competitive?: Yes

Principal Investigator : Manar Amayri

2022/9 - 2024/8

Principal Investigator

Personalized Conversational Agents for Historical Tourism, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 180,000

Funding Competitive?: Yes

2023/4 - 2024/3

Co-applicant

The impact of Indirect Flexibility of Electric Vehicles Drivers Behavior to Support Decarbonization Solutions, Grant

Funding Sources:

Concordia University

Concordia Sustainable Transitions Team Research Initiative

Total Funding - 20,000

Funding Competitive?: Yes

Co-applicant : Ursula Eicker;

Principal Investigator : Manar Amayri

Completed [n=28]

2022/4 - 2024/3

Principal Investigator

An Artificial Intelligence Platform to Support Self-Consumption in a Residential Context, Grant

Funding Sources:

Concordia University

Concordia Seed Funding (Individual)

Total Funding - 10,000

Portion of Funding Received - 10,000

Funding Competitive?: Yes

2021/9 - 2023/8

Principal Investigator

Development of an Automatic Recruitment System using Machine Learning Techniques, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 304,000

Portion of Funding Received - 304,000

Funding Competitive?: Yes

2022/3 - 2023/6

Co-applicant

Harnessing Screen Content for the Well-Being of Long Term Care Residents: A Human Expertise/Artificial Intelligence Endeavour to Counteract COVID Related Social Isolation, Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

New Frontiers in Research Fund (NFRF)

Total Funding - 250,000

Portion of Funding Received - 40,000

Funding Competitive?: Yes

Co-applicant : Marta Kersten;

Co-investigator : Santiago Hidalgo;

Collaborator : Adriana Lacerda; Caroline Ménard; Habib Benali; Najmeh Khalili-Mahani; Pierre Rainville;

Principal Investigator : Ana Inés Ansaldo

2020/7 - 2023/5
Principal Investigator Improve Workplace Wellbeing using AI and Organizational Behavior Software Platform,
Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 133,333

Portion of Funding Received - 133,333

Funding Competitive?: Yes

2021/5 - 2023/4
Principal Investigator Advanced AI for Demand Forecast, Assortment Planning and Plan Monitoring in Fashion
and Apparel Retailing, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 801,666

Funding Competitive?: Yes

2017/4 - 2023/3
Principal Investigator Time-sensitive non-parametric Bayesian approaches for event modeling, recognition and
prediction, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery

Total Funding - 128,000

Portion of Funding Received - 128,000

Funding Competitive?: Yes

2022/3 - 2022/10
Co-applicant Developing a New Workflow for Occupancy Estimation using Wi-Fi Sensing for Building
Energy Simulation, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 30,000

Portion of Funding Received - 15,000

Funding Competitive?: Yes

Principal Investigator : Ursula Eicker

2020/1 - 2022/10
Co-applicant Joule M&V AI, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 160,000

Portion of Funding Received - 40,000

Funding Competitive?: Yes

Co-applicant : F. Haghighat; H. Rivaz;

Principal Investigator : Fuzhan Nasiri

2022/6 - 2022/9
Principal Investigator ML-Based Video Timewraps, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

MITACS Accelerate Assessment

Total Funding - 12,000

Portion of Funding Received - 12,000

	Funding Competitive?: Yes
2021/9 - 2022/8 Principal Investigator	Optimizing Return on Investment using Artificial Intelligence: A Recommendation System- Based Solution, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 93,333 Portion of Funding Received - 93,333 Funding Competitive?: Yes
2020/4 - 2022/8 Principal Investigator	Analytics on 5G – Topology through PM correlation, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 360,000 Portion of Funding Received - 360,000 Funding Competitive?: Yes
2020/8 - 2022/7 Principal Investigator	Development of a solution to assess the quality and to optimize AI-based video codecs, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 90,000 Portion of Funding Received - 90,000 Funding Competitive?: Yes
2022/1 - 2022/6 Principal Investigator	Testing, Validation and QA of Computer Vision Models & Data Sets in a Novel SAAS Environment, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Mitacs Accelerate Explore Total Funding - 12,000 Portion of Funding Received - 12,000 Funding Competitive?: Yes
2020/9 - 2022/3 Principal Investigator	Development of Conversational Agents and Applications in Playful Environments, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) MITACS Accelerate Assessment Total Funding - 43,250 Portion of Funding Received - 43,250 Funding Competitive?: Yes
2020/4 - 2022/3 Principal Investigator	Machine Learning and Data Mining for Smart Buildings, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 186,666 Portion of Funding Received - 186,666 Funding Competitive?: Yes
2021/4 - 2022/3 Principal Investigator	Artificial Intelligence Infrastructure for Large Scale Multimodal Data Modeling, Grant Funding Sources:

Concordia University
 Concordia Facility Optimization Program
 Total Funding - 30,000
 Portion of Funding Received - 30,000
 Funding Competitive?: Yes

2021/1 - 2021/12
 Principal Investigator

Tagging Audio Files, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 30,000
 Portion of Funding Received - 30,000
 Funding Competitive?: Yes

2020/8 - 2021/6
 Co-investigator

Development of an innovative smartphone application based on the new Canada's food guide, Grant

Funding Sources:

Concordia University
 PERFORM centre Call for Multidisciplinary Research Proposals in Preventive Health
 Total Funding - 30,000
 Portion of Funding Received - 10,000
 Funding Competitive?: Yes

Principal Investigator : Tamara Cohen

2019/4 - 2021/5
 Principal Investigator

Machine Learning and Data Mining Approaches for Smart Buildings, Grant

Funding Sources:

Concordia University
 Concordia Seed Funding
 Total Funding - 7,000
 Portion of Funding Received - 7,000
 Funding Competitive?: Yes

2019/10 - 2021/5
 Co-applicant

Development of an NLP Sales Assistant using Machine Learning Techniques, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 105,000
 Portion of Funding Received - 105,000
 Funding Competitive?: Yes

2020/1 - 2021/5
 Principal Investigator

Energy reduction in HVAC Systems in a Commercial Building Environment using Data-Driven Approaches, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 240,000
 Portion of Funding Received - 240,000
 Funding Competitive?: Yes

2020/9 - 2021/3
 Co-applicant

A web-based dyadic intervention to promote health eating and physical activity among obese older adults couples, Grant

Funding Sources:

Concordia University
 PERFORM centre Call for Multidisciplinary Research Proposals in Preventive Health

Total Funding - 30,000
 Portion of Funding Received - 10,000
 Funding Competitive?: Yes
 Principal Investigator : Jean-Philippe Gouin

2020/9 - 2021/3
 Co-applicant

Multimedia and Artificial Intelligence Platform for Counteracting the Extreme Isolation
 Caused by Pandemic Confinement, Grant

Funding Sources:

Canada Foundation for Innovation (CFI)
 Exceptional Opportunities Fund – COVID-19 (Universities)
 Total Funding - 395,136
 Portion of Funding Received - 1
 Funding Competitive?: Yes

Co-investigator : Hidalgo Santiago;
 Collaborator : Marta Kresten-Oertel; Najmeh Khalil-Mahani;
 Principal Investigator : Ana Inés Ansaldo

2019/3 - 2019/11
 Principal Investigator

Offline Virtual Advertisement Replacement in Sports from Uncalibrated Video, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
 Engage
 Total Funding - 25,000
 Portion of Funding Received - 25,000
 Funding Competitive?: Yes

2019/4 - 2019/9
 Principal Investigator

NLP Sales Assistant, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 15,000
 Portion of Funding Received - 15,000
 Funding Competitive?: Yes

2014/6 - 2019/5
 Principal Investigator

Concordia research Chair Tier 2 (CURC) in Management, Analysis and Modeling of Big
 Multimodal Data and Applications, Research Chair

Funding Sources:

Concordia University
 Concordia research Chair Tier 2 (CURC)
 Total Funding - 100,000
 Portion of Funding Received - 100,000
 Funding Competitive?: Yes

2018/4 - 2018/9
 Principal Investigator

Topology validation, Error detection, and Correction of rooftops 3D models from LiDAR
 point clouds and Photogrammetry, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 15,000
 Portion of Funding Received - 15,000
 Funding Competitive?: Yes

2012/5 - 2017/4
 Principal Investigator

Hybrid generative discriminative learning of dynamic multi-relational models and
 applications, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery Grants - Individual

Total Funding - 140,000

Portion of Funding Received - 140,000

Funding Competitive?: Yes

Student/Postdoctoral Supervision**Bachelor's [n=11]**

- 2023/5 - 2023/8
Principal Supervisor Hamdi Barkous (Completed) , Ecole Polytechnique, Tunisia
Thesis/Project Title: Time series forecasting **Mitacs Globalink (research internship from May 2023 to August 2023)**
Present Position: Undergrad Student
- 2023/5 - 2023/8
Principal Supervisor Prince Raj (Completed) , Indian Institute of Technology, Kharagpur
Thesis/Project Title: Deep Topic Models for Textual and Visual **Mitacs Globalink (research internship from May 2023 to August 2023)**
Present Position: Undergraduate student
- 2023/5 - 2023/8
Principal Supervisor Umang Bagadi (Completed) , G.H. Raisonni College of Engineering(GHRCE), Nagpur
Thesis/Project Title: Natural Language Processing for Sentiment Analysis **Mitacs Globalink (research internship from May 2023 to August 2023)**
Present Position: Undergraduate student
- 2023/5 - 2023/8
Principal Supervisor Aleksander Vinokhodov (Completed) , Concordia University
Thesis/Project Title: Time Series Forecasting for Anomaly Detection **NSERC USRA (research internship from May 2023 to August 2023)**
Present Position: Undergraduate student
- 2021/5 - 2021/8
Principal Supervisor Wassim Nijaoui (Completed) , Concordia University
Thesis/Project Title: Semantic segmentation of videos, **NSERC USRA (research internship from May 2020 to August 2020)**
Present Position: Undergrad Student, Concordia University
- 2021/5 - 2021/8
Principal Supervisor Pragya Gupta (Completed) , National Institute of Technology, Trichy, India
Thesis/Project Title: NLP for Sentiment analysis, **Mitacs Globalink (research internship from May 2021 to August 2021)**
Present Position: Unknown
- 2021/3 - 2021/9
Principal Supervisor Jawher Dridi (Completed) , Ecole Polytechnique, Tunisia
Thesis/Project Title: Transfer learning for activity recognition in smart buildings, **Mitacs Globalink (research internship from March 2021 to July 2021)**
Present Position: Undergrad Student
- 2021/2 - 2021/6
Principal Supervisor Nouha Meftah (Completed) , ENIT, Tunisia
Thesis/Project Title: Emotion Recognition in Social Media (research internship from May 2021 to August 2021)
Present Position: Unknown
- 2019/8 - 2019/5
Principal Supervisor Xiawei Li (Completed) , Sichuan University, China
Thesis/Project Title: Statistical Framework for Color Constancy, **Mitacs Globalink (research internship from May 2020 to August 2020)**
Present Position: Unknown

2019/5 - 2019/8 Principal Supervisor	V. Vishnu (Completed) , National Institute of Technology, Trichy, India Thesis/Project Title: Variational Learning of Hidden Markov Models for Video Anomaly Detection, Mitacs Globalink (research internship from May 2020 to August 2020) Present Position: Unknown
2019/5 - 2019/8 Principal Supervisor	Tiphaine Besnard (Completed) , Universite de Nante, France Thesis/Project Title: Dynamic Texture Modeling (research internship from December 2019 to April 2020) Present Position: Master's student, Université de Nante
Master's non-Thesis [n=10]	
2023/1 - 2023/8 Principal Supervisor	Mohamed Bouzid (Completed) , Concordia University Thesis/Project Title: Load Forecasting using deep learning Present Position: Master's student
2023/1 - 2023/8 Principal Supervisor	Mina Amirpour (Completed) , Concordia University Thesis/Project Title: Cloud-Based Monitoring and Alerting IoT System Present Position: M.Eng Student, Concordia University
2022/5 - 2023/4 Principal Supervisor	Kumar Prabhakaran Saravanakumar (Completed) , Concordia University Thesis/Project Title: Explainable Machine Learning Present Position: Master's student, Concordia University
2022/1 - 2022/6 Principal Supervisor	Kian Ketabchi (Completed) , Concordia University Thesis/Project Title: Bayesian learning of Libby-Novick Beta Models and Feature Selection (research internship from January 2022 to June 2022) Present Position: PhD student, Concordia University
2020/8 - 2021/5 Principal Supervisor	Shahrzad Aminranjbar (Completed) , Concordia University Thesis/Project Title: Facial Expression Recognition using MCMC-Based learning of Finite Exponential Multinomial Scaled Dirichlet Models (research internship from January 2020 to May 2020) Present Position: Data Scientist, Inmind Technologies inc.
2019/1 - 2019/6 Principal Supervisor	Maryam Rahmanpour (Completed) , Concordia University Thesis/Project Title: Variational Entropy-Based Learning of Statistical Models Present Position: PhD student, Georgia Institute of Technology
2019/1 - 2019/4 Principal Supervisor	Maryam Rasti (Completed) , Concordia University Thesis/Project Title: MCMC-Based Learning of Finite Bivariate Mixture Models (research internship from January 2019 to May 2019) Present Position: Data Scientist, Tecsys Inc.
2018/1 - 2018/4 Principal Supervisor	Daria Chernova (Completed) , Concordia University Thesis/Project Title: Control charts for proportional Data (research internship from January 2019 to May 2019) Present Position: QA Analyst Pro Ingredients Inc.
2017/5 - 2017/8 Principal Supervisor	Kawtar Elbekkouri (Completed) , Concordia University Thesis/Project Title: Probabilistic Modeling of Web services (research internship from May 2017 to August 2017) Present Position: Regional Quality Manager- Americas FIME
2017/5 - 2017/8 Principal Supervisor	Yexing Li (Completed) , Concordia University Thesis/Project Title: Crime scene reconstruction (research internship from May 2017 to August 2017) Present Position: Data scientist Alibaba, China

Master's Thesis [n=57]

2022/5 - 2024/4 Principal Supervisor	Oumaima Jouiri (In Progress) , Concordia University Student Degree Expected Date: 2022/4 Thesis/Project Title: Energy consumption and price forecasting Present Position: Master's student
2022/1 - 2023/12 Principal Supervisor	Ahmed Yasser Eita (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Explainable Topic Models Present Position: Master's student
2022/1 - 2023/12 Principal Supervisor	Niloufar Samie (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Libby-Novick Beta Models Present Position: Master's student, Concordia University
2022/1 - 2023/8 Principal Supervisor	Jawher Dridi (Completed) , Concordia University Thesis/Project Title: Unsupervised Domain Adaptation for Estimating Occupancy and recognizing Activities in Smart Buildings Present Position: Research Assistant, Concordia University
2021/9 - 2023/12 Principal Supervisor	Farnaz Kashfinishabouri (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Recommendation Systems Present Position: Master's student, Concordia University
2021/9 - 2023/12 Principal Supervisor	Sahar Salmanzade (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Natural Language Processing Based on Deep Topic Models Present Position: Master's student
2021/9 - 2023/12 Principal Supervisor	Zheng Wang (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Topic models learning using expectation propagation Present Position: Master student
2021/9 - 2023/12 Principal Supervisor	Pardis Ghazi Amin (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Machine learning for Objects Detection Present Position: Master's student, Concordia University
2021/9 - 2024/4 Principal Supervisor	Shadan Ghadimi (In Progress) , Concordia University Student Degree Expected Date: 2024/4 Thesis/Project Title: Explainable Latent Topic Models Present Position: Master's student, Concordia University
2021/9 - 2023/5 Principal Supervisor	Hela Jemaa (Completed) , Concordia University Thesis/Project Title: Orchard Apple Tree Health Assessment using UAV-Based Computer Vision System Present Position: Master's student, Concordia University
2021/9 - 2023/12 Principal Supervisor	Zahra Golpa (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Explainable Machine Learning Present Position: Master's student
2021/9 - 2023/6 Principal Supervisor	Darya Forouzanfar (Completed) , Concordia University Thesis/Project Title: Unsupervised Learning with Feature Selection Based on Multivariate McDonald's Beta Mixture Model for Medical Data Analysis Present Position: Buisness Intelligence Consultant Nectari Software Inc.

2021/9 - 2023/5 Principal Supervisor	Mohammad Kaosain Akbar (Completed) , Concordia University Thesis/Project Title: Non-Intrusive Load Monitoring Using Machine and Deep Learning Methods Present Position: PhD student, Concordia University
2021/1 - 2023/12 Principal Supervisor	Oussama Sghaier (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Anomaly Detection Present Position: Master's student
2021/1 - 2022/12 Principal Supervisor	Fatemeh Rezapour Nikroo (Completed) , Concordia University Thesis/Project Title: Recursive Parameter Estimation of Non-Gaussian Hidden Markov Models for Occupancy Estimation in Smart Buildings Present Position: Machine learning engineer, Synechron Montreal
2021/1 - 2022/12 Co-Supervisor	Sneha Paul (Completed) , Concordia University Thesis/Project Title: An Efficient Neural Network Architecture and Training Protocol for 3D Point Cloud Classification Present Position: PhD student, Concordia University
2021/1 - 2022/12 Principal Supervisor	Zahra Motajabi (Completed) , Concordia University Thesis/Project Title: Deep Learning Methods for Codecs Present Position: Computer Vision Research, AVID Inc., Montreal
2021/1 - 2022/7 Principal Supervisor	Omar Bouhamed (Completed) , Concordia University Thesis/Project Title: AI-Powered Time Series Forecasting Frameworks for Building Energy Management Systems Present Position: Data scientist, Buspass Inc. Montreal
2020/9 - 2022/10 Principal Supervisor	Majid Nikougoftar Nategh (Completed) , Concordia University Thesis/Project Title: Automatic Counting of Mounds on UAV Images using Computer Vision and Machine Learning Present Position: Unknown
2020/9 - 2022/5 Principal Supervisor	Hannah Wood (Completed) , Concordia University Thesis/Project Title: Bidirectional LSTM and Kalman Filter for Passenger Flow Prediction on Bus Transportation Systems Present Position: Cloud Security Engineer, Microsoft
2020/9 - 2023/4 Principal Supervisor	Ahmed Rebei (Completed) , Concordia University Thesis/Project Title: Investigating Hybrid Methods and Transfer Learning for Accurate Load Forecasting Present Position: Data scientist, Unrbanoïd Inc.
2020/9 - 2022/7 Principal Supervisor	Zhiwen Luo (Completed) , Concordia University Thesis/Project Title: Extensions to Cross-Collection Topic Models with Parallel Inference and Differential Privacy using Flexible Priors Present Position: PhD student, Concordia University
2020/9 - 2022/1 Principal Supervisor	Ali Baghdadi (Completed) , Concordia University Thesis/Project Title: Variational Learning Frameworks for Generative Models Based on Hierarchical Dirichlet and Pitman-Yor Processes Present Position: Data Scientist, Buspass Inc. Montreal
2020/9 - 2023/3 Principal Supervisor	Ons Bouarada (Completed) , Concordia University Thesis/Project Title: Generative Models Based on the Bounded Asymmetric Student's t-Distribution Present Position: Data Scientist, Bell Canada

- 2020/8 - 2022/12
Principal Supervisor Xuanbo Su (Completed) , Concordia University
Thesis/Project Title: Fully Bayesian Inference for Finite and Infinite Discrete Exponential Mixture Models
Present Position: Computer vision researcher, Bilibili Inc., China
- 2020/2 - 2021/10
Principal Supervisor Soudabeh Tabarsaii (Completed) , Concordia University
Thesis/Project Title: Non-Intrusive Load Monitoring Using Additive Time Series Modeling via Finite Mixture Models Aggregation
Present Position: Data Scientist, AISTORM Inc. Toronto Canada
- 2020/1 - 2021/8
Principal Supervisor Bingwei Ge (Completed) , Concordia University
Thesis/Project Title: Statistical Framework Based on the Weighted Generalized Gaussian Mixture Model: Application to Robust Point Clouds Registration and Single Target Tracking
Present Position: AI researcher, Shunkun Technology Inc. Beijing, China
- 2020/1 - 2022/4
Co-Supervisor Ghazaleh Torabi (Completed) , Concordia University
Thesis/Project Title: Productivity Monitoring of Construction Workers Based on Spatiotemporal Activity Recognition
Present Position: Computer Vision Engineer, Leav, Montreal
- 2020/1 - 2021/12
Principal Supervisor Samar Hannachi (Completed) , Concordia University
Thesis/Project Title: Statistical Models for Short Text Clustering
Present Position: PhD student, Tokyo University, Japan
- 2019/9 - 2021/8
Principal Supervisor Zixiang Xian (Completed) , Concordia University
Thesis/Project Title: Generative Models Based on the Bounded Asymmetric Gaussian Distribution
Present Position: Instructor, United International College, Hong Kong, China
- 2019/9 - 2021/12
Principal Supervisor Ravi Teja Vemuri (Completed) , Concordia University
Thesis/Project Title: Fully Bayesian Learning with Markov Chain Monte Carlo Techniques for Asymmetric Generalized Gaussian Mixture and Hidden Markov Models
Present Position: Unknown
- 2019/9 - 2022/6
Principal Supervisor Oumayma Dalhoumi (Completed) , Concordia University
Thesis/Project Title: Non Negative Matrix Factorization
Present Position: Data Scientist, Ericsson
- 2019/9 - 2020/12
Co-Supervisor Behnam Farsi Balouch (Completed) , Concordia University
Thesis/Project Title: On Short-Term Load Forecasting using Machine Learning Techniques
Present Position: CEO, Icanapply Inc.
- 2019/9 - 2021/12
Principal Supervisor Guo Jiaxun (Completed) , Concordia University
Thesis/Project Title: Occupancy Estimation and Activity Recognition in Smart Buildings using Mixture-Based Predictive Distributions
Present Position: PhD student, Concordia University
- 2019/9 - 2021/4
Principal Supervisor Mahsa Amirkhani (Completed) , Concordia University
Thesis/Project Title: Bayesian Learning Frameworks for Multivariate Beta Mixture Models
Present Position: Data scientist, Bell Montreal
- 2019/1 - 2021/12
Principal Supervisor Mark Haddad (Completed) , Concordia university
Thesis/Project Title: An Instance-Based Learning Statistical Framework for One-Shot and Few-Shot Human Action Recognition
Present Position: Quality Control, Pratt & Whitney

- 2019/1 - 2020/12
Principal Supervisor
Mohammad Sadegh Ahmadzadeh (Completed) , Concordia University
Thesis/Project Title: A Study on Entropy-Based Variational Learning for Mixture Models
Present Position: Data scientist, OVE DECORS
- 2019/1 - 2020/12
Principal Supervisor
Yogesh Pawar (Completed) , Concordia University
Thesis/Project Title: Machine learning for intrusion detection
Present Position: Research associate, Université de Montreal
- 2018/9 - 2020/3
Principal Supervisor
Xavier Sumba (Completed) , Concordia University
Thesis/Project Title: Approximate Bayesian Inference for Count Data Modeling
Present Position: Data Scientist, Heyday.ai
- 2018/9 - 2020/8
Principal Supervisor
Ornela Bregu (Completed) , Concordia University
Thesis/Project Title: Mixture-Based Clustering for High-Dimensional Count Data Using Minorization-Maximization Approaches
Present Position: PhD student, Concordia University
- 2018/9 - 2019/10
Principal Supervisor
Ziyang Song (Completed) , Concordia University
Thesis/Project Title: Nonparametric Bayesian Models Based on Asymmetric Gaussian Distributions
Present Position: PhD student, National University of Singapore
- 2018/9 - 2020/3
Principal Supervisor
Md. Hafizur Rahman (Completed) , Concordia University
Thesis/Project Title: Distributional Feature Mapping in Data Classification
Present Position: Data Scientist, Heyday.ai
- 2018/9 - 2020/7
Principal Supervisor
Srikanth Amudala (Completed) , Concordia University
Thesis/Project Title: Variational Techniques for Medical and Image Processing Applications using Generalized Gaussian Distribution
Present Position: Data Scientist, Teck Resources Limited
- 2018/9 - 2020/3
Principal Supervisor
Pantea Koochemseshkian (Completed) , Concordia University
Thesis/Project Title: Distribution-Based Regression for Count and Semi-Bounded Data
Present Position: PhD student, Concordia University
- 2018/9 - 2020/5
Principal Supervisor
Zainab Arjmandi (Completed) , Concordia University
Thesis/Project Title: Variational Learning for Finite Shifted-Scaled Dirichlet Mixture Model and its Applications
Present Position: Software engineer, Technologies Adaptive, Montreal
- 2018/9 - 2019/12
Principal Supervisor
Meeta Kalra (Completed) , Concordia University
Thesis/Project Title: Online variational learning for medical images processing
Present Position: Data Scientist, Data Performers
- 2018/9 - 2020/10
Principal Supervisor
Fahdah Al-alyan (Completed) , Concordia University
Thesis/Project Title: Statistical Approaches for Binary and Categorical Data Modeling
Present Position: Lecturer, Um-Alqura University, Saudi Arabia
- 2018/1 - 2019/8
Principal Supervisor
Masoud Daghyani (Completed) , Concordia University
Thesis/Project Title: Efficient Computation of Log-likelihood Function in Clustering Overdispersed Count Data
Present Position: Data Analyst, Empire CO ltd. Toronto
- 2018/1 - 2020/12
Principal Supervisor
Omar Graja (Completed) , Concordia University
Thesis/Project Title: Spatial and Temporal Predictions for Positive Vectors
Present Position: Data Scientist, Heyday.ai
- 2018/1 - 2019/4
Principal Supervisor
Narges Manouchehri (Completed) , Concordia University
Thesis/Project Title: Finite Bivariate and Multivariate Beta Mixture Models Learning and Applications
Present Position: PhD student, Concordia University

- 2017/9 - 2019/1
Principal Supervisor Jaspreet Singh Kalsi (Completed) , Concordia University
Thesis/Project Title: Color Image Segmentation by Integrating Spatial Information using Semi-Bounded Finite Mixture Models
Present Position: Data scientist, Sofdesk Inc.
- 2017/9 - 2019/2
Principal Supervisor Divya Ankam (Completed) , Concordia University
Thesis/Project Title: Distributions based Regression Techniques for Compositional Data
Present Position: AI/ML Technical solutions Engineer, Google
- 2017/9 - 2019/6
Principal Supervisor Hieu Nguyen (Completed) , Concordia University
Thesis/Project Title: Variational Approaches for Learning Finite Scaled Dirichlet Mixture Models
Present Position: Data Scientist, The International Air Transport Association (IATA)
- 2017/9 - 2019/8
Principal Supervisor Kamal Maanicshah (Completed) , Concordia University
Thesis/Project Title: A Study on Variational Component Splitting Approach for Mixture Models
Present Position: PhD student, Concordia University
- 2017/1 - 2018/8
Principal Supervisor Rua Suroji (Completed) , Concordia University
Thesis/Project Title: Multidimensional Proportional Data Clustering using Shifted-Scaled Dirichlet Model
Present Position: Lecturer, Um-Alqura University, Saudi Arabia
- 2016/5 - 2018/5
Principal Supervisor Shuai Fu (Completed) , Concordia University
Thesis/Project Title: Bayesian Learning of Asymmetric Gaussian-Based Statistical Models Using Markov Chain Monte Carlo Techniques
Present Position: Senior Software Engineer, Shape Security Silicon Valley, USA
- 2016/1 - 2017/12
Principal Supervisor Jaipuneet Singh (Completed) , Concordia University
Thesis/Project Title: Proportional Data Modeling Using Unsupervised Learning and Applications
Present Position: Data scientist, Douglas Mental Health University Institute
- Doctorate [n=22]**
- 2022/1 - 2025/12
Co-Supervisor Siavash Farazmand (In Progress) , Concordia University
Thesis/Project Title: Graph Neural Networks for Transportation
Present Position: PhD student, Concordia University
- 2022/1 - 2025/12
Principal Supervisor Akinlolu Oluwabusayo Ojo (In Progress) , Concordia University
Student Degree Expected Date: 2025/12
Thesis/Project Title: Interactive machine learning
Present Position: PhD student, Concordia University
- 2022/1 - 2025/12
Principal Supervisor Jiaxun Guo (In Progress) , Concordia University
Student Degree Expected Date: 2025/12
Thesis/Project Title: Deep mixture models
Present Position: PhD student, Concordia University
- 2021/9 - 2024/12
Principal Supervisor Ornela Bregu (In Progress) , Concordia University
Thesis/Project Title: Topic Modeling Based on Flexible Distributions
Present Position: PhD student, Concordia University
- 2021/9 - 2024/12
Principal Supervisor Ahmed Zgaren (In Progress) , Concordia University
Thesis/Project Title: Machine Learning for UAV imagery
Present Position: PhD student, Concordia University

2021/9 - 2024/12 Principal Supervisor	Alaa Nfissi (In Progress) , Concordia University Thesis/Project Title: Audio Processing using Explainable Deep Learning Present Position: PhD student, Concordia University
2021/1 - 2024/4 Co-Supervisor	Asiye Baghbani (In Progress) , Concordia University Student Degree Expected Date: 2024/4 Thesis/Project Title: Load forecasting in Micro Transit Demand Management Present Position: PhD student, Concordia University
2020/9 - 2023/12 Principal Supervisor	Viet Tra (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Machine Learning for Energy and Buildings Present Position: PhD student, Concordia University
2020/9 - 2023/8 Principal Supervisor	Ali Algumaei (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Conversational agents using AI Present Position: PhD student, Concordia University
2020/9 - 2024/12 Principal Supervisor	Pantea Koochemseshkian (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Time series analysis Present Position: PhD student, Concordia University
2020/1 - 2023/8 Co-Supervisor	Soroush Samareh Abolhassani (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: AI for Smart Buildings Present Position: PhD student, Concordia University
2019/9 - 2023/3 Principal Supervisor	Kamal Maanicshah (Completed) , Concordia University Thesis/Project Title: Novel Mixture Allocation Models for Topic Learning Present Position: Data Scientist, Buspas Inc.
2019/9 - 2023/8 Principal Supervisor	Hafsa Ennajari (Completed) , Concordia University Thesis/Project Title: Embedded Spherical Probabilistic Modeling for Topic Discovery and Text Representation Learning in Unstructured Text Data Present Position: PhD student, Concordia University
2019/6 - 2022/10 Principal Supervisor	Fatma Najar (Completed) , Concordia University Thesis/Project Title: Smoothed Probabilistic Algorithms for Sparse Data with Application to Emotion Recognition and Sentiment Analysis Present Position: Assistant Professor, City University of New York, USA
2019/5 - 2022/6 Principal Supervisor	Narges Manouchehri (Completed) , Concordia University Thesis/Project Title: Generative Learning Models and Applications in Healthcare Present Position: Postdoc, NSERC Postdoctoral Fellowship, Karolinska institute, Sweden
2019/1 - 2023/5 Principal Supervisor	Hussein Al-Bazzaz (Completed) , Concordia University Thesis/Project Title: Mixture-Based Clustering and Hidden Markov Models for Energy Management and Human Activity Recognition: Novel Approaches and Explainable Applications Present Position: Unknown
2018/9 - 2022/5 Principal Supervisor	Rim Nasfi (Completed) , Concordia University Thesis/Project Title: Modeling Semi-Bounded Support Data using Non-Gaussian Hidden Markov Models with Applications Present Position: Data Scientist, Deloitte

- 2018/5 - 2021/8
Principal Supervisor
Vahid Khorasani Ghassab (Completed) , Concordia University
Thesis/Project Title: Multi-Frame Reconstruction Using Super-Resolution, Inpainting, Segmentation and Codecs
Present Position: Data Scientist, IPTOKI Inc., Montreal
- 2018/1 - 2021/4
Principal Supervisor
Samr Ali (Completed) , Concordia University
Thesis/Project Title: Hidden Markov Models and their Extensions for Proportional Sequential Data
Present Position: Data scientist, Ericsson
- 2016/1 - 2020/1
Principal Supervisor
Nuha Zamzami (Completed) , Concordia University
Thesis/Project Title: High-Dimensional Sparse Count Data Clustering using Finite Mixture Models
Present Position: Assistant Professor, King Abdulaziz University, KSA
- 2015/9 - 2020/12
Principal Supervisor
Koffi Eddy Ihou (Completed) , Concordia University
Thesis/Project Title: Extensions to the Latent Dirichlet Allocation Topic Model using Flexible Priors
Present Position: Data Scientist, Zetane Systems Inc.
- 2012/9 - 2017/8
Principal Supervisor
Muhammad Azam (Completed) , Concordia University
Thesis/Project Title: Bounded Support Finite Mixture Models for Multidimensional Data Modeling and Clustering
Present Position: Research Scientist, Brainbox

Post-doctorate [n=7]

- 2023/1 - 2024/12
Co-Supervisor
Shahin Masoumi (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Deep learning for Energy Applications
Present Position: Post-doctorate, Concordia University
- 2023/1 - 2024/12
Co-Supervisor
Mehdi Meshknai (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Machine learning for Intelligent Transportation
Present Position: Post-doctorate, Concordia University
- 2022/10 - 2023/2
Co-Supervisor
Fereshteh Samadi Mollayousefi (Completed) , Concordia University
Thesis/Project Title: Intelligent transportation
Present Position: Postdoctoral fellow, ETS, Montreal
- 2021/8 - 2022/1
Principal Supervisor
Vahid Khorasani Ghassab (Completed) , Concordia University
Thesis/Project Title: Development of a Solution to Assess the Quality and to Optimize AI-Based Video Codecs
Present Position: Data Scientist, IPTOKI Inc., Montreal
- 2021/1 - 2021/12
Principal Supervisor
Koffi Eddy Ihou (Completed) , Concordia University
Thesis/Project Title: Machine learning for Micro Transit Demand Management
Present Position: Data Scientist, Zetane Systems Inc.
- 2020/7 - 2021/10
Principal Supervisor
Muhammad Azam (Completed) , Concordia University
Thesis/Project Title: Machine learning for Micro Transit Demand Management
Present Position: Principal Data Scientist, Brainbox Inc.
- 2020/1 - 2020/12
Principal Supervisor
Manar Amayri (Completed) , Concordia University
Thesis/Project Title: Machine learning for Smart Buildings
Present Position: Assistant Professor, Grenoble Institute of Technology, France

Editorial Activities

2023/1 - 2024/12	Associate Editor, IEEE Transactions on Neural Networks and Learning Systems, Journal
2022/1 - 2024/12	Associate editor, Engineering Applications of Artificial Intelligence, Journal
2021/1 - 2024/12	Associate editor, Journal of imaging, Journal
2021/1 - 2024/12	Associate editor, Sensors, Journal
2012/9 - 2024/12	Associate editor, Pattern Recognition, Journal
2013/9 - 2018/8	Associate editor, ISRN Signal Processing, Journal
2013/8 - 2018/7	Associate editor, International Journal of Rough Sets and Data Analysis, Journal
2012/12 - 2017/11	Associate editor, Journal of Engineering, Journal
2012/6 - 2017/5	Associate editor, The Scientific World Journal, Journal

Organizational Review Activities

2023/5 - 2023/7	External hiring committee member, Télé-université External member of TELUQ hiring committee
2016/9 - 2022/10	Referee, Natural Sciences and Engineering Research Council of Canada (NSERC) Referee for many research proposals, research chairs, Gerhard Herzberg Canada Gold Medal for Science and Engineering, etc.
2022/6 - 2022/8	Referee for funding proposals, Italian Science Fund Evaluating funding proposals
2022/5 - 2022/6	Referee for promotion, Télé-université Referee to promotion to Full professor
2019/1 - 2021/12	Referee, AI projects, Prompt Quebec Evaluation Committee of AI projects
2021/1 - 2021/3	Referee to promotion, King Abdulaziz University Referee to promotion to associate professor, King Abdullah University of Science and Technology (KAUST)
2019/1 - 2019/6	Referee for funding proposals, UK Engineering and Physical Sciences Research Council Referee for funding proposals for EPSRC.
2019/4 - 2019/5	Referee to promotion, Liverpool John Moores University Referee for promotion to Reader
2018/11 - 2018/12	Referee for promotion, American University, Beirut Referee for promotion to associate professor
2018/10 - 2018/11	Referee for promotion, Asian Institute of Technology Referee for promotion to full professor
2018/6 - 2018/9	Referee for funding proposals, National Science Center, Poland Referee for funding proposals

International Collaboration Activities

2021/1 - 2022/12	Research Collaborator, China Explainable machine learning techniques
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2020/11 - 2022/12 Research Collaborator, France
 Collaboration on using advanced machine learning techniques for smart buildings applications

Committee Memberships

2022/12 Committee Member, Technical program committee, Workshop on AI-Driven Smart Healthcare, with IEEE Global Communications Conference, IEEE

2022/10 Committee Member, Technical program committee, International Conference on Advanced Data Mining and Applications (ADMA), Springer

2022/9 Committee Member, Technical program committee, International Conference on Knowledge Discovery and Information Retrieval (KDIR), IEEE

2022/9 Committee Member, Technical program committee, IEEE International Conference on Artificial Intelligence for Industries (AI4I), IEEE

2022/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE

2022/5 Committee Member, Technical program committee, International Flairs conference, The Florida Artificial Intelligence Research Society

2022/5 Committee Member, Technical program committee, Canadian Conference on Artificial Intelligence, Canadian Artificial Intelligence Association

2021/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE

2021/12 Committee Member, Technical program committee, International Symposium on Visual Computing, IAPR

2021/9 Committee Member, Technical program committee, IEEE International Conference on Artificial Intelligence for Industries, IEEE

2021/7 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association

2021/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE

2021/5 Committee Member, Technical program committee, The International Flairs conference, The Florida Artificial Intelligence Research Society

2021/5 Committee Member, Technical program committee, Canadian Conference on Artificial Intelligence, Canadian Artificial Intelligence Association

2021/2 Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication

2020/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE

2020/12 Committee Member, Technical program committee, International Symposium on Visual Computing, IAPR

2020/12 Committee Member, Technical program committee, Workshop on AI-Driven Smart Healthcare, with IEEE Global Communications Conference, IEEE

- 2020/10 Committee Member, Technical program committee, The 1st International Conference on Cognitive Analytics, Granular Computing, and Three-Way Decisions, Belief Functions and Applications Society
- 2020/9 Committee Member, Technical program committee, IEEE International Conference on Artificial Intelligence for Industries, IEEE
- 2020/9 Committee Member, Technical program committee, International Conference on Web Services, The Services Society (S2)
- 2020/8 Committee Member, Technical program committee, The second International Conference on Deep Learning, Big Data and Blockchain, IEEE
- 2020/8 Committee Member, Technical program committee, The International Conference on Deep Learning and Machine Learning in Emerging Applications, IEEE
- 2020/8 Committee Member, Technical program committee, International Conference on Web Services, The Services Society (S2)
- 2020/6 Committee Member, Technical program committee, 23rd International Conference on Business Information Systems, BIS
- 2020/6 Committee Member, Technical program committee, International Conference on Control, Decision and Information Technologies, IEEE
- 2020/6 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
- 2020/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
- 2020/5 Committee Member, Technical program committee, Canadian Conference on Artificial Intelligence, Canadian Artificial Intelligence Association
- 2020/5 Committee Member, Technical program committee, The International Flairs conference, The Florida Artificial Intelligence Research Society
- 2020/2 Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication
- 2019/12 Committee Member, Technical program committee, International Conference on Brain Informatics, CAAI Technical Committee on Brain Science and Artificial Intelligence
- 2019/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE
- 2019/9 Committee Member, Technical program committee, IEEE International Conference on Artificial Intelligence for Industries, IEEE
- 2019/7 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
- 2019/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
- 2019/5 Committee Member, Technical program committee, Canadian Conference on Artificial Intelligence, Canadian Artificial Intelligence Association
- 2019/4 Committee Member, Technical program committee, International Conference on Control, Decision and Information Technologies, IEEE

- 2019/2 Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication
- 2018/12 Committee Member, Technical program committee, International Conference on Brain Informatics, CAAI Technical Committee on Brain Science and Artificial Intelligence
- 2018/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE
- 2018/9 Committee Member, Technical program committee, IEEE International Conference on Artificial Intelligence for Industries, IEEE
- 2018/7 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
- 2018/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
- 2018/5 Committee Member, Technical program committee, Canadian Conference on Artificial Intelligence, Canadian Artificial Intelligence Association
- 2018/4 Committee Member, Technical program committee, International Conference on Control, Decision and Information Technologies, IEEE
- 2018/2 Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication
- 2017/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE
- 2017/7 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
- 2017/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
- 2017/3 Committee Member, Technical program committee, International Conference on Control, Decision and Information Technologies, IEEE
- 2017/2 Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication
- 2016/12 Chair, 9th International Conference Developments in eSystems Engineering (DeSE 2016), IEEE
- 2016/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE
- 2016/7 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
- 2016/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
- 2016/3 Committee Member, Technical program committee, International Conference on Control, Decision and Information Technologies, IEEE

2016/3	Chair, The International Conference on Control, Decision and Information Technologies (CoDIT'2016), IEEE
2016/2	Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication
2015/12	Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE
2015/10	Committee Member, Technical program committee, IEEE International Conference on Tools with Artificial Intelligence (ICTAI), IEEE
2015/7	Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
2015/6	Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
2015/2	Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication

Other Memberships

2008/6	Member, Professional Engineers ontario
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Broadcast Interviews

2010/07/20 - 2010/07/20	Computer Vision Research, RCI // POMME ET MANDARINE, Radio Canada International (RCI)
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Text Interviews

2021/03/05	Laying the foundation for building a sustainable and resilient city, The Globe and Mail
2020/02/10	Machine learning for smart buildings, leDevoir

Publications

Journal Articles

1. R. Gonsalves, Z. Montajabi*, S. Mahtur and N. Bouguila. (2023). Machine Learning Applied to Media Libraries for Insights, Serach, and Segmentation. SMPTE Motion Imaging Journal. 132(33): 27-38.
Published
Refereed?: Yes
2. A. Zgaren*, W. Bouachir, and N. Bouguila. (2023). Automatic Counting of Planting Microsites via Local Visual Detection and Global Counting Estimation. IEEE Transactions on Emerging Topics in Computational Intelligence.
In Press
Refereed?: Yes

3. S. Rahmani, A. Baghbani*, N. Bouguila and Z. Patterson. (2023). Graph Neural Networks for Intelligent Transportation Systems. IEEE Transactions on Intelligent Transportation Systems. 24(8): 8846-8885.
Published
Refereed?: Yes, Open Access?: Yes
4. J. Guo*, M. Amayri, W. Fan, and N. Bouguila. (2023). Liouville-Based Predictive Models for Occupancy Estimation using Small Training Data. IEEE Internet of Things Journal.
In Press
Refereed?: Yes
5. M. Osadebey*, M. Pedersen, M. Kalra*, D. Waaler and N. Bouguila. (2023). Enhancement of Clustering Techniques by Coupling Clustering Tree and Neural Network: Application to Brain Tumor Segmentation. Expert Systems – The Journal of Knowledge Engineering. 40(30): Article e13176.
Published
Refereed?: Yes
6. O. Dalhoumi*, N. Bouguila, M. Amayri and W. Fan. (2023). Bayesian Matrix Factorization for Semi-Bounded Data. IEEE Transactions on Neural Networks and Learning Systems. 34(6): 3111-3123.
Published
Refereed?: Yes
7. A. Al-gumaei*, M. Azam*, M. Amayri and N. Bouguila. (2023). ICA and IVA Bounded Multivariate Generalized Gaussian Mixture Based Hidden Markov Models. Engineering Applications of Artificial intelligence. 123(Part B): Article 106345.
Published
Refereed?: Yes
8. Z. Luo*, M. Amayri, W. Fan and N. Bouguila. (2023). Cross-Collection Latent Beta-Liouville Allocation Model Training with Privacy Protection and Applications. Applied Intelligence. 53(14): 17824-17848.
Published
Refereed?: Yes
9. H. Ennajari*, N. Bouguila and J. Bentahar. (2023). Combining Knowledge Graph and Word Embeddings for Spherical Topic Modeling. IEEE Transactions on Neural Networks and Learning Systems. 34(7): 3609-3623.
Published
Refereed?: Yes
10. A. Al-gumaei*, M. Azam*, F. Najar* and N. Bouguila. (2023). Bounded Multivariate Generalized Gaussian Mixture Model using ICA and IVA. Patten Analysis and Applications. 26(3): 1223-1252.
Published
Refereed?: Yes
11. V. Khorasani*, R. Gonsalves, S. Mahtur and N. Bouguila. (2023). Optimizing Video Compression with CNN-Based Autoencoders with Chroma Subsampling. SMPTE Motion Imaging Journal. 132(33): 18-26.
Published
Refereed?: Yes
12. A. Rebei*, M. Amayri, and N. Bouguila. (2023). FSNet: A Hybrid Model for Seasonal Forecasting. IEEE Transactions on Emerging Topics in Computational Intelligence.
In Press
Refereed?: Yes
13. W. Fan, W. Shangguan and N. Bouguila. (2023). Continous Image Anomaly Detection Based on Contrastive Lifelong Learning. Applied Intelligence. 53(14): 17693-17707.
Published
Refereed?: Yes

14. N. Zamzami* and N. Bouguila. (2023). A Novel Minorization-Maximization Framework for Simultaneous Feature Selection and Clustering of High-Dimensional Count Data. *Pattern Analysis and Applications*. 26(1): 91-106.
Published
Refereed?: Yes, Open Access?: No
15. F. Najar* and N. Bouguila. (2023). On Smoothing and Scaling Language Model for Sentiment Based Information Retrieval. *Advances in Data Analysis and Classification*. 17(3): 725-744.
Published
Refereed?: Yes
16. A. Baghbani*, Z. Patterson and N. Bouguila. (2023). Short-Term Passenger Flow Prediction Using a Bus Network Graph Convolutional LSTM Neural Network Model. *Transportation Research Record*. 2677(2): 1331-1340.
Published
Refereed?: Yes, Open Access?: Yes
17. H. Jemaa*, W. Bouachir, B. Leblon, A. LaRocque, A. Haddadi, and N. Bouguila. (2023). UAV-Based Computer Vision System for Orchard Tree Detection and Health Assessment. *Remote Sensing*. 15(14): Article 3558.
Published
Refereed?: Yes, Open Access?: Yes
18. J. Guo*, M. Amayri, F. Najar*, W. Fan and N. Bouguila. (2023). Occupancy Estimation in Smart Buildings using Predictive Modeling in Imbalanced Domains. *Journal of Ambient Intelligence and Humanized Computing*. 14(8): 10917-10929.
Published
Refereed?: Yes, Open Access?: No
19. F. Alkhawaja* and N. Bouguila. (2023). Unsupervised Nested Dirichlet Finite Mixture Model for Clustering. *Applied Intelligence*.
In Press
Refereed?: Yes
20. S. Bourouis and N. Bouguila. (2023). Unsupervised Learning using Expectation Propagation Inference of Inverted Beta-Liouville Mixture Models for Pattern Recognition Applications. *Cybernetics and Systems*. 54(4): 474-498.
Published
Refereed?: Yes
21. N. Manouchehri* and N. Bouguila. (2023). Human Activity Recognition with an HMM-Based Generative Model. *Sensors*. 23(3): Article 1390.
Published
Refereed?: Yes, Open Access?: Yes
22. S. Bourouis and N. Bouguila. (2023). Expectation Propagation Learning of Finite and Infinite Gamma Mixture Models and its Applications. *Multimedia Tools and Applications*. 82(21): 33267-33284.
Published
Refereed?: Yes
23. Z. Montajabi*, R. Gonsalves, S. Mahtur and N. Bouguila. (2023). Semantic Regions of Interest Applied to Adaptive Image Compression, Color Enhancement, and Automated Pan-and-Scan. *SMPTE Motion Imaging Journal*. 132(33): 39-47.
Published
Refereed?: Yes

24. S. Hannachi*, F. Najar*, H. Ennajari*, and N. Bouguila. (2023). Online Short Text clustering using Infinite Extensions of Discrete Mixture Models. Computational intelligence. In Press
Refereed?: Yes
25. L. Yang, W. Fan, and N. Bouguila. (2023). Deep Clustering Analysis via Dual Variational Autoencoder with Spherical Latent Embeddings. IEEE Transactions on Neural Networks and Learning Systems. 34(9): 6303-6312.
Published
Refereed?: Yes
26. W. Fan, L. Yang and N. Bouguila. (2023). Grouped Spherical Data Modeling Through Hierarchical Nonparametric Bayesian Models and Its Application to fMRI Data Analysis. IEEE Transactions on Neural Networks and Learning Systems.
In Press
Refereed?: Yes
27. J. Dridi*, M. Amayri and N. Bouguila. (2023). Unsupervised Domain Adaptation With and Without Access to Source Data for Estimating Occupancy and Recognizing Activities in Smart Buildings. Building and Environment. 243: Article 110651.
Published
Refereed?: Yes
28. S. Ali* and N. Bouguila. (2022). Towards Scalable Deployment of Hidden Markov Models in Occupancy Estimation: A Novel Methodology Applied to the Study Case of Occupancy Detection. Energy and Buildings. 254: Article 111594.
Published
Refereed?: Yes
29. N. S. Alghamdi, S. Bourouis and N. Bouguila. (2022). Effective Frameworks Based on Infinite mixture Model for Real-World Applications. CMC-Computers, Materials & Continua. 72(1): 1139-1156.
Published
Refereed?: Yes
30. M. Azam* and N. Bouguila. (2022). Multivariate Bounded Support Asymmetric Generalized Gaussian Mixture Model with Model Selection using Minimum Message Length. Expert Systems With Applications. 204: 117516.
Published
Refereed?: Yes
31. Y. Ling, W. Fan and N. Bouguila. (2022). Clustering Analysis via Deep Generative Models with Mixture Models. IEEE Transactions on Neural Networks and Learning Systems. 33(1): 340-350.
Published
Refereed?: Yes
32. N. Manouchehri* and N. Bouguila. (2022). A Nonparametric Bayesian Learning Model using Accelerated Variational Inference on Multivariate Beta Mixture Models for Medical Applications. International Journal of Semantic Computing. 16(3): 449-469.
Published
Refereed?: Yes
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Published, Elsevier
Refereed?: Yes
14. M. Kalra* and N. Bouguila. (2021). Online Variational Learning using Finite Generalized Inverted Dirichlet Mixture Model with Feature Selection on Medical Data Sets. M. Masmoudi, B. Jarboui and P. Siarry. *Artificial Intelligence and Data Mining in Healthcare*. : 143-177.
Published, Springer
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15. B. Alghabashi*, M. Almashrgy*, M. Azam* and N. Bouguila. (2021). Finite Multi-Dimensional Generalized Gamma Mixture Model Learning for Feature Selection. D. Zhang and B. Wei. *Learning Control: Applications in Robotics and Complex Dynamical Systems*. : 147-173.
Published, Elsevier
Refereed?: Yes
16. M. Azam*, B. Alghabashi* and N. Bouguila. (2020). Multivariate Bounded Asymmetric Gaussian Mixture Model. *Mixture Models and Applications*. : 61-80.
Published, Springer
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17. M. Daghyani*, N. Zamzami* and N. Bouguila. (2020). Toward an Efficient Computation of Log-Likelihood Functions in Statistical Inference: Overdispersed Count Data Clustering. *Mixture Models and Applications*. : 155-176.
Published, Springer
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Published, Springer
Refereed?: Yes
19. K. Maanicshah*, M. Azam*, H. Nguyen*, N. Bouguila and W. Fan. (2020). Finite Inverted Beta-Liouville Mixture Models with Variational Component Splitting. *Mixture Models and Applications*. : 209-233.
Published, Springer
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20. W. Chen, W. Fan, N. Bouguila and B. Zhong. (2020). Medical Image Segmentation Based on Spatially Constrained Inverted Beta-Liouville Mixture Models. *Mixture Models and Applications*. : 307-324.
Published, Springer
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21. N. Zamzami* and N. Bouguila. (2020). Deriving Probabilistic SVM Kernels From Exponential Family Approximation to Multivariate Distributions for Count Data. *Mixture Models and Applications*. : 125-153.
Published, Springer
Refereed?: Yes
22. W. Fan, N. Bouguila, Y. Chen and Z. Chen. (2020). L2 Normalized Data Clustering Through the Dirichlet Process Mixture Model of Von Mises Distributions with Localized Feature Selection. *Mixture Models and Applications*. : 109-123.
Published, Springer
Refereed?: Yes
23. N. Manouchehri* and N. Bouguila. (2020). A Frequentist Inference Method Based on Finite Bivariate and Multivariate Beta Mixture Models. *Mixture Models and Applications*. : 179-208.
Published, Springer
Refereed?: Yes
24. J. S. Kalsi*, M. Azam* and N. Bouguila. (2020). Color Image Segmentation using Semi-Bounded Finite Mixture Models by Incorporating Mean Templates. *Mixture Models and Applications*. : 273-305.
Published, Springer
Refereed?: Yes

Conference Publications

1. K. Maanicshah*, N. Manouchehri*, M. Amayri and N. Bouguila. (2023). Novel Topic Models for Parallel Extraction from Multilingual Text. *Lecture Notes in Computer Sciences 13996. 15th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2023)*, (297-309)
Paper
Published
Refereed?: Yes, Invited?: No
2. A. Y. Eita, H. Ennajari*, and N. Bouguila. (2023). 3D Multi-Views Object Classification Based on a Fully Generalized Dirichlet Allocation Model. *24th IEEE International Conference on Industrial Technology (IEEE ICIT 2023)*,
Paper
Published
Refereed?: Yes, Invited?: No
3. H. Al-Bazzaz*, M. Azam, M. Amayri and N. Bouguila. (2023). Enhancing Human Action Recognition with Asymmetric Generalized Gaussian Mixture Mixture-based Hidden Markov Models and Bounded Support. *IEEE Conference on Systems, Man, and Cybernetics (SMC 2023)*,
Paper
Accepted
Refereed?: Yes, Invited?: No
4. D. Forouzanfar*, N. Manouchehri*, and N. Bouguila. (2023). Bayesian Inference in Infinite Multivariate McDonald's Beta Mixture Model. *22nd International Conference on Artificial Intelligence and Soft Computing (ICAISC 2023)*,
Paper
In Press
Refereed?: Yes, Invited?: No

5. O. Bregu*, N. Zamzami*, and N. Bouguila. (2023). Human Age Prediction Based on Brain MRI Using Density-Based Regression. 24th IEEE International Conference on Industrial Technology (IEEE ICIT 2023), Paper
Published
Refereed?: Yes, Invited?: No
6. A. Baghbani*, S. Rahmani, N. Bouguila, and Z. Patterson. (2023). Predicting Passenger Flow using Graph Neural Networks with Scheduled Sampling on Bus Networks. IEEE 26th International Conference on Intelligent Transportation Systems (ITSC 2023), Paper
Accepted
Refereed?: Yes, Invited?: No
7. D. Forouzanfar*, N. Manouchehri*, and N. Bouguila. (2023). Finite Multivariate McDonald's Beta Mixture Model Learning Approach in Medical Applications. 38th ACM/SIGAPP Symposium on Applied Computing (SAC2023), (1143-1150)
Paper
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Refereed?: Yes, Invited?: No
8. D. Forouzanfar*, N. Manouchehri*, and N. Bouguila. (2023). A Fully Bayesian Inference Approach for Multivariate McDonald's Beta Mixture Model with Feature Selection. 9th International Conference on Control, Decision and Information Technologies (CODIT 2023), Paper
In Press
Refereed?: Yes, Invited?: No
9. N. Samiee*, N. Manouchehri*, and N. Bouguila. (2023). Finite Libby-Novick Beta Mixture Model: An MML-Based Approach. Lecture Notes in Computer Sciences 13995. 15th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2023), (371-383)
Paper
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Refereed?: Yes, Invited?: No
10. Z. Golpayegani*, P. St-Amant and N. Bouguila. (2023). Clarifying Myths About the Relationship Between Shape Bias, Accuracy, and Robustness. 20th Conference on Robots and Vision (CRV 2023), (281-287)
Paper
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Refereed?: Yes, Invited?: No
11. H. Jemaa*, W. Bouachir, B. Leblon, A. LaRocque, A. Haddadi and N. Bouguila. (2023). Tree Health Assessment from UAV Images using Hard Negative Mining and Semi-Supervised Autoencoder. 20th Conference on Robots and Vision (CRV 2023), (312-319)
Paper
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Refereed?: Yes, Invited?: No
12. Z. Montajabi*, V. K. Ghassab*, and N. Bouguila. (2023). Invertible Neural Network-Based Video Compression. 12th International Conference on Pattern Recognition Applications and Methods (ICPRAM 2023), (558-564)
Paper
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Refereed?: Yes, Invited?: No

13. H. Al-Bazzaz*, M. Azam, M. Amayri and N. Bouguila. (2023). Enhanced Energy Characterization and Feature Selection using Explainable Nonparametric AGGMM. 15th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2023),
Paper
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Refereed?: Yes, Invited?: No
14. Z. Luo*, M. Amayri, W. Fan and N. Bouguila. (2023). A Selective Supervised Latent Beta-Liouville Allocation for Document Classification. Lecture Notes in Computer Science 13925. 36th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2023), (37-48)
Paper
Published
Refereed?: Yes, Invited?: No
15. M. Chaaben*, A. Baghbani*, N. Bouguila, and Z. Patterson. (2023). Multi-STGAC: A Graph Attention Based Model for Short-term Bus Passenger Flow Forecasting. IEEE 26th International Conference on Intelligent Transportation Systems (ITSC 2023),
Paper
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16. S. Farazmand*, Raghav Narula, Z. Patterson and N. Bouguila. (2023). A Variational Graph Convolution Network with Normalizing Flows for Passenger Flow Prediction. IEEE International Conference on Artificial Intelligence for Industries (AI4I),
Paper
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17. O. Sghaier*, M. Amayri, and N. Bouguila. (2023). Multivariate Beta Normality Scores Approach for Deep Anomaly Detection in Images Using Transformation. IEEE Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
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Refereed?: Yes, Invited?: No
18. F. Rezapoor Nikroo*, M. Amayri and N. Bouguila. (2023). HMMs Recursive Parameter Estimation for Semi-Bounded Data Modeling: Application to Occupancy Estimation in Smart Buildings. 12th International Conference on Smart Cities and Green ICT Systems (SMARTGREENS 2023), (81-88)
Paper
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Refereed?: Yes, Invited?: No
19. K. Maanicshah*, M. Amayri and N. Bouguila. (2023). Novel Topic Models for Content Based Recommender Systems. 25th International Conference on Enterprise Information Systems (ICEIS 2023), (138-145)
Paper
Published
Refereed?: Yes, Invited?: No
20. A. Zgaren*, W. Bouachir, N. Bouguila and R. Hammoud. (2023). MoundCount: A Visual Detection-Based Approach for Automatic Counting of Planting Microsites on UAV Images. 19th IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS 2023), in conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2023), (497-506)
Paper
Published
Refereed?: Yes, Invited?: No

21. S. Paul*, Z. Patterson and N. Bouguila. (2023). CrossMoCo: Multi-Modal Momentum Contrastive Learning for Point Cloud. 20th Conference on Robots and Vision (CRV 2023), (273-280)
Paper
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Refereed?: Yes, Invited?: No
22. H. Al-Bazzaz*, M. Azam, M. Amayri and N. Bouguila. (2023). Explainable Robust Smart Meter Data Clustering for Improved Energy Management. IEEE Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
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Refereed?: Yes, Invited?: No
23. M. K. Akbar*, M. Amayri and N. Bouguila. (2023). Deep Learning Based Solution for Appliance Operational State Detection and Power Estimation in Non-Intrusive Load Monitoring. Lecture Notes in Computer Science 13926. 36th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2023), (59-65)
Paper
Published
Refereed?: Yes, Invited?: No
24. N. Samiee, N. Manouchehri*, and N. Bouguila. (2023). Maximum Likelihood-Based Estimation of Finite Multivariate Libby-Novick Beta Mixture Models in Medical Applications. 24th IEEE International Conference on Industrial Technology (IEEE ICIT 2023),
Paper
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25. F. Najar* and N. Bouguila. (2023). Sentiment Analysis using Smoothed Probabilistic-Based Models. 9th International Conference on Control, Decision and Information Technologies (CODIT 2023),
Paper
In Press
Refereed?: Yes, Invited?: No
26. H. Al-Bazzaz*, K. Prabhakaran*, M. Azam, M. Amayri and N. Bouguila. (2023). Refining Nonparametric Mixture Models with Explainability for Smart Building Applications. IEEE Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
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Refereed?: Yes, Invited?: No
27. V. K. Ghassab*, R. Gonsalves, S. Mathur, and N. Bouguila. (2022). Video Compression Using Convolutional Neural Networks of Video with Chroma Subsampling. SMPTE 2022 Media and Technology Summit,
Paper
Published
Refereed?: Yes, Invited?: No
28. M. Dib, S. Torabi, E. Bou-Harb, N. Bouguila and C. Assi. (2022). EVOLIoT: A Self-Supervised Contrastive Learning Framework for Detecting and Characterizing Evolving IoT Malware Variants. 17th ACM ASIA Conference on Computer and Communications Security (ACM ASIACCS 2022), (452-466)
Paper
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Refereed?: Yes, Invited?: No

29. F. Rezapoor Nikroo*, M. Amayri and N. Bouguila. (2022). Recursive Parameter Estimation on Beta-Liouville Hidden Markov Models. International Conference on Electrical, Computer and Energy Technologies (ICECET 2022),
Paper
Published
Refereed?: Yes, Invited?: No
30. S. Salmanzade*, F. Najar* and N. Bouguila. (2022). Bayesian Folding-In Using Generalized Dirichlet and Beta-Liouville Kernels for Information Retrieval. IEEE Symposium Series on Computational Intelligence (SSCI 2022), (1430-1435)
Paper
Published
Refereed?: Yes, Invited?: No
31. M. N. Nategh*, A. Zgaren*, W. Bouachir, and N. Bouguila. (2022). Automatic Counting of Mounds on UAV Images: Combing Instance Segmentation and Patch-Level Correction. 21th IEEE International Conference on Machine Learning and Applications (ICMLA 2022), (375-381)
Paper
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Refereed?: Yes, Invited?: No
32. R. Nasfi* and N. Bouguila. (2022). Sentiment Analysis from User Reviews Using a Hybrid Generative-Discriminative HMM-SVM Approach. IAPR Joint International Workshop on Statistical Techniques in Pattern recognition (SPR 2022) and Structural and Syntactic Pattern Recognition (SSPR 2022),
Paper
In Press
Refereed?: Yes, Invited?: No
33. N. Manouchehri*, A. Baghdadi* and N. Bouguila. (2022). A Hierarchical Pitman-Yor Mixture of Scaled Dirichlet Distributions. 31st IEEE International Symposium on Industrial Electronics (ISIE 2022, (168-173)
Paper
Published
Refereed?: Yes, Invited?: No
34. Y. Pawar*, M. Amayri and N. Bouguila. (2022). An Accelerated Nonparametric Bayesian Approach for Anomaly Detection with Feature Selection. International Electrical Engineering Congress (IEECON2022),
Paper
Published
Refereed?: Yes, Invited?: No
35. J. Guo*, M. Amayri, W. Fan and N. Bouguila. (2022). Beta-Liouville and Inverted Beta-Liouville Based Predictive Models for Occupancy Detection using Small Training Data. IEEE Symposium Series on Computational Intelligence (SSCI 2022), (223-230)
Paper
Published
Refereed?: Yes, Invited?: No
36. F. Rezapoor Nikroo*, M. Amayri and N. Bouguila. (2022). Recursive Parameter Estimation of Generalized Dirichlet Hidden Markov Models: Application to Occupancy Estimation in Smart Buildings. IEEE International Conference on Industry 4.0, Artificial Intelligence, and Communication Technology (IAICT 2022), (90-96)
Paper
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Refereed?: Yes, Invited?: No

37. F. Najar* and N. Bouguila. (2022). Sparse Generalized Dirichlet Prior Based Bayesian Multinomial Estimation. Lecture Notes in Computer Science 13088, Springer. 17th International Conference on Advanced Data Mining and Applications (ADMA), (177-191)
Paper
Published
Refereed?: Yes, Invited?: No
38. H. Ennajari*, N. Bouguila and J. Bentahar. (2022). Knowledge-Enhanced Spherical Representation Learning for Text Classification. SIAM International Conference on Data Mining (SDM22), (639-647)
Paper
Published
Refereed?: Yes, Invited?: No
39. K. Maanicshah*, M. Amayri and N. Bouguila. (2022). Improving Topic Quality with Interactive Beta-Liouville Mixture Allocation Model. IEEE Symposium Series on Computational Intelligence (SSCI 2022), (1143-1148)
Paper
Published
Refereed?: Yes, Invited?: No
40. H. Ennajari*, N. Bouguila and J. Bentahar. (2022). Embedded Spherical Topic Models for Supervised Learning. 26th International Conference on Pattern Recognition (ICPR), (1650-1656)
Paper
Published
Refereed?: Yes, Invited?: No
41. R. Gonsalves, Z. Montajabi*, S. Mathur, and N. Bouguila. (2022). ML-Based Indexing of Media Libraries for Insights and Serach. SMPTE 2022 Media and Technology Summit,
Paper
Published
Refereed?: Yes, Invited?: No
42. N. Manouchehri* and N. Bouguila. (2022). Integration of Multivariate Beta-Based Hidden Markov Models and Support Vector Machines with Medical Applications. 35th International FLAIRS Conference,
Paper
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43. S. Paul*, Z. Patterson and N. Bouguila. (2022). Improved Training for 3D Point Cloud Classification. IAPR Joint International Workshop on Statistical Techniques in Pattern recognition (SPR 2022) and Structural and Syntactic Pattern Recognition (SSPR 2022),
Paper
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44. N. Manouchehri* and N. Bouguila. (2022). A Flexible and Hybrid Feature Mapping Techniques Based on Multivariate Beta Distribution Kernel Applied to Medical Applications. 23rd IEEE International Conference on Industrial Technology (IEEE ICIT 2022),
Paper
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45. K. Prabhakaran*, J. Dridi*, M. Amayri and N. Bouguila. (2022). Explainable K-Means Clustering for Occupancy Estimation. 12th International Conference on Sustainable Energy Information Technology (SEIT), (326-333)
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Refereed?: Yes, Invited?: No

46. K. Maanicshah*, M. Amayri and N. Bouguila. (2022). Interactive Generalized Dirichlet Mixture Allocation Model. IAPR Joint International Workshop on Statistical Techniques in Pattern recognition (SPR 2022) and Structural and Syntactic Pattern Recognition (SSPR 2022),,
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Refereed?: Yes, Invited?: No
47. O. Dalhoumi*, M. Amayri and N. Bouguila. (2022). A Review of Neural Networks for Buildings Occupancy Measurement. IEEE International Conference on Industry 4.0, Artificial Intelligence, and Communication Technology (IAICT 2022), (29-35)
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48. W. Fan, M. Amayri and N. Bouguila. (2022). Stochastic Expectation Propagation Learning for Unsupervised Feature Selection. 14th International Conference on Computational Collective Intelligence (ICCCI 2022), (674-686)
Paper
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Refereed?: Yes, Invited?: No
49. R. T. Vemuri*, M. Azam*, N. Bouguila and Z. Patterson. (2022). Bayesian Model and Feature Selection in Asymmetric Generalized Gaussian Mixtures. 23rd IEEE International Conference on Industrial Technology (IEEE ICIT 2022),
Paper
In Press
Refereed?: Yes, Invited?: No
50. Z. Montajabi*, R. Gonsalves, and N. Bouguila. (2022). Using ML to Find the Semantic Region of Interest. SMPTE 2022 Media and Technology,
Paper
Published
Refereed?: Yes, Invited?: No
51. N. Manouchehri* and N. Bouguila. (2022). Multivariate Beta Dirichlet Process-Based Hidden Markov Models Applied to Medical Applications. 23rd IEEE International Conference on Industrial Technology (IEEE ICIT 2022),
Paper
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Refereed?: Yes, Invited?: No
52. J. Guo*, M. Amayri, W. Fan and N. Bouguila. (2022). A Generalized Inverted Dirichlet Predictive Model for Activity Recognition using Small Data. Lecture Notes in Computer Science 13343. Proc. of the 35th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/ AIE 2022), (431-442)
Paper
Published
Refereed?: Yes, Invited?: No
53. A. Nfissi*, W. Bouachir, N. Bouguila, and B. L. Mishara. (2022). CNN-n-GRU: End-to-End Speech Emotion Recognition from Raw Waveform Signal using CNNs and Gated Recurrent Unit Networks. IEEE International Conference on Machine Learning and Applications (ICMLA 2022), (699-702)
Paper
Published
Refereed?: Yes, Invited?: No

54. R. Nasfi* and N. Bouguila. (2022). Indoor Activity Recognition Using a Hybrid Generative-Discriminative Approach with Hidden Markov Models and Support Vector Machines. 23rd IEEE International Conference on Industrial Technology (IEEE ICIT 2022),
Paper
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55. K. Ketabchi*, N. Manouchehri* and N. Bouguila. (2022). Fully Bayesian Libby-Novick Beta Mixture Model with Feature Selection. 23rd IEEE International Conference on Industrial Technology (IEEE ICIT 2022),
Paper
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Refereed?: Yes, Invited?: No
56. O. Bouhamed*, M. Amayri and N. Bouguila. (2022). DPnet: transformer-Based Deep Probabilistic Network for Load Forecasting. 8th International Conference on Time Series and Forecasting (ITISE 2022),
Abstract
Published
Refereed?: Yes, Invited?: No
57. Z. Montajabi*, V. K. Ghassab*, and N. Bouguila. (2022). Recurrent Neural Network-Based Video Compression. IEEE International Conference on Machine Learning and Applications (ICMLA 2022), (925-930)
Paper
Published
Refereed?: Yes, Invited?: No
58. H. Jemaa*, W. Bouachir, B. Leblon and N. Bouguila. (2022). Computer Vision System for Detecting Orchards Trees from UAV Image. XXIVth International Society for Photogrammetry and Remote Sensing (ISPRS) Congres, (661-668)
Paper
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Refereed?: Yes, Invited?: No
59. N. Manouchehri*, N. Bouguila, and W. Fan. (2021). Batch and Online Variational learning of Hierarchical Pitman-Yor Mixtures of Multivariate Beta Distributions. IEEE. 20th IEEE International Conference on Machine Learning and Applications (ICMLA 2021), (298-303)
Conference Date: 2021/12
Paper
Published
Refereed?: Yes, Invited?: No
60. A. Rebei*, O. Dalhoumi*, N. Manouchehri*, A. Baghdadi*, M. Amayri and N. Bouguila. (2021). Variational Learning of the Mixture of Shifted-Scaled Dirichlet Distributions via Entropy Splitting. IEEE. International Symposium on Networks, Computers and Communications (ISNCC), (1-6)
Conference Date: 2021/10
Paper
Published
Refereed?: Yes, Invited?: No
61. N. Manouchehri* and N. Bouguila. (2021). Stochastic Expectation Propagation Learning of Infinite Multivariate Beta Mixture Models for Human Tissue Analysis. IEEE. 47th Annual Conference of the IEEE Industrial Electronics Society (IECON 2021), (1-6)
Conference Date: 2021/10
Paper
Published
Refereed?: Yes, Invited?: No

62. V. K. Ghassab* and N. Bouguila. (2021). Hyperspectral Video Super-Resolution using Beta Process and Bayesian Dictionary Learning. Lecture Notes in Computer Science, Vol. 13018, Springer. 16th International Symposium on Visual Computing (ISVC 2021), (251-262)
Conference Date: 2021/10
Paper
Published
Refereed?: Yes, Invited?: No
63. F. Najar* and N. Bouguila. (2021). Sparse Document Analysis using Beta-Liouville Naïve Bayes with Vocabulary Knowledge. Lecture Notes in Computer Science 12822, Springer. 16th International Conference on Document Analysis and recognition (ICDAR 2021), (351-363)
Conference Date: 2021/9
Paper
Published
Refereed?: Yes, Invited?: No
64. Z. Xian*, M. Azam* and N. Bouguila. (2021). Statistical Modeling using Bounded Asymmetric Gaussian Mixtures: Application to Human Action and Gender Recognition. IEEE. 22nd IEEE International Conference on Information Reuse and Integration for Data Science (IRI 2021), (41-48)
Conference Date: 2021/8
Paper
Published
Refereed?: Yes, Invited?: No
65. Z. Xian*, M. Azam*, M. Amayri* and N. Bouguila. (2021). Model Selection Criterion for Multivariate Bounded Asymmetric Gaussian Mixture Model. IEEE. 29th European Conference on Signal Processing (EUSIPCO2021), (1436-1440)
Conference Date: 2021/8
Paper
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Refereed?: Yes, Invited?: No
66. N. Maouchehri*, A. Baghdadi* and N. Bouguila. (2021). A Hierarchical Nonparametric Bayesian Model Based on Scaled Dirichlet Distribution. IEEE. 22nd IEEE International Conference on Information Reuse and Integration for Data Science (IRI 2021), (61-68)
Conference Date: 2021/8
Paper
Published
Refereed?: Yes, Invited?: No
67. F. Najar* and N. Bouguila. (2021). Jointly Smoothing Word Embedding and Text Representation. IEEE. 22nd IEEE International Conference on Information Reuse and Integration for Data Science (IRI 2021), (282-289)
Conference Date: 2021/8
Paper
Published
Refereed?: Yes, Invited?: No
68. M. Amirkhani*, N. Maouchehri* and N. Bouguila. (2021). A Nonparametric Bayesian Framework for Multivariate Beta Mixture Models. IEEE. 22nd IEEE International Conference on Information Reuse and Integration for Data Science (IRI 2021), (83-90)
Conference Date: 2021/8
Paper
Published
Refereed?: Yes, Invited?: No

69. M. H. Rahman*, S. Ali* and N. Bouguila. (2021). Efficient Parameter Based Online object Tracking. IEEE. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2021), (1-8)
Conference Date: 2021/7
Paper
Published
Refereed?: Yes, Invited?: No
70. S. Hannachi*, F. Najar*. K. Ihou*, and N. Bouguila. (2021). Collapsed Gibbs Sampling of Beta-Liouville Multinomial for Short Text Clustering. Lecture Notes in Computer Science 12798, Springer. 34th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2021), (564-571)
Conference Date: 2021/7
Paper
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Refereed?: Yes, Invited?: No
71. W. Fan, Z. Guo, N. Bouguila, and W. Hou. (2021). Clustering-Based Online News Topic Detection and Tracking Through Hierarchical Bayesian Nonparametric Models. ACM. 44th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2021), (2126-2130)
Conference Date: 2021/7
Paper
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Refereed?: Yes, Invited?: No
72. G. Torabi*, A. Hammad, and N. Bouguila. (2021). Joint Detection and Activity Recognition of Construction Workers using Convolutional Neural Networks. European Conference on Computing in Construction (2021 EC3), (212-219)
Conference Date: 2021/7
Paper
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Refereed?: Yes, Invited?: No
73. M. Amirkhani*, N. Manouchehri* and N. Bouguila. (2021). Birth-Death MCMC Approach for Multivariate Beta Mixture Models in Medical Applications. Lecture Notes in Computer Science 12798, Springer. 34th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2021), (285-296)
Conference Date: 2021/7
Paper
Published
Refereed?: Yes, Invited?: No
74. O. Graja*, F. Najar*, M. Amayri, and N. Bougu. (2021). Inverted Dirichlet State Space Model for Time Series Forecasting. IEEE. IEEE International Symposium on Industrial Electronics, (1-6)
Conference Date: 2021/6
Paper
Published
Refereed?: Yes, Invited?: No
75. N. Manouchehri*, O. Dalhoumi*, M. Amayri, and N. Bouguila. (2021). Online Variational Learning of Shifted Scaled Dirichlet Mixture. AAAI. IEEE International Symposium on Industrial Electronics (ISIE 2021),
Conference Date: 2021/6
Paper
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Refereed?: Yes, Invited?: No

76. X. Su*, N. Zamzami and N. Bouguila. (2021). Covid-19 News Clustering using MCMC-Based learning of Finite EMSD Mixture Models. AAAI. 34rd International Conference of the Florida Artificial Intelligence Research Society,
Conference Date: 2021/5
Paper
Published
Refereed?: Yes, Invited?: No
77. M. S. Ahmadzadeh*, N. Manouchehri*, H. Ennajari*, M. Amayri, N. Bouguila and W. Fan. (2021). Entropy-Based Variational Learning of Finite Inverted Beta-Liouville Mixture Models. AAAI. 34rd International Conference of the Florida Artificial Intelligence Research Society (FLAIRS-34),
Conference Date: 2021/5
Paper
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Refereed?: Yes, Invited?: No
78. S. Hannachi*, F. Najar* and N. Bouguila. (2021). Short Text Clustering using Generalized Dirichlet Multinomial Mixture Model. Lecture Notes in Communications in Computer and Information Science 1371, Springer. 13th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2021), (149-161)
Conference Date: 2021/4
Paper
Published
Refereed?: Yes, Invited?: No
79. X. Sumba*, N. Zamzami* and N. Bouguila. (2021). Clustering Count Data with Stochastic Expectation Propagation. Lecture Notes in Computer Sciences 12672, Springer. 13th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2021), (119-129)
Conference Date: 2021/4
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Refereed?: Yes, Invited?: No
80. O. Bregu*, N. Zamzami and N. Bouguila. (2021). Mixture-Based Unsupervised Learning for Positively Correlated Count Data. Lecture Notes in Computer Sciences 12672, Springer. 13th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2021), (144-154)
Conference Date: 2021/4
Paper
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Refereed?: Yes, Invited?: No
81. M. S. Ahmadzadeh*, N. Manouchehri* and N. Bouguila. (2021). Entropy-Based Variational Learning of Finite Inverted Dirichlet Mixture Model. Lecture Notes in Computer Sciences 12672, Springer. Asian Conference on Intelligent Information and Database Systems (ACIIDS 2021), (130-143)
Conference Date: 2021/4
Paper
Published
Refereed?: Yes, Invited?: No
82. M. Azam*, J. Singh* and N. Bouguila. (2021). Spatial Image Segmentation Based on Beta-Liouville Mixture Models and Markov Random Field. IEEE. 22nd IEEE International Conference on Industrial Technology (IEEE ICIT 2021), (936-941)
Conference Date: 2021/3
Paper
Published
Refereed?: Yes, Invited?: No

83. Y. Pawar*, M. Amayri and N. Bouguila. (2021). Performance Evaluation of Adversarial Learning for Anomaly Detection using Mixture Models. IEEE. 22nd IEEE International Conference on Industrial Technology, (913-918)
Conference Date: 2021/3
Paper
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Refereed?: Yes, Invited?: No
84. F. Najar*, S. Bourouis, M. Alshar'e, R. Alroobaea, N. Bouguila, A. H. Al Badi and I. Channoufi. (2020). Efficient Statistical Learning Framework with Applications to Human Activity and Facial Expression Recognition. International Conference on Advanced Technologies for Signal & Image Processing (ATSIP'2020),
Paper
Accepted
Refereed?: Yes, Invited?: No
85. V. K. Ghassab*, K. Maanicshah*, P. Green and N. Bouguila. (2020). REP-Model: A deep learning framework for replacing ad billboards in soccer videos. IEEE. IEEE International Symposium on Multimedia (IEEE ISM), (149-153)
Conference Date: 2020/12
Paper
Published
Refereed?: Yes, Invited?: No
86. F. Alalyan*, N. Zamzami* and N. Bouguila. (2020). A Hybrid Approach Based on SVM and Bernoulli Mixture Model for Binary Vectors Classification. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (1155-1160)
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
87. Y. P. Pawar*, N. Zamzami* and N. Bouguila. (2020). An Effective Hybrid Anomaly Detection System Based on Mixture Models. IEEE. International Symposium on Networks, Computers and Communications (ISNCC), (1-6)
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
88. M. H. Rahman* and N. Bouguila. (2020). Probabilistic Features on Simplex Manifold in Predictive Data Modelling. IEEE. International Symposium on Networks, Computers and Communications (ISNCC), (1-6)
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
89. P. Koochemeshkian*, N. Zamzami* and N. Bouguila. (2020). Distribution-Based Regression Models for Semi-Bounded Data Analysis. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (4073-4080)
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No

90. M. Haddad*, V. K. Ghassab*, F. Najar* and N. Bouguila. (2020). Instance-Based learning for Human Action Recognition. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (147-153)
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
91. P. Koochemeshkian*, N. Manouchehri* and N. Bouguila. (2020). Bivariate Beta Regression Models and Its Medical Applications. IEEE. International Symposium on Networks, Computers and Communications (ISNCC),
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
92. S. Ali* and N. Bouguila. (2020). Maximum A Posteriori Approximation of Dirichlet and Beta-Liouville Hidden Markov Models for Proportional Sequential Data Modeling. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (4081-4087)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
93. Y. P. Pawar*, M. Amayri and N. Bouguila. (2020). Performance Evaluation of Geometric Area Analysis Technique for Anomaly Detection Using Trapezoidal Area Estimation. IEEE. International Symposium on Networks, Computers and Communications (ISNCC), (1-6)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
94. M. H. Rahman* and N. Bouguila. (2020). Inverted Dirichlet and Related Distributions Based Feature Mapping for Data Classification. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (3588-3593)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
95. S. Amudala*, S. Ali* and N. Bouguila. (2020). Variational Inference of Infinite Generalized Gaussian Mixture Models with Feature Selection. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (120-127)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
96. F. Najar* and N. Bouguila. (2020). Image Categorization using Agglomerative Clustering Based Smoothed Dirichlet Mixtures. Lecture Notes in Computer Science, Vol. 12510, Springer. 15th International Symposium on Visual Computing (ISVC 2020), (27-38)
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97. S. Ali* and N. Bouguila. (2020). Online Learning for Beta-Liouville Hidden Markov Models: Incremental Variational Learning for Video Surveillance and Action Recognition. IEEE. IEEE International Conference on Image Processing (IEEE ICIP), (3249-3253)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
98. F. Najar*, N. Zamzami* and N. Bouguila. (2020). Recognition of Human Interactions in Feature Films based on Infinite Mixture of EDCM. IEEE. International Symposium on Networks, Computers and Communications (ISNCC), (1-6)
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Refereed?: Yes, Invited?: No
99. O. Graja*, F. Najar* and N. Bouguila. (2020). Generalized Inverted Dirichlet Optimal Predictor for Image Inpainting. Lecture Notes in Computer Science, Vol. 12509, Springer. 15th International Symposium on Visual Computing (ISVC 2020), (410-421)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
100. N. Manouchehri*, O. Dalhoumi*, M. Amayri* and N. Bouguila. (2020). Variational Learning of a Shifted Scaled Dirichlet Model with Component Splitting Approach. IEEE. IEEE International Conference on Artificial Intelligence for Industries (AI4I), (75-78)
Conference Date: 2020/9
Paper
Published
Refereed?: Yes, Invited?: No
101. S. Ali* and N. Bouguila. (2020). On Maximum A Posteriori Approximation of Hidden Markov Models for Proportional Data. IEEE. IEEE 22nd International Workshop on Multimedia Signal Processing (IEEE MMSP), (1-6)
Conference Date: 2020/9
Paper
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Refereed?: Yes, Invited?: No
102. N. Zamzami*, P. Koochemeshkian* and N. Bouguila. (2020). A Distribution-Based Regression for Real-Time COVID-19 Cases Detection from Chest X-Ray and CT Image. IEEE. IEEE 21st International Conference on Information Reuse and Integration for Data Science (IRI2020), (104-111)
Conference Date: 2020/8
Paper
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Refereed?: Yes, Invited?: No
103. M. Amirkhani*, N. Manouchehri* and N. Bouguila. (2020). Fully Bayesian Learning of Multivariate Beta Mixture Models. IEEE. IEEE 21st International Conference on Information Reuse and Integration for Data Science (IRI2020), (120-127)
Conference Date: 2020/8
Paper
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Refereed?: Yes, Invited?: No

104. S. Amudala*, S. Ali* and N. Bouguila. (2020). Background Subtraction with a Hierarchical Pitman-Yor Process Mixture Model of Generalized Gaussian Distributions. IEEE. IEEE 21st International Conference on Information Reuse and Integration for Data Science (IRI2020), (112-119)
Conference Date: 2020/8
Paper
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Refereed?: Yes, Invited?: No
105. X. Sumba*, N. Zamzami* and N. Bouguila. (2020). Improving the EDCM Mixture Model with Expectation Propagation. AAAI. 33rd International FLAIRS Conference (FLAIRS-33),
Conference Date: 2020/5
Paper
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Refereed?: Yes, Invited?: No
106. M. Rasti*, N. Manouchehri* and N. Bouguila. (2020). MCMC-Based Learning of Finite Bivariate Beta Mixture Models. AAAI. 33rd International FLAIRS Conference (FLAIRS-33), (621-624)
Conference Date: 2020/5
Paper
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Refereed?: Yes, Invited?: No
107. F. Najar* and N. Bouguila. (2020). Happiness Analysis with Fisher Information of Dirichlet-Multinomial Mixture Model. Lecture Notes in Computer Science 12109, Springer. 33rd Canadian Conference on Artificial Intelligence (Canadian AI 2020), (438-444)
Conference Date: 2020/5
Paper
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Refereed?: Yes, Invited?: No
108. X. Sumba* and N. Bouguila. (2020). Improving Classification using Topic Correlation and Expectation Propagation. Lecture Notes in Computer Science 12109. 33rd Canadian Conference on Artificial Intelligence (Canadian AI 2020), (496-507)
Conference Date: 2020/5
Paper
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Refereed?: Yes, Invited?: No
109. M. Daghyani*, N. Zamzami* and N. Bouguila. (2019). Efficient Computation of Log-likelihood Function in Clustering Overdispersed Count Data using Multinomial-Beta Liouville Distribution. IEEE. IEEE Symposium Series on Computational Intelligence, (986-993)
Conference Date: 2020/12
Paper
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Refereed?: Yes, Invited?: No
110. M. H. Rahman* and N. Bouguila. (2019). Distribution Based Feature Mapping for Classifying Count Data. IEEE. IEEE Symposium Series on Computational Intelligence, (2440-2447)
Conference Date: 2019/12
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Refereed?: Yes, Invited?: No

111. Y. Zhang, W. Fan and N. Bouguila. (2019). Unsupervised Image Categorization Based on Variational Autoencoder and Student's-T Mixture Model. IEEE. IEEE Symposium Series on Computational Intelligence, (2403-2400)
Conference Date: 2019/12
Paper
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Refereed?: Yes, Invited?: No
112. Z. Song*, O. Bregu*, S. Ali*, and N. Bouguila. (2019). Variational Inference for Finite Asymmetric Gaussian Mixture Models. IEEE. IEEE Symposium Series on Computational Intelligence, (2448-2454)
Conference Date: 2019/12
Paper
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Refereed?: Yes, Invited?: No
113. M. Amayri*, F. Najar*, N. Bouguila, S. Ploix and F. Wurtz. (2019). A Statistical Process Control Chart Approach for Occupancy Estimation in Smart Buildings. IEEE. IEEE Symposium Series on Computational Intelligence, (1729-1734)
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No
114. N. Manouchehri*, M. Rahmanpour, N. Bouguila and W. Fan. (2019). Learning of Multivariate Beta Mixture Models via Entropy-Based Component Splitting. IEEE. IEEE Symposium Series on Computational Intelligence, (2825-2832)
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No
115. S. Amudala*, S. Ali*, F. Najar* and N. Bouguila. (2019). Variational Inference of Finite Generalized Gaussian Mixture Models. IEEE. IEEE Symposium Series on Computational Intelligence, (2433-2439)
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No
116. S. Ali* and N. Bouguila. (2019). Hybrid Generative-Discriminative Generalized Dirichlet-based Hidden Markov Models and Support Vector Machines. IEEE. IEEE International Symposium on Multimedia, (231-234)
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No
117. V. K. Ghassab* and N. Bouguila. (2019). An Embedding Framework for Video Reconstruction using Gaussian Mixture Models. IEEE. IEEE Global Conference on Signal and Information Processing, (1-5)
Conference Date: 2019/11
Paper
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Refereed?: Yes, Invited?: No

118. O. Graja* and N. Bouguila. (2019). Finite Inverted Dirichlet Mixture Optimal Pixel Predictor. IEEE. IEEE Global Conference on Signal and Information Processing, (1-5)
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
119. N. Manouchehri*, H. Nguyen*, and N. Bouguila. (2019). Component Splitting-Based Approach for Multivariate Beta Mixture Models Learning. IEEE. IEEE Global Conference on Signal and Information Processing, (1-5)
Conference Date: 2019/10
Paper
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Refereed?: Yes, Invited?: No
120. N. Zamzami* and N. Bouguila. (2019). An Accurate Evaluation of MSD Log-Likelihood and its Application in Human Action Recognition. IEEE. IEEE Global Conference on Signal and Information Processing, (1-5)
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
121. S. Ali* and N. Bouguila. (2019). Dynamic Texture Recognition using a Hybrid Generative-Discriminative Approach with Hidden Markov Models and Support Vector Machines. IEEE. IEEE Global Conference on Signal and Information Processing, (1-5)
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
122. H. Nguyen*, M. Rahmanpour*, N. Manouchehri*, K. Mannichah*, M. Amayri, and N. Bouguila. (2019). A Statistical Approach for Unsupervised Occupancy Detection and Estimation in Smart Buildings. IEEE. IEEE International Smart Cities Conference, (414-419)
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
123. K. Mannichah*, S. Ali*, W. Fan, and N. Bouguila. (2019). Unsupervised Variational Learning of Finite Generalized Inverted Dirichlet Mixture Models with Feature Selection and Component Splitting. Lecture Notes in Computer Science 11662. 16th International Conference on Image Analysis and Recognition, (94-105)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
124. M. Azam* and N. Bouguila. (2019). Texture Image Categorization in Wavelet Domain Via Naïve Bayes Classifier Based on Laplace and Generalized Gaussian Distribution. IEEE. IEEE 20th International Conference on Information Reuse and Integration for Data Science, (143-150)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No

125. H. Nguyen*, M. Kalra*, M. Azam*, and N. Bouguila. (2019). Data Clustering using Online Variational Learning of Finite Scaled Dirichlet Mixture Models. IEEE. IEEE 20th International Conference on Information Reuse and Integration for Data Science, (267-274)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
126. F. Najar*, N. Zamzami*, and N. Bouguila. (2019). Fake News Detection using Bayesian Inference. IEEE. IEEE 20th International Conference on Information Reuse and Integration for Data Science, (389-394)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
127. Z. Song*, S. Ali*, and N. Bouguila. (2019). Bayesian Learning of Infinite Asymmetric Gaussian Mixture Models for Background Subtraction. Lecture Notes in Computer Science 11662, Springer. International Conference on Image Analysis and Recognition, (264-274)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
128. H. Nguyen*, K. Mannichah*, M. Azam*, and N. Bouguila. (2019). Data Clustering using Variational Learning of Finite Scaled Dirichlet Mixture Models with Component Splitting. Lecture Notes in Computer Science 11662. 16th International Conference on Image Analysis and Recognition, (94-105)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
129. F. Al-Alyan*, N. Zamzami*, and N. Bouguila. (2019). Model-Based Hierarchical Clustering for Categorical Data. IEEE. IEEE International Symposium on Industrial Electronics, (1424-1429)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
130. J. S. Kalsi* and N. Bouguila. (2019). Color Image Segmentation using Generalized Inverted Dirichlet Finite Mixture Models By Integrating Spatial Information. IEEE. IEEE International Symposium on Industrial Electronics, (1379-1384)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
131. S. Ali* and N. Bouguila. (2019). Variational Learning of Beta-Liouville Hidden Markov Models for Infrared Action Recognition. IEEE. 15th IEEE Workshop on Perception Beyond the Visible Spectrum, (898-906)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No

132. N. Zamzami*, M. Amayri*, N. Bouguila, and S. Ploix. (2019). Online Clustering for Estimating Occupancy in an Office Setting. IEEE. IEEE International Symposium on Industrial Electronics, (2195-2200)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
133. N. Manouchehri*, J. S. Kalsi*, M. Amayri*, and N. Bouguila. (2019). Finite Two-Dimensional Beta Mixture Model Selection and Applications. IEEE. IEEE International Symposium on Industrial Electronics, (1407-1412)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
134. D-H. Nguyen*, M. Azam*, and N. Bouguila. (2019). Data Clustering using Variatioanl Learning of Finite Scaled Dirichlet Mixture Models. IEEE. IEEE International Symposium on Industrial Electronics, (1391-1396)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
135. K. Mannichah*, N. Bouguila, and W. Fan. (2019). Variational Learning of Finite Generalized Inverted Dirichlet Mixture Models with a Component Splitting Approach. IEEE. IEEE International Symposium on Industrial Electronics, (1453-1458)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
136. D. Ankam* and N. Bouguila. (2019). Generalized Dirichlet Regression and other Compositional Models with Application to Market-Share Data Mining of Information Technology Companies. International Conference on Enterprise Information Systems, (158-166)
Conference Date: 2019/5
Paper
Published
Refereed?: Yes, Invited?: No
137. N. Manouchehri* and N. Bouguila. (2019). A Probabilistic Approach Based on a Finite Mixture Model of Multivariate Beta Distributions. International Conference on Enterprise Information Systems, (373-380)
Conference Date: 2019/5
Paper
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Refereed?: Yes, Invited?: No
138. F. Alalyan*, N. Zamzami*, M. Amayri*, and N. Bouguila. (2019). An Improved K-Medoids Algorithm Based on Binary Sequences Similarity Measures. IEEE. International Conference on Control, Decision and Information Technologies, (1723-1728)
Conference Date: 2019/4
Paper
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Refereed?: Yes, Invited?: No

139. D. Ankam*, N. Bouguila, and M. Amayri*. (2019). Beta-Liouville Regression and Applications. IEEE. International Conference on Control, Decision and Information Technologies, (1740-1745)
Conference Date: 2019/4
Paper
Published
Refereed?: Yes, Invited?: No
140. I. Channoufi*, S. Bourouis, N. Bouguila, K. Hamrouni. (2018). Color Image Segmentation with Bounded Generalized Gaussian Mixture Model and Feature Selection. 4th International Conference on Advanced Technologies for Signal & Image Processing (ATSIP'2018),
Paper
Published
Refereed?: Yes, Invited?: No
141. B. Alghabashi* and N. Bouguila. (2018). Finite Multi-Dimensional Generalized Gamma Mixture Model Learning Based on MML. IEEE. IEEE 17h International Conference on Machine Learning and Applications, (1131-1138)
Conference Date: 2018/12
Paper
Published
Refereed?: Yes, Invited?: No
142. M. Azam* and N. Bouguila. (2018). Bounded Laplace Mixture Model with Applications to Image Clustering and Content Based Image Retrieval. IEEE. IEEE 17h International Conference on Machine Learning and Applications, (558-563)
Conference Date: 2018/12
Paper
Published
Refereed?: Yes, Invited?: No
143. S. Fu* and N. Bouguila. (2018). Asymmetric Gaussian-Based Statistical Models Using Markov Chain Monte Carlo Techniques for Image Categorization. IEEE. IEEE 17h International Conference on Machine Learning and Applications, (1205-1208)
Conference Date: 2018/12
Paper
Published
Refereed?: Yes, Invited?: No
144. R. Alsuroji*, N. Zamzami*, and N. Bouguila. (2018). Model Selection and Estimation of a Finite Shifted-Scaled Dirichlet Mixture Model. IEEE. IEEE 17h International Conference on Machine Learning and Applications, (707-713)
Conference Date: 2018/12
Paper
Published
Refereed?: Yes, Invited?: No
145. J. Fu, W. Fan, and N. Bouguila. (2018). A Novel Approach for Anomaly Event Detection in Videos Based on Autoencoders and SE Networks. IEEE. International Symposium on Signal, Image, Video and Communications, (179-184)
Conference Date: 2018/11
Paper
Published
Refereed?: Yes, Invited?: No

146. N. Manouchehri* and N. Bouguila. (2018). Learning of Finite Two-Dimensional Beta Mixture Models. IEEE. International Symposium on Signal, Image, Video and Communications, (227-232)
Conference Date: 2018/11
Paper
Published
Refereed?: Yes, Invited?: No
147. Y. Chen, L. Zhou, N. Bouguila, F. Wu, J. Du, C. Wang, and H. Li. (2018). Semi-Convex Hull Tree: Fast Nearest Neighbor Queries for Large Scale Data on GPUs. IEEE. IEEE International Conference on Data Mining, (911-916)
Conference Date: 2018/11
Paper
Published
Refereed?: Yes, Invited?: No
148. O. Graja*, N. Bouguila, and M. Azam*. (2018). Breast Cancer Diagnosis using Quality Control Charts and Logistic Regression. IEEE. International Symposium on Signal, Image, Video and Communications, (215-220)
Conference Date: 2018/11
Paper
Published
Refereed?: Yes, Invited?: No
149. R. Alsuroji*, N. Bouguila, and N. Zamzami*. (2018). Predicting Defect-Prone Software Modules Using Shifted-Scaled Dirichlet Distribution. IEEE. IEEE International Conference on Artificial Intelligence for Industries, (703-713)
Conference Date: 2018/9
Paper
Published
Refereed?: Yes, Invited?: No
150. N. Zamzami* and N. Bouguila. (2018). Consumption Behavior Prediction using Hierarchical Bayesian Frameworks. IEEE. IEEE International Conference on Artificial Intelligence for Industries, (703-713)
Conference Date: 2018/9
Paper
Published
Refereed?: Yes, Invited?: No
151. K. Ihou* and N. Bouguila. (2018). A Smoothed Latent Generalized Dirichlet Allocation Model in the Collapsed Space. IEEE. IEEE International Midwest Symposium on Circuits and Systems, (877-880)
Conference Date: 2018/8
Paper
Published
Refereed?: Yes, Invited?: No
152. M. Azam* and N. Bouguila. (2018). Speaker Verification Using Adapted Bounded Gaussian Mixture Model. IEEE. IEEE 19th Conference on Information Reuse and Integration for Data Science, (300-307)
Conference Date: 2018/8
Paper
Published
Refereed?: Yes, Invited?: No

153. D. Ankam* and N. Bouguila. (2018). Compositional Data Analysis with PLS-DA and Security Applications. IEEE. IEEE 19th Conference on Information Reuse and Integration for Data Scienc, (338-345)
Conference Date: 2018/8
Paper
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Refereed?: Yes, Invited?: No
154. M. Azam* and N. Bouguila. (2018). Blind Source Separation as Pre-processing to Unsupervised Keyword Spotting Via an ICA Mixture Model. IEEE. IEEE International Midwest Symposium on Circuits and Systems, (833-836)
Conference Date: 2018/8
Paper
Published
Refereed?: Yes, Invited?: No
155. B. Alghabashi* and N. Bouguila. (2018). A Finite multi-dimensional generalized Gamma Mixture Model. IEEE. IEEE Conference on Smart Data, (807-814)
Conference Date: 2018/7
Paper
Published
Refereed?: Yes, Invited?: No
156. I. Channoufi*, S. Bourouis, N. Bouguila, K. Hamrouni. (2018). Spatially Constrained Mixture Model with Feature Selection for Image and Video Segmentation. Lecture Notes in Computer Science 10884, sPRINGER. International Conference on Image and Signal Processing, (36-44)
Conference Date: 2018/7
Paper
Published
Refereed?: Yes, Invited?: No
157. F. Aldosari, S. Bourouis, N. Bouguila, H. Sallay, K. M. J. Khayyat. (2018). Infinite Scaled Dirichlet Mixture Models for Spam Filtering Via Bayesian and Variational Bayes Learning. IEEE. IEEE International Conference on Computer and Information Technology, (1841-1847)
Conference Date: 2018/7
Paper
Published
Refereed?: Yes, Invited?: No
158. S. Bourouis, N. Bouguila, Y. Li*, and M. Azam*. (2018). Visual Scene Reconstruction using a Bayesian Learning Framework. Lecture Notes in Computer Science 10884, Springer. International Conference on Image and Signal Processing, (225-232)
Conference Date: 2018/7
Paper
Published
Refereed?: Yes, Invited?: No
159. Zamzami* and N. Bouguila. (2018). Text modeling Using Multinomial Scaled Dirichlet Distributions. Lecture Notes in Computer Science 10868, Springer. International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems, (69-80)
Conference Date: 2018/6
Paper
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Refereed?: Yes, Invited?: No

160. I. Channoufi*, S. Bourouis, N. Bouguila, K. Hamrouni. (2018). A Flexible Statistical Model for Image Denoising. Lecture Notes in Computer Science 10882, Springer. International Conference on Image Analysis and Recognition, (30-38)
Conference Date: 2018/6
Paper
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Refereed?: Yes, Invited?: No
161. W. Fan and N. Bouguila. (2018). An Accelerated Variational Framework for Face Expression Recognition. IEEE. IEEE International Black Sea Conference on Communication and Networking, (1-5)
Conference Date: 2018/6
Paper
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Refereed?: Yes, Invited?: No
162. S. Bourouis, A. Zaguia, and N. Bouguila. (2018). Hybrid Statistical Framework for Diabetic Retinopathy Detection. Lecture Notes in Computer Science 10882, Springer. International Conference on Image Analysis and Recognition, (687-694)
Conference Date: 2018/6
Paper
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Refereed?: Yes, Invited?: No
163. F. Najar*, S. Bourouis, A. Zaguia, N. Bouguila, and S. Belgith. (2018). Unsupervised Human Action Categorization Using A Riemannian Averaged Fixed-Point Learning of Multivariate GGMM. Lecture Notes in Computer Science 10882, Springer. 15th International Conference on Image Analysis and Recognition, (408-415)
Conference Date: 2018/6
Paper
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Refereed?: Yes, Invited?: No
164. S. Fu* and N. Bouguila. (2018). An Intrusion Detection Model Based on Asymmetric Gaussian Mixtures with Reversible Jump MCMC. IEEE. International Conference on Cyber Security and Protection of Digital Services, (1-8)
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
165. W. Fan, S. Bourouis, N. Bouguila, F. Aldosari, H. Sallay and K. M. J. Khayyat. (2018). EP-Based Infinite Inverted Dirichlet Mixture Learning: Application to Image Spam Detection. Lecture Notes in Computer Science 10868, Springer. International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems, (342-354)
Conference Date: 2018/6
Paper
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Refereed?: Yes, Invited?: No
166. S. Fu* and N. Bouguila. (2018). Bayesian Learning of Finite Asymmetric Gaussian Mixtures. Lecture Notes in Computer Science 10868, Springer. International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems, (355-365)
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No

167. F. Najar*, S. Bourouis, N. Bouguila, and S. Belghith. (2018). A Fixed-Point Estimation Algorithm for Learning the Multivariate GGMM: Application to Human Action Recognition. IEEE. IEEE 31st Canadian Conference on Electrical and Computer Engineering, (1-4)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No
168. S. Fu* and N. Bouguila. (2018). Asymmetric Gaussian Mixtures with Reversible Jump MCMC. IEEE. IEEE 31st Canadian Conference on Electrical and Computer Engineering, (1-4)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No
169. N. Zamzami* and N. Bouguila. (2018). MML-Based Approach for Determining the Number of Topics in EDCM Mixture Models. Lecture Notes in Computer Science 10832, Springer. Canadian conference on Artificial Intelligence, (211-217)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No
170. J. Singh* and N. Bouguila. (2018). Spatially Constrained Inverted Dirichlet Mixture Model for Image Segmentation. IEEE. IEEE 31st Canadian Conference on Electrical and Computer Engineering, (1-4)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No



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Protected when completed

Professor Jeremy William Clark

Correspondence language: English

Contact Information

The primary information is denoted by (*)

Address

Home (*)

115 Flordia Drive
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Telephone

Home	1-514-4734211
Work (*)	1-514-8482424 extension: 5381

Email

Personal	pulpspy@gmail.com
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Professor Jeremy Clark

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes

Degrees

- 2013/8 Post-doctorate, Computer Science, Carleton University
Supervisors: Paul C. van Oorschot, 2011/7 - 2013/8
- 2011/6 Doctorate, Computer Science, University of Waterloo
Supervisors: Urs Hengartner, 2007/9 - 2011/6
- 2007/10 Master's Thesis, Electrical Engineering, University of Ottawa
Supervisors: Carlisle Adams, 2005/9 - 2007/10
- 2004/4 Bachelor's Honours, Computer Engineering, University of Western Ontario

Recognitions

- 2017/5 Excellence in Teaching Award
Concordia University
Prize / Award
Excellence in Teaching Award, Junior Faculty Member, Faculty (ENCS) level

User Profile

Research Specialization Keywords: Blockchain technology, End-to-end verifiable voting systems

Employment

- 2018/6 Associate Professor
CIISE, Gina Cody School of Engineering and Computer Science, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2013/8 - 2018/5 Assistant Professor
Concordia Institute for Information Systems Engineering, Faculty of Engineering and Computer Science, Concordia University
Full-time, Assistant Professor
Tenure Status: Tenure Track

2014/11 - 2015/9 Subject Matter Expert on Internet Voting Security
Election Services, City of Toronto

Leaves of Absence and Impact on Research

2019/11 - 2020/6 Parental, Concordia University
Reduced research output in 2020.

Research Funding History

Awarded [n=8]

Co-investigator The Human-Centric Cybersecurity Partnership (HC2P), Grant

2021/5 - 2026/4 Discovery Grant, Grant

Principal Investigator

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery Grant

Total Funding - 125,000

Portion of Funding Received - 100

Funding Competitive?: Yes

2021/5 - 2026/4 Discovery Grant, Grant

Principal Investigator

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Total Funding - 175,000

Portion of Funding Received - 100

Funding Competitive?: Yes

2019/11 - 2025/6 NSERC / Raymond Chabot Grant Thornton / Catallaxy Industrial Research Chair on
Principal Investigator Blockchain Technologies, Research Chair

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Industrial Research Chair

Total Funding - 1,470,000

Portion of Funding Received - 100

Funding Competitive?: Yes

2018/2 - 2020/1 Understanding Blockchains through Experimentation, Grant

Principal Investigator

Funding Sources:

Autorité des marchés financiers

Education and Good Governance Fund (EGGF)

Total Funding - 200,000

Portion of Funding Received - 50

Funding Competitive?: Yes

Co-investigator : Emilio Boulianne

2015/4 - 2017/3 Vote par Internet : des technologies favorisant la démocratie / Democracy Enhancing
Principal Applicant Technologies for Internet Voting, Grant

Funding Sources:

Fonds de recherche du Québec - Nature et technologies (FRQNT)

Nouveaux chercheurs

Total Funding - 38,000

Portion of Funding Received - 100

	Funding Competitive?: Yes
2015/5 - 2016/3 Co-applicant	Certificate Authority Report Card: Examining the Root of Data Protection on the Web, Grant Funding Sources: Office of the Privacy Commissioner of Canada Contributions Program Total Funding - 50,000 Portion of Funding Received - 50 Funding Competitive?: Yes Co-investigator : Mohammad Mannan
2013/8 - 2015/4 Principal Applicant	Start-up Grant, Grant Funding Sources: Concordia University Total Funding - 50,000 Portion of Funding Received - 50,000 Funding Competitive?: No

Student/Postdoctoral Supervision

Master's Thesis [n=10]

Principal Supervisor	Youwei Deng (In Progress) Thesis/Project Title: Topic: applications of succinct zero knowledge proofs
2021/5 - 2022/9 Co-Supervisor	Sina Pilehchiha (Completed) , Concordia University Thesis/Project Title: Improving Reproducibility in Smart Contract Research Present Position: Software Engineer, Quantstamp
2020/1 - 2022/4 Co-Supervisor	Mehdi Salehi (Completed) , Concordia University Thesis/Project Title: An Analysis of Upgradeability, Oracles, and Stablecoins in the Ethereum Blockchain Present Position: Integration Engineer, Offchain Labs
2019/9 - 2020/8 Co-Supervisor	Corentin Thomasset (Completed) , Polytechnique Montréal Thesis/Project Title: "SERENIoT : Politiques de sécurité collaboratives pour maisons connectées"
2019/9 - 2022/12 Principal Supervisor	Mehdi Nejadgholi (Completed) , Concordia University Thesis/Project Title: Nullification, a coercion-resistance add-on for e-voting protocols
2016/5 - 2017/12 Principal Supervisor	Chidinma Okoye (Completed) , Concordia University Thesis/Project Title: "New applications of blockchain technology to voting and lending" Present Position: Developer, Deloitte
2015/9 - 2018/4 Principal Supervisor	Seyedehmahsa Moosavi (Completed) , Concordia University Thesis/Project Title: "Rethinking Certificate Authorities: Understanding and decentralizing domain validation" Present Position: PhD Student, Concordia University
2014/9 - 2018/8 Principal Supervisor	Michael Colburn (Completed) , Concordia University Thesis/Project Title: "Short-Lived Signatures" Present Position: Engineer, Trail of Bits

2014/9 - 2017/8
Co-Supervisor
Abhimanyu Khanna (Completed) , Concordia University
Thesis/Project Title: TLS Proxy with Improved Security Assurances
Present Position: Lead Penetration Tester, KPMG

2013/12 - 2014/8
Co-Supervisor
Shayan Eskandari (Completed) , Concordia University
Thesis/Project Title: Real world deployability and usability of Bitcoin
Present Position: Chief Technology Officer (CTO), Ether Capital

Doctorate [n=7]

2018/9
Principal Supervisor
Mohammadreza Rahimian (In Progress) , Concordia University
Thesis/Project Title: Topic: Validating Smart Contracts on Ethereum (Part-time student)
Present Position: Senior System Administrator, Societe Generale Corporate and Investment Banking

2018/5
Principal Supervisor
Seyedehmahsa Moosavi (In Progress) , Concordia University
Thesis/Project Title: Topic: Decentralized finance and market microstructures
Present Position: PhD Student, Concordia University

2018/1 - 2022/12
Principal Supervisor
Didem Demirag (Completed) , Concordia University
Thesis/Project Title: Moving Multiparty Computation Forward for the Real World
Present Position: Post Doctoral Fellow, UQAM

2017/9
Principal Supervisor
Shayan Eskandari (In Progress) , Concordia University
Thesis/Project Title: Topic: Understanding and Mitigating Criminal and Unethical Blockchain Activities
Present Position: PhD Student / Engineer, Concordia University / ConsenSys Diligence

2017/5
Co-Supervisor
Pratyusha Bhattacharya (In Progress) , Concordia University
Thesis/Project Title: Topic: Smart Grid Applications for Blockchain Technology
Present Position: PhD Student, Concordia University

2014/8 - 2021/3
Co-Supervisor
Nan Yang (Completed) , Concordia University
Thesis/Project Title: Non-local contamination in cryptography
Present Position: Cryptographer, Government of Canada

2013/10 - 2015/5
Co-Supervisor
Gaby Dagher (Completed) , Concordia University
Thesis/Project Title: Toward secure and privacy-preserving data sharing and integration
Present Position: Assistant Professor, Boise State University

Post-doctorate [n=1]

2018/1 - 2018/9
Principal Supervisor
Elizabeth Stobert (Completed) , Concordia University
Thesis/Project Title: Topic: Usable Security
Present Position: Faculty, Carleton University

Event Administration

2019/7 - 2020/9
General Chair, The 20th Privacy Enhancing Technologies Symposium, Conference, 2020/7 - 2020/7

2018/9 - 2018/5
Program Chair, 3rd Workshop on Advances in Secure Electronic Voting, Financial Cryptography 2018, Workshop, 2018/3 - 2018/3

2016/9 - 2017/4
Chair, SERENE-RISC Spring 2017 Workshop, The Smart Cybersecurity Network (SERENE-RISC), Networks of Centers of Excellence, Workshop, 2017/4 - 2017/4

2015/9 - 2016/4
Program Chair, 3rd Workshop on Bitcoin and Blockchain Research, Financial Cryptography 2016, Workshop, 2016/2 - 2016/2

2015/9 - 2016/4 Program Chair, 4th Workshop on Advances in Secure Electronic Voting, Financial Cryptography 2019, Workshop, 2019/2 - 2019/2

Editorial Activities

2020/4 - 2020/4 Editor, Bracciali, A., Clark, J., Pintore, F., Roenne, P., Sala, M. (Editors). "Financial Cryptography and Data Security: FC Workshops 2019." Lecture Notes in Computer Science (LNCS) 11599. Springer, 2020., Book

2019/2 - 2019/2 Editor, A. Zohar, I. Eyal, V. Teague, J. Clark, A. Bracciali, F. Pintore, M. Sala (Editors). "Financial Cryptography and Data Security: FC Workshops 2017." LNCS 10958, Springer., Book

2016/9 - 2016/9 Editor, J. Clark, S. Meiklejohn, P.Y.A.Ryan, D. Wallach, M. Brenner, K. Rohloff (Editors). "Financial Cryptography and Data Security: FC Workshops 2016." LNCS 9604, Springer, Book

2013/4 - 2015/8 Editorial Board, USENIX Journal of Election Technology and Systems (JETS); defunct as of 2015, Journal

Knowledge and Technology Translation

2019/11 - 2019/11 Subject Matter Expert, Citizen Engagement
Group/Organization/Business Serviced: Elections Quebec
Target Stakeholder: Policy Maker/Regulator
Outcome / Deliverable: Citizen jury on internet voting organized by Institut du Nouveau Monde (INM) for Elections Quebec. Final policy report published.
Evidence of Uptake/Impact: Consistent with the position I argued: "The 12 members of the Citizen round table recommended that Internet voting should not be implemented in the short term, due to the related risks."
References / Citations / Web Sites: <https://www.electionsquebec.qc.ca/english/researchers/internet-voting.php>

2019/1 - 2019/1 Subject Matter Expert, Policy/Regulation Development
Group/Organization/Business Serviced: Lotto-Quebec
Target Stakeholder: Policy Maker/Regulator
Outcome / Deliverable: Individual consultation on gambling applications on blockchain
Evidence of Uptake/Impact: Unknown

2016/9 - 2018/9 Subject Matter Expert, Standards Development
Group/Organization/Business Serviced: Standards Council of Canada
Target Stakeholder: Industrial Consortium
Outcome / Deliverable: SMC/ISO/TC 307: Blockchain and electronic distributed ledger technologies

2017/3 - 2018/7 Subject Matter Expert, Policy/Regulation Development
Group/Organization/Business Serviced: Autorité des marchés financiers (AMF)
Target Stakeholder: Policy Maker/Regulator
Outcome / Deliverable: A mini-course on cryptography and blockchain technology for Quebec's financial market regulators given occasionally over many months (overlapping with our grant from AMF), as well as attending various stakeholders meetings as an expert.
Evidence of Uptake/Impact: Well attended, many questions, some input sought on reports and statements.

- 2017/8 - 2018/4
 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Serviced: Treasury Board of Canada Secretariat
 Target Stakeholder: Policy Maker/Regulator
 Outcome / Deliverable: Policy recommendations report (25+ contributors) and "Blockchain@GC" event.
 Evidence of Uptake/Impact: Report was never finished (to my knowledge) but a knowledge transfer event was successful (which I spoke at; see presentations).
- 2018/3 - 2018/3
 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Serviced: House of Commons: Standing Committee on Finance
 Target Stakeholder: Policy Maker/Regulator
 Outcome / Deliverable: Testimony on blockchain technology for the "Statutory Review of the Proceeds of Crime and Terrorist Financing Act"
 Evidence of Uptake/Impact: Uncertain.
- 2018/2 - 2018/2
 Subject Matter Expert, Business Innovation
 Group/Organization/Business Serviced: Canadian National Railway (CN)
 Target Stakeholder: Industry/Business (>500 employees)
 Outcome / Deliverable: Single consultation on blockchain technologies for transport and supply chain management with firm VPs
 Evidence of Uptake/Impact: Good response. Shortly after, CN joined Blockchain in Transport Alliance (BiTA)
- 2018/1 - 2018/1
 Subject Matter Expert, Consulting for Industry
 Group/Organization/Business Serviced: Investissement Quebec
 Target Stakeholder: Industrial Consortium
 Outcome / Deliverable: Single consultation on cryptocurrency mining operations in Quebec for Investissement Quebec (a company established by the government of Quebec)
 Evidence of Uptake/Impact: Well-attended with many questions. Uncertain uptake.
- 2017/8 - 2017/8
 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Serviced: Minister of Democratic Institutions
 Target Stakeholder: Policy Maker/Regulator
 Outcome / Deliverable: Roundtable consultation with Karina Gould, then Minister of Democratic Institutions (House of Commons, Canada)
 Evidence of Uptake/Impact: Advocated (1) against online voting at the Federal level due to security concerns and (2) developing municipal standards for online voting. Receptive to first (dovetailing CSE report), not to second (jurisdictional issues).
- 2016/7 - 2016/9
 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Serviced: Royal Canadian Mounted Police (RCMP)
 Target Stakeholder: Government Personnel
 Outcome / Deliverable: Participation in roundtable discussions on law enforcement and digital currencies with representatives from many federal government branches.
 Evidence of Uptake/Impact: Confidential
- 2016/3 - 2016/3
 Subject Matter Expert, Consultation Service
 Group/Organization/Business Serviced: National Research Council
 Target Stakeholder: Government Personnel
 Outcome / Deliverable: A mini-course on cybersecurity for project managers and team members

2013/11 - 2015/9	<p>Subject Matter Expert, Consultation Service Group/Organization/Business Serviced: City of Toronto Target Stakeholder: Government Personnel Outcome / Deliverable: A series of audit reports, as well as meetings and discussions. Evidence of Uptake/Impact: The final decision of the city (not to proceed with online voting) referenced the issues we reported. Submissions by the city in an ensuing appeal over whether one of our reports could be released unredacted under a FIPA request argued that the severity of our findings would be harmful if released publicly. References / Citations / Web Sites: Toronto RFP: https://t.co/0kgoDMIXzQ Some documents released under freedom of information: https://t.co/eQX8rq4GRw IPC appeal decision: https://t.co/yyMOdYXnSO Activity Description: Security review of online voting systems provided by three vendors. Deeper analysis for selected system.</p>
2015/5 - 2015/5	<p>Subject Matter Expert, Policy/Regulation Development Group/Organization/Business Serviced: Cour du Québec Target Stakeholder: Government Personnel Outcome / Deliverable: Training for Quebec judges on cybercrime involving digital currencies at the Formation Régionale de la Cour du Québec.</p>
2014/4 - 2014/4	<p>Subject Matter Expert, Policy/Regulation Development Group/Organization/Business Serviced: Senate of Canada: Standing Committee on Banking, Trade and Commerce Target Stakeholder: Policy Maker/Regulator Outcome / Deliverable: Provided testimony on virtual currencies, with an emphasis on Bitcoin, with an oral presentation. Answered questions. Evidence of Uptake/Impact: Extensively cited in ensuing Senate report "Digital Currency: You Can't Flip This Coin!" References / Citations / Web Sites: https://sencanada.ca/content/sen/committee/412/banc/rms/12jun15/home-e.htm</p>

Other Memberships

2018/12 Professional Engineer (P.Eng.), Professional Engineers of Ontario (PEO)

Presentations

1. (2019). Blockchain Technologies: Landscape and Future Directions. CFA Montreal FinTech Rendez-vous, Montreal, Canada
Invited?: Yes, Keynote?: No
2. (2019). Introduction to Blockchain for Non-Profits. Social Innovation: Int'l Development and Blockchain, McGill, Montreal, Canada
Invited?: Yes, Keynote?: No
3. (2019). Blockchain Technologies: Landscape and Future Directions. Blockchain lunch and learn, Canada Mortgage and Housing Corporation (CMHC), Ottawa, Canada
Invited?: Yes, Keynote?: No
4. (2018). Ledgers Past, Present and Future. GC Blockchain Day, Treasury Board Secretariat of Canada, Ottawa, Canada
Invited?: Yes, Keynote?: No

5. (2018). Blockchain Applications & Real-Estate. Panel, BMO 13th Annual Realestate Conference, Chicago, United States of America
Invited?: Yes, Keynote?: No
6. (2018). Blockchain Technologies: Landscape and Future Directions. 14th annual GoSec Cyber Security Conference (GoSec 2018), Montreal, Canada
Invited?: Yes, Keynote?: No
7. (2018). Workplace 2020. Panal, Management Consulting Club, Concordia, Montreal, Canada
Invited?: Yes, Keynote?: No
8. (2018). Blockchain Nuances. The first annual conference on FinTech and Banking Transformation (FinteQC), Levis, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
9. (2018). Blockchain Technologies: Landscape and Future Directions. BMO ThinkSeries, Montreal, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
10. (2018). Blockchain Technologies. Speaker Series, Canada Pension Plan Investment Board (CPPIB), Toronto, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
11. (2018). Blockchain Technologies: Landscape and Future Directions. True North Science Bootcamp, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
12. (2018). Democracy Enhancing Technologies. CryptoFest, Startupfest 2018, Montreal, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No
13. (2018). Liquid Democracy and Blockchains. Defending Democracy: Confronting Cyber-Threats At Home And Abroad, Ottawa, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
14. (2018). Blockchain Technology: Landscape & Future Directions. Montreal Police Pension Fund (ABRPPVM), Montreal, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
15. (2018). Blockchain Technology: National Security Use-Cases. Blockchain and National Security, Public Safety Canada, Ottawa, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
16. (2018). The Future of Money. Panel, The Walrus LIVE, Toronto, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No
17. (2018). Blockchain Nuances: Lessons from Fintech use-cases. Blockchain Technology Symposium (BTS), Fields Institute, Toronto, Canada
Invited?: Yes, Keynote?: No

18. (2018). Blockchain Technologies: Landscape and Future Directions. Anticipating Future Trends and Managing Risks Program, HEC Paris and John Molson Business School, Concordia University, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
19. (2018). Blockchain Technologies: Landscape and Future Directions. RISQ Colloquium, Montreal, Canada
Invited?: Yes, Keynote?: No
20. (2018). Cryptocurrencies: An Investable Asset?. Kenneth Woods Portfolio Management Program, Concordia University, Montreal, Canada
Invited?: Yes, Keynote?: No
21. (2018). Blockchain Technologies: Landscape and Future Directions. TriPAC Pension Advisory Committee Annual Meeting, Toronto, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
22. (2017). Bitcoin & Blockchains: Landscape and Future Directions. Hydro-Québec Symposium 3i, GlobalSIP 2017, Montreal, Canada
Invited?: Yes, Keynote?: No
23. (2017). Zero Knowledge. Blockchain Meetup, District 3, Montreal, Canada
Invited?: Yes, Keynote?: No
24. (2017). Provisions: Privacy-Preserving Proofs of Solvency. Seminar, Newcastle University, Newcastle-upon-Tyne, United Kingdom
Invited?: Yes, Keynote?: No
25. (2017). Blockchains: Smart Contracts and Media-Driven Crypto Currencies. Panel, Canada Music Week, Toronto, Canada
Invited?: Yes, Keynote?: No
26. (2017). Democracy Enhancing Technologies: From Theory to Practice. Speaker Series, Centre for the Study of Democratic Citizenship (CSDC), Montreal, Canada
Invited?: Yes, Keynote?: No
27. (2017). Bitcoin & Blockchains: Landscape and Future Directions. 15th International Conference on Privacy, Security and Trust (PST), Calgary, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
28. (2017). The Bitcoin & Blockchain Technology Landscape. 12th Metropolis World Congress, Montreal, Canada
Invited?: Yes, Keynote?: No
29. (2016). Bitcoin & Blockchains: Landscape and Future Directions. Bank of Canada, Ottawa, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
30. (2016). Blockchain and Voting: Assessment & Critique. Online Voting Roundtable: Electoral Futures in Canada, Ottawa, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
31. (2016). Bitcoin: an impartial assessment of its use and potential for cybercrime. Examining Cybercrime 2: Financial Edition, Anti-phishing working group (APWG), Symposium on Electronic Crime Research, Toronto, Canada
Invited?: Yes, Keynote?: No

32. (2016). Bitcoin & Blockchains: Tutorial. ASIMM Colloque RSI, Montreal, Canada
Invited?: Yes, Keynote?: No
33. (2016). Blockchain nuances.P2P Financial Systems Workshop, London, United Kingdom
Invited?: Yes, Keynote?: Yes
34. (2016). Bitcoin & Blockchains: Part 2. Bank of Canada, Ottawa, Canada
Invited?: Yes, Keynote?: No
35. (2016). Blockchain Technologies and the Future of Finance. C.D. Howe, Toronto, Canada
Invited?: Yes, Keynote?: No
36. (2016). Blockchain-based voting: potential and limitations. MIT Bitcoin Expo, MIT, Cambridge, United States of America
Invited?: Yes, Keynote?: No
37. (2016). The Bitcoin & Blockchain Technology Landscape. Symposium on Foundations & Practice of Security, Laval, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
38. (2016). The Future of Blockchain. Meetup, District 3, Montreal, Canada
Invited?: Yes, Keynote?: No
39. Arvind Narayanan (Princeton University), Matthew Green (Johns Hopkins University) and Peter Todd. (2014). Altcoins. Bitcoin Workshop, Center for Information Technology Policy (CITP), Princeton University, Princeton, United States of America
Invited?: Yes, Keynote?: No

Broadcast Interviews

- | | |
|----------------------------|--|
| 2020/05/26 -
2020/05/26 | Contact tracing, The Aaron Rand Show, CJAD 800 |
| 2017/12/05 -
2017/12/05 | Bitcoin regulation, Business Report, CBC Radio One |

Text Interviews

- | | |
|------------|--|
| 2020/05/25 | Are we ready for an app that trades privacy for more freedom?, Montreal Gazette |
| 2020/05/02 | Chaînes de blocs: dompter la décentralisation de l'informatique, Le Devoir |
| 2019/12/22 | Academic: All Undergrads Should Learn About Bitcoin & Blockchain, Cryptonews |
| 2018/07/13 | Banks Claim They're Building Blockchains. They're Not., Investopedia |
| 2018/03/20 | The evolution of cryptojacking, CryptoInsider |
| 2018/03/16 | The Ethics Of Cryptojacking: Rampant Malware Or Ad-Free Internet?, CoinTelegraph |
| 2018/03/14 | One of the Biggest Coinhive Users Made \$7.69 In 3 Months, Motherboard |
| 2018/03/10 | Attack Or Business Opportunity? Academics Question Ethics Of Coinhive Cryptojacking, CoinTelegraph |
| 2018/01/29 | How much should I regret not buying Bitcoin?, Gizmodo |
| 2017/06/21 | How blockchain-based payment is changing the cannabis industry, IBM thinkLeaders |
| 2017/02/28 | Ottawa explores potential of 'blockchain,' billed as next-generation Internet tech, Toronto Star |

2016/08/30	Block the vote: Could Blockchain Technology Cybersecure Elections?, Forbes
2016/05/02	He's Bitcoin's Creator, He Says, but Skeptics Pounce on His Claim, The New York Times
2016/02/19	Logged out, but still out there, Globe and Mail
2016/02/10	Princeton University releases first draft of bitcoin textbook, CoinDesk
2015/12/27	The top 10 cryptocurrency research papers of 2015, CoinDesk
2015/02/01	Canada's Internet Voting Problem, SC Magazine
2014/10/08	"Latest Internet voting reports show failures across the board", Al Jazeera America
2014/06/16	"How Block Chain Technology Could Usher in Digital Democracy", CoinDesk
2014/05/24	"Can Bitcoin help predict the future?", CoinDesk
2014/04/21	"Heartbleed and sentinels of the net: How a coding flaw called Heartbleed broke the Internet and how a small group of volunteer OpenSSL programmers saved it", The Montreal Gazette
2014/03/28	PROFESSOR: There Is A Big, Gaping Flaw In The New Satoshi Study, Business Insider
2014/02/12	"2014 Federal Budget Calls Bitcoin A Terrorist, Crime 'Risk'", The Huffington Post
2014/02/06	"Bitcoin: How its core technology will change the world", The New Scientist
2014/02/04	"Montreal's Bitcoin Embassy bridges gap between digital currency and real world", Montreal Gazette, Front Page of Business Section
2014/01/14	"More than money, bitcoin's real value lies in its algorithms", InfoWorld

Publications

Journal Articles

1. Erica Pimentel, Emilio Boulianne, Shayan Eskandari*, Jeremy Clark. (2021). Systemizing the Challenges of Auditing Blockchain-Based Assets. *Journal of Information Systems*.
Published
Refereed?: Yes, Open Access?: No
2. G. Dagher*, B. Fung, N. Mohammad, J. Clark. (2020). SecDM: Privacy-preserving Data Outsourcing Framework with Differential Privacy. *Knowledge and Information Systems (Springer)*. 62: 1923–1960.
Published
Refereed?: Yes
3. S. Ruoti, B. Kaiser, A. Yerukhimovich, J. Clark, R. Cunningham. (2020). Blockchain Technology: What is it good for?. *Communications of the ACM*. 63(1): 46-53.
Published
Refereed?: No, Open Access?: Yes
4. J. Clark, D. Demirag*, S. Moosavi*. (2020). Demystifying Stablecoins. *Communications of the ACM*. 63(7): 40-46.
Published
Refereed?: No, Open Access?: Yes
5. A. Narayanan, J. Clark. (2017). Bitcoin's Academic Pedigree. *Communications of the ACM*. 60(12): 36-45.
Published
Refereed?: Yes, Open Access?: Yes

6. Ester Moher, Jeremy Clark, Aleksander Essex,. (2014). Diffusion of voter responsibility: potential failings in E2E receipt checking. *USENIX Journal of Election Technology and Systems*. 3(1): 1-17.
Published
Refereed?: Yes, Open Access?: Yes
7. Jeremy Clark. (2014). Enhancing Anonymity: Cryptographic and statistical approaches for shredding our digital dossiers. *ACM Computing Reviews*.
Published
Refereed?: No, Open Access?: Yes

Book Chapters

1. R. Carback, D. Chaum, J. Clark, J. Conway, A. Essex, P. S. Herrnson, T. Mayberry, S. Popoveniuc, R. L. Rivest, E. Shen, A. T. Sherman, P. L. Vora. (2016). The Scantegrity Voting System and its Use in the Takoma Park Elections. *Real-World Electronic Voting: Design, Analysis and Deployment*. : Chapter 10.
Published, CRC Press
Refereed?: Yes
2. Foreword: J. Clark // Book: A. Narayanan, J. Bonneau, E. Felten, A. Miller, S. Goldfeder. (2016). Foreword: The Long Road to Bitcoin. *Bitcoin and Cryptocurrency Technologies*. : iv-xxvii.
Published, Princeton University Press
Refereed?: No

Conference Publications

1. E. Mangipudi, K. Rao, J. Clark, A. Kate. (2019). Automated Penalization of Data Leakage using Crypto-augmented Smart Contracts. *IEEE Workshop on Security & Blockchains (IEEE S&B)*,
Paper
Published
Refereed?: Yes, Invited?: No
2. S. Eskandari*, M. Moosavi*, J. Clark. (2019). Transparent Dishonesty: front-running attacks on Blockchain. *Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 11599*. Trusted Smart Contracts,
Paper
Published
Refereed?: Yes, Invited?: No
3. M. Elsheikh, J. Clark, A. Youssef. (2019). Deploying PayWord on Ethereum. *Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 11599*. Trusted Smart Contracts,
Paper
Published
Refereed?: Yes, Invited?: No
4. V. Zhao, J. Choi, D. Demirag*, M. Mannan, K. Butler, E. Ayday, J. Clark. (2019). One-time programs made practical. *LNCS 11598*. *Financial Cryptography and Data Security (FC)*,
Paper
Published
Refereed?: Yes, Invited?: No
5. M Rahimian*, S Eskandari*, J. Clark. (2019). Resolving the Multiple Withdrawal Attack in ERC20 Tokens. *IEEE Workshop on Security & Blockchains (IEEE S&B)*,
Paper
Published
Refereed?: Yes, Invited?: No

6. C. Okoye*, J. Clark. (2018). Toward Cryptocurrency Lending. Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 10958. Trusted Smart Contracts, Paper
Published
Refereed?: Yes, Invited?: No
7. S. Eskandari*, A. Leoutsarakosg*, T. Mursch, J. Clark. (2018). A first look a browser-based cryptojacking. IEEE Workshop on Security & Blockchains (IEEE S&B), Paper
Published
Refereed?: Yes, Invited?: No
8. M. Moosavi*, J. Clark. (2018). Ghazal: toward truly authoritative web certificates using Ethereum. Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 10958. Trusted Smart Contracts, Paper
Published
Refereed?: Yes, Invited?: No
9. S. Eskandari*, J. Clark, M. Adham, V. Sundaresan. (2017). On the feasibility of decentralized derivatives markets. Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 10323. Trusted Smart Contracts, Paper
Published
Refereed?: Yes, Invited?: No
10. N. Yang* and J. Clark. (2017). Practical Governmental Voting with Unconditional Integrity and Privacy. Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 10323. Secure Voting Systems (VOTING), Paper
Published
Refereed?: Yes, Invited?: No
11. G. Dagher*, B. Bünz, J. Bonneau, J. Clark, D. Boneh. (2015). Provisions: Privacy-preserving proofs of solvency for Bitcoin exchanges. ACM Conference on Computer and Communications Security (CCS), Paper
Published
Refereed?: Yes, Invited?: No
12. Joseph Bonneau, Andrew Miller, Jeremy Clark, Arvind Narayanan, Joshua Kroll, and Edward W. Felten. (2015). Bitcoin and Second-generation Cryptocurrencies. IEEE Symposium on Security and Privacy, San Jose, United States of America
Conference Date: 2015/5
Paper
Published
Refereed?: Yes, Invited?: No
13. Shayan Eskandari, David Barrera, Elizabeth Stobert, and Jeremy Clark. (2015). A First Look at the Usability of Bitcoin Key Management. NDSS Workshop on Usable Security 2015, San Diego, Conference Date: 2015/2
Paper
Published
Refereed?: Yes, Invited?: No

14. Barrera D, McCarney D, Clark J, van Oorschot P. (2014). Baton: Future-proofing Android's Decentralized Code Signing Infrastructure. ACM Conference on Security and Privacy in Wireless and Mobile Networks, Oxford, United Kingdom
Conference Date: 2014/7
Paper
Published
Refereed?: Yes, Invited?: No
15. J. Bonneau, J. Clark, E.W. Felten, J.A. Kroll, A. Miller, A. Narayanan. (2014). On Decentralizing Prediction Markets and Order Books. Workshop on the Economics of Information Security (WEIS), State College, United States of America
Conference Date: 2014/6
Paper
Published
Refereed?: Yes, Invited?: No
16. Backes M, Clark J, Druschel P, Kate A, Simeonovski M. (2014). BackRef: Accountability in Anonymous Communication Networks. Springer LNCS 8479. Applied Cryptography and Network Security, Lausanne, Switzerland (380-400)
Conference Date: 2014/6
Paper
Published
Refereed?: Yes, Invited?: No
17. J. Bonneau, A. Narayanan, A. Miller, J. Clark, J.A. Kroll, E.W. Felten. (2014). Mixcoin: Anonymity for Bitcoin with Accountable Mixes. Springer LNCS 8437. Financial Cryptography and Data Security (FC), Barbados, Barbados (486-504)
Conference Date: 2014/3
Paper
Published
Refereed?: Yes, Invited?: No

**Curriculum Vitae
Dssouli Rachida**

Name: Dssouli Rachida,
Citizen: Canadian

Rank/ Title: Full Professor

Department/ Faculty: Concordia Institute for Information Systems Engineering (CIISE), Faculty of Engineering and Computer Science,

Institution: Concordia University

Address (W): Rachida Dssouli, Professor

Office EV: 7. 627

Concordia Institute for Information Systems Engineering (CIISE)

Faculty of Engineering and Computer Science

Concordia University

Montreal, PQ, Canada H3G 1M8

Tel. (W): 1(514) 516-24242 ex. 4162

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<http://www.ciise.concordia.ca/~dssouli>

1. RESEARCH INTERESTS

Software Engineering, Communication Software Engineering, Communication Protocols and Networks, Software Quality Assurance, Service Engineering/ Computing, Conformance Testing based on Models and Timed automata, Requirement Engineering based on Scenarios, Multimedia Applications and QoS, Security Testing. Industry 4.0.

2. RESEARCH CONTRACTS & GRANTS RECEIVED

RESEARCH SUPPORT			
Family name and initial(s) of applicant	Title of proposal, funding source and program, and time commitment (hours/month)	Amount per year	Years of tenure (yyyy)
a) Support held NSERC Discovery Rachida Dssouli		20,000 (100%)	2011-2016
b) Support held Rachida Dssouli Jamal Bentahar Ghizlaine El Bousaidi Liam Peyton (PI)	AVIO-605 TEST Automation with TTCN-3 CRIAQ/ MITACS/CMC/SILKAN	240,745.00 (50%)	2014-2017
c) Support held Rachida Dssouli (PI) Jamal Bentahar (CIISE) Ghizlaine El Bousaidi (ETS) Ferhat Khendek (ECE)	AVIO-604 Specification and Verification of Design Models for Certifiable Avionics Software CRD NSERC*/ CRIAQ/ CMC/ CS Canada	59,000 (30%)* 60,000 (30%)* 60,000 (30%)* 52,500 (30%) 52,000 (30%) 52,000 (30%)	2015-2016 2016-2017 2017-2018 2015-2016 2016-2017 2017-2018
d) Support currently held NSERC Discovery Grant	Service Composition Testing and Verification	140,000 (100%)	2018-2023- 2024

3. RESEARCH CONTRIBUTIONS

3.1. BOOKS (Eds)

1. F. Belqasmi, H. Harroud, M. Agueh, **R. Dssouli**, F. Kamoun (Eds.), Emerging Technologies for Developing Countries, First International EAI Conference, AFRICATEK 2017, Marrakech, Morocco, March 27-28, Proceedings 2017, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Springer, vol. 206, 2018

3.2. REFEREED JOURNAL PUBLICATIONS

2. [Abdeladim Sadiki](#), [Jamal Bentahar](#)^{ORCID}, Rachida Dssouli, [Abdeslam En-Nouaary](#), [Hadi Otrok](#): **Deep reinforcement learning for the computation offloading in MIMO-based Edge Computing**. *Ad Hoc Networks* 141: 103080 (2023)
3. [Ikbale Taleb](#)^{ORCID}, [Mohamed Adel Serhani](#)^{ORCID}, [Chafik Bouhaddioui](#)^{ORCID}, Rachida Dssouli: **Big data quality framework: a holistic approach to continuous quality management**. *J. Big Data* 8(1): 76 (2021)
4. Mounia Elqortobi, Warda El-Khouly, Amine Rahj, Jamal Bentahar, Rachida Dssouli: Verification and testing of safety-critical airborne systems: A model-based methodology. *Comput. Sci. Inf. Syst.* 17(1): 271-292 (2020)
5. Warda El Kholly, Mohamed El-Menshawy, Jamal Bentahar, Mounia Elqortobi, Amine Laarej, Rachida Dssouli: Model checking intelligent avionics systems for test cases generation using multi-agent systems. *Expert Syst. Appl.* 156: 113458 (2020)
6. Hadeel T. El Kassabi, Mohamed Adel Serhani, Rachida Dssouli, Alramzana Nujum Navaz: Trust enforcement through self-adapting cloud workflow orchestration. *Future Generation Comp. Syst.* 97: 462-481 (2019)
7. Nader Kesserwan, Rachida Dssouli, Jamal Bentahar, Bernard Stepien, Pierre Labrèche, “From use case maps to executable test procedures: a scenario-based approach”, *Software and System Modeling* 18(2): 1543-1570 (2019)
8. H. T. El Kassabi, M. Adel Serhani, **R. Dssouli**, B. Benatallah, “A Multi-Dimensional Trust Model for Processing Big Data Over Competing Clouds”. *IEEE Access* 6: 39989-40007, 2018
9. **R. Dssouli**, A. Khoumsi, M. Elqortobi, J. Bentahar, Chapter Three - Testing the Control-Flow, Data-Flow, and Time Aspects of Communication Systems: A Survey. *Advances in Computers* 106: 95-155, 2017
10. A. S. Bataineh*, J. Bentahar, M. El-Menshawy, **R. Dssouli**, “Specifying and verifying contract-driven service compositions using commitments and model checking”. *Expert Syst. Appl.* 74: 151-184, 2017
11. W. El Kholly, J. Bentahar, M. El-Menshawy, H. Qu, **R. Dssouli**, “SMC4AC: A New Symbolic Model Checker for Intelligent Agent Communication”. *Fundam. Inform.* 152(3): 223-271, 2017
12. S. Bataineh*, J. Bentahar, M. El-Menshawy, **R. Dssouli**, “Specifying and verifying contract-driven service compositions using commitments and model checking”, *Expert Syst. Appl.* 74: 151-184, 2017
13. O. Mare*y, J. Bentahar, E. Khosrowshahi Asl, K. Sultan, **R. Dssouli**, “Decision making under subjective uncertainty in argumentation-based agent negotiation”, *J. Ambient Intelligence and Humanized Computing* 6(3): 307-323, 2015

14. M. El-Menshawy, J. Bentahar, W. El Kholy*, P. Yolum, **R. Dssouli**, “Computational logics and verification techniques of multi-agent commitments: survey”, *Knowledge Eng. Review* 30(5): 564-606 (2015) (5 Year Impact Factor 1.052)
15. S. Rabah*, M. El Barachi, N. Kara, **R. Dssouli**, J. Paquet: A Service Oriented Broker-Based Approach for Dynamic Resource Discovery in Virtual Networks, Accepted in *Journal of Cloud Computing*, SpringerOpen Journal 4:3, 2015
<http://www.journalofcloudcomputing.com/content/4/1/3>
16. W. El Kholy*, M. El-Menshawy, J. Bentahar, H. Qu, **R. Dssouli**, “Formal Specification and Automatic Verification of Conditional Commitments”, *IEEE Intelligent Systems* 30(2): 36-44 (2015) (5-Year Impact factor 2.344)
17. W. El Kholy*, Jamal Bentahar, M. El Menshawy, H. Qu, and **R. Dssouli**, “Conditional Commitments: Reasoning and Model Checking”, *ACM Trans. Softw. Eng. Methodol.* 24(2): 9:1-9:49 (2014), (Top 1 Journal in Software Engineering, 5-Year Impact Factor 1.694)
18. O. Marey*, J. Bentahar, **R. Dssouli**, M. Mbarki, “Measuring and analyzing agents' uncertainty in argumentation-based negotiation dialogue games”, *Expert Syst. Appl.* 41(2): 306-320 (2014)
19. W. El Kholy*, J. Bentahar, M. El-Menshawy, H. Qu, **R. Dssouli**, “Modeling and verifying choreographed multi-agent-based web service compositions regulated by commitment protocols”, *Expert Syst. Appl.* 41(16): 7478-7494, 2014

Book Chapters

20. **R. Dssouli**, A. Khoumsi, M. Elqortobi, J. Bentahar: Chapter Three - Testing the Control-Flow, Data-Flow, and Time Aspects of Communication Systems: A Survey. *Advances in Computers* 106: 95-155, 2017

5.6. OTHER REFEREED PUBLICATIONS

1. Mounia Elqortobi, Amine Rahj, Jamal Bentahar, Rachida Dssouli: Test Generation Tool for Modified Condition/Decision Coverage: Model Based Testing. *SITA* 2020: 38:1-38:6
2. Ikbale Taleb, Mohamed Adel Serhani, Rachida Dssouli: Big Data Quality: A Data Quality Profiling Model. *SERVICES* 2019: 61-77, 2019
3. H. T. El Kassabi*, M. Adel Serhani, R. Dssouli, N. Al-Qirim, I. Taleb*, “Cloud Workflow Resource Shortage Prediction and Fulfillment Using Multiple Adaptation Strategies”. [IEEE CLOUD 2018](#): 974-977, 2018
4. I. Taleb*, M. Adel Serhani, R. Dssouli, “Big Data Quality: A Survey”. [BigData Congress 2018](#): 166-173, 2018
5. M. Elqortobi*, W. El-Khouly, A. Rahj*, J. Bentahar, R. Dssouli, “Model-Based Verification and Testing Methodology for Safety-Critical Airborne Systems”. [MEDI Workshops 2018](#): 63-74, 2018
6. H. El-Kassabi, M. A. Serhani, C. Bouhaddioui, R. Dssouli, “Trust Assessment-Based Multiple Linear Regression for Processing Big Data over Diverse *Clouds*”, *AFRICATEK 2017*, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Springer, vol. 206, 2018

7. N. Kesserwan*, R. Dssouli, J. Bentahar “Modernization of legacy software tests to model-driven testing”, AFRICATEK 2017, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Springer, vol. 206, 2018
8. M. Elqortobi*, J. Bentahar, R. Dssouli, “Framework for Dynamic Web Services Composition Guided by Live Testing”, AFRICATEK 2017, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Springer, vol. 206, 2018
9. H. T. El Kassabi*, I. Taleb*, M. A. Serhani, R. Dssouli: Policy-Based QoS Enforcement for Adaptive Big Data Distribution on the Cloud. *BigDataService 2016*: 225-233, 2016
10. S. Rabah*, F. Belqasmi, R. Mizouni, R. Dssouli, “An Elastic Hybrid Sensing Platform: Architecture and Research Challenges”, *FNC/MobiSPC 2016*: 113-120, 2016
11. I. Taleb*, H. T. El Kassabi*, M. A. Serhani, Rachida Dssouli, C. Bouhaddioui, “Big Data Quality: A Quality Dimensions Evaluation”, *UIC/ATC/ScalCom/CBDCCom/IoP/SmartWorld 2016*: 759-765, 2016
12. W. El Kholy*, M. El-Menshawy, A. Laarej*, J. Bentahar, F. Al-Saqqar, R. Dssouli, “Real-Time Conditional Commitment Logic”, *PRIMA 2015*: 547-556, 2015
13. M. Aly*, M. El Barachi, R. Dssouli, “A new information model towards context-aware service provisioning in the Internet-of-Things”, *ICIN 2015*: 160-167, 2015
14. I. Taleb*, R. Dssouli, M. Adel Serhani, “Big Data Pre-Processing: A Quality Framework” *BigData2015, IEEE 2015 CLOUD/ICWS/BigDataCongress/SCC/MS/SERVICES*, 2015: 191-198, 2015
15. S. Behrouznia*, R. Dssouli, M. El Barachi, “A QoS based Resource Selection Approach for Virtual Networks”, published/ presented in *International Conference on Computer and Information Science and Technology 2015*, in Avestia Publishing (Open Access) University of Ottawa, Ottawa, Canada on May 11–12, 2015
16. O. Marey*, J. Bentahar, E. Khosrowshahi Asl*, M. Mbarki, R. Dssouli, “Agents' Uncertainty in Argumentation-based Negotiation: Classification and Implementation”, *ANT/SEIT 2014*: 61-68, 2014
17. W. El Kholy*, M. El Menshawy, J. Bentahar, H. Qu, and R. Dssouli, “Verifying Multiagent-based Web Service Compositions Regulated by Commitment Protocols”. In *Proceedings of the IEEE International Conference on Web Services (IEEE ICWS)*, pp. 49-56, June 27-July 2, 2014, Alaska, USA. [Acceptance rate =20%, Top Conference in Web Services]. The paper has been awarded "Best Paper". 2014
18. W. El Kholy*, M. El-Menshawy*, J. Bentahar, H. Qu, R. Dssouli, “Representing and reasoning about communicative conditional commitments”, *AAMAS 2013*: 1169-1170, 2013

4. STUDENT SUPERVISION

4.1. Ph.D. thesis completed under my supervision/co-supervision (16 graduated)

	Name	Thesis and year of graduation	Current position
1.	Nader Kesserwan	Automated Testing: Requirements Propagation via Model Transformation in Embedded Software 2020	Assistant Faculty member in USA
2.	Taleb Ikbal Dr. Serhani	Big Data Quality Management Framework, June 2019	Sharja University UAE 2019
3.	Hadeel El Kassabi Dr. Serhani	End-to-End Trust Fulfillment of Big Data Workflow Provisioning over competing clouds, November 2018	UAEU, November 2018
4.	Al-Hussaeni Khalil B. Fung	Preserving Privacy in High-Dimensional Data Publishing Concordia University	April 2017
5.	El Kholy Warda J. Bentahar	Formal Specification and Automatic Verification of Multi-Agent Conditional Commitments and their Applications, Concordia University	Assistant Professor in Egypt 2016
6.	Marey Ibrahim Omar J. Bentahar	A Framework for Argumentation-Based Agent Negotiation in Uncertain Settings Concordia University	Assistant Faculty member, Saudi Arabia 2016/ January



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Dr. Carol Fung

Correspondence language: English

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Dr. Carol Fung

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes

Degrees

Master's Thesis, Computer Science, The University of Manitoba

Doctorate, Computer Science, University of Waterloo

Bachelor's, Computer Science, The University of Manitoba

User Profile

Research Specialization Keywords: Cybersecurity, DDoS Detection and Mitigation, Network management

Employment

2022/1	Gina Cody Research Chair in Cybersecurity and the Internet of Things CIISE, Concordia University Full-time, Associate Professor Tenure Status: Tenure
2019/6 - 2021/12	Associate professor Computer Science, Virginia Commonwealth University Full-time, Associate Professor Tenure Status: Tenure
2013/8 - 2019/5	Assistant professor Computer Science, Virginia Commonwealth University Full-time Tenure Status: Tenure Track
2012/5 - 2013/4	Research Intern Blackberry Ltd
2010/5 - 2010/8	Software Engineer intern Google Ltd

Research Funding History

Awarded [n=2]

2022/1 - 2026/12 Security and Privacy Protection Framework for IoT networks, Research Chair
Principal Investigator

Funding Sources:

Gina Cody Foundation
 Total Funding - 500,000
 Portion of Funding Received - 500,000
 Funding Competitive?: Yes

2022/1 - 2023/12
 Principal Applicant

Concordia University Startup Grant, Grant

Funding Sources:

Concordia University
 Total Funding - 50,000
 Portion of Funding Received - 50,000
 Funding Competitive?: No

Completed [n=4]

2021/8 - 2022/7
 Co-investigator

Enhancing the Privacy and Reliability of Massive-scale Bluetooth Low Energy Contact Tracing, Grant

Funding Sources:

Commonwealth Cyber Initiative
 CCI
 Total Funding - 250,000
 Portion of Funding Received - 50,000
 Funding Competitive?: Yes

2020/8 - 2021/7
 Co-investigator

User-Centric Privacy Controls for Smart Home Devices, Grant

Funding Sources:

Commonwealth Cyber Initiative
 Total Funding - 136,489
 Portion of Funding Received - 60,000
 Funding Competitive?: Yes

2019/8 - 2020/7
 Co-investigator

Human-Centric Privacy-Preserving Controls for Smart Home Devices, Grant

Funding Sources:

4-VA
 4-VA
 Total Funding - 30,000
 Portion of Funding Received - 5,000
 Funding Competitive?: Yes

2016/8 - 2017/7
 Principal Applicant

Application Security through Crowdsourcing, Grant

Funding Sources:

VCU Commercial Quest Fund
 VCU Commercial Quest Fund
 Total Funding - 26,000
 Portion of Funding Received - 26,000
 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=2]

- 2017/8 - 2019/7 Pulkit Rustigi, Virginia Commonwealth University
Principal Supervisor Thesis/Project Title: THE EVALUATION OF AN ANDROID PERMISSION MANAGEMENT SYSTEM BASED ON CROWDSOURCING
Present Position: Software engineer, Urban Company
- 2013/8 - 2016/1 Ionna Bara, Virginia Commonwealth University
Principal Supervisor Thesis/Project Title: Discovering Spam on Twitter
Present Position: Software engineer, AMD

Doctorate [n=4]

- 2022/9 - 2027/8 Rambod Pakrooh (In Progress) , Concordia University
Principal Supervisor Thesis/Project Title: TBD
Present Position: Research Assistant
- 2022/6 - 2027/5 Y A Joarder (In Progress) , Concordia University
Principal Supervisor Thesis/Project Title: TBD
Present Position: Research assistant
- 2015/8 - 2018/4 , Virginia Commonwealth University
Principal Supervisor Thesis/Project Title: Transferred to a different adviser to finish the program
Present Position: Instructor, Virginia Commonwealth University
- 2014/8 - 2018/8 , Virginia Commonwealth University
Principal Supervisor Thesis/Project Title: SMARTPHONE USER PRIVACY PRESERVING THROUGH CROWDSOURCING
Present Position: Research director at Comcast, Comcast



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Date Submitted: 2024-03-05 12:10:42

Confirmation Number: 1756209

Template: NSERC_Researcher

Dr. Mohsen Ghafouri

Correspondence language: English

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Work (*)	Mohsen.Ghafouri@concordia.ca



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Dr. Mohsen Ghafouri

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	No	No	Yes	Yes
Persian	Yes	Yes	Yes	Yes	Yes

Degrees

- 2018/6 Doctorate, Electrical engineering, École Polytechnique de Montréal
Supervisors: Mahseredjian, Jean, 2014/1 - 2018/6; Karaagac, Ulas, 2014/1 - 2018/6;
Karimi, Houshang, 2014/1 - 2018/6
- 2011/7 Master's non-Thesis, Electrical engineering - Power systems, Sharif University of
Technology
Supervisors: Vakilian, Mehdi, 2009/9 - 2011/7
- 2009/9 Bachelor's, Electrical Engineering Power, Sharif University of Technology
Supervisors: Vakilian, Mehdi, 2005/9 - 2009/9

Recognitions

- 2024/3 - 2026/3 Gina Cody Research and Innovation Fellowship - 40,000
Concordia University
Prize / Award
The 40,000 CAD internal award in the area of innovation
- 2021/10 Best Paper Award
IEEE
Honor
Our paper in GUCON 2021 was selected as the best paper and got the best paper award
of the conference. It was also invited to IEEE Transactions on Industry Applications
- 2018/9 - 2019/9 Horizon postdoctoral fellowship - 48,000
Concordia University
Prize / Award
The grant was awarded by Concordia University to a set of postdoctoral applicants in
various engineering themes.

User Profile

Research Specialization Keywords: Cyber security analysis of smart grids, Renewable energies, Wind farm modeling and control, Power system modeling, Stability analysis and control of systems

Employment

- 2019/9
 Assistant Professor
 Concordia Institute for Information Systems Engineering, Engineering and Computer science, Concordia University
 Full-time, Assistant Professor
 Tenure Status: Tenure Track
 - Conducting research on the cyber security of smart grid systems - Supervising graduate and undergraduate students - Presenting graduate and undergraduate courses for Concordia Institution for Information Systems Engineering and Electrical and Computer Engineering departments - Providing community services in university and in academic societies, e.g., reviewing papers, participating in defense session of graduate students, journal editorial boards, etc. - Writing grant applications to provide financial support for students and their research
- 2018/9 - 2019/8
 Postdoc researcher
 Concordia Institute for Information Systems Engineering, Engineering and Computer science, Concordia University
 Full-time
 Tenure Status: Non Tenure Track
 - Providing help on supervising graduate students - Conducting research on various topics including the projects of NSERC/Hydro-Québec Thales Senior Industrial Research Chair in Smart Grid Security and working on self-motivated research subjects - Working on industrial projects that includes the chair projects - Publishing in the journals and conferences, particularly IEEE Transactions - Managing internal meetings with group members and presentations for industrial partners - Assisting on development of co-simulation testbed
- 2018/1 - 2018/8
 Researcher, intern
 Research and development, CYME international, Eaton power solutions
 - Development of algorithms for power system problems - Constructing theoretic foundations for the development of power system models and software packages - Working on modeling of distribution power systems and microgrid - Producing reports for placement and sizing algorithms of batteries and energy storage systems in distribution systems
- 2014/9 - 2014/12
 Teaching assistant
 Electrical engineering, Engineering and Computer science, École Polytechnique de Montréal
 Part-time, Sessional
 Tenure Status: Non Tenure Track
 - Helping course instructor to prepare the required materials for the course - Preparing Lab and computer-based assignments, tutorials, and sessions - Developing the project of the course and its evaluation
- 2012/6 - 2014/1
 Researcher
 Power system and reliability studies, NRI, Power system research institute
 - Working on the development of power system simulation software (SABA) - Working on the reliability studies and fault diagnosis of transformers on distribution and transmission systems - Reliability analysis of the distribution and transmission systems of parts of Iranian power system

Research Funding History

Awarded [n=15]

- 2022/5 - 2027/4
 Secure and resilient integration of wind energy in smart grids, Grant

Principal Applicant	<p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 142,000 Portion of Funding Received - 142,000 Funding Competitive?: Yes</p>
2021/10 - 2026/10 Co-applicant	<p>Security of Defence Products of Rheinmetall company: Evaluations and Countermeasures, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) MITACS accelerate Total Funding - 840,000 Portion of Funding Received - 210,000 Funding Competitive?: No</p> <p>Co-applicant : Cuppens, Frédéric; Cuppens-Boullahia, Nora; Majumdar, Suryadipta</p>
2024/3 - 2026/3 Principal Applicant	<p>Gina Cody Research Fellowship, Fellowship</p> <p>Funding Sources: Concordia University Gina Cody Research Fellowship Total Funding - 40,000 Portion of Funding Received - 40,000 Funding Competitive?: Yes</p>
2024/1 - 2026/1 Co-applicant	<p>Global Centers Track 2: Equitable and User-Centric Energy Market for Resilient Grid-interactive Communities, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Global Centers Track 2 Total Funding - 200,000 Portion of Funding Received - 100,000 Funding Competitive?: Yes</p> <p>Principal Applicant : Yan, Jun</p>
2021/1 - 2025/1 Co-applicant	<p>Toward Intelligent and Resilient Smart Cities with Energy-Vehicle-Human Interactions, Grant</p> <p>Funding Sources: Canada Foundation for Innovation (CFI) Purchasing equipment for research Total Funding - 1,808,543 Portion of Funding Received - 180,854 Funding Competitive?: Yes</p> <p>Co-applicant : Clark, Jeremy; Debbabi, Mourad; Lucia, Walter; Mannan, Mohammad; Mohammadi, Arash; Wang, Lingyu; Yan, Jun; Youssef, Amr;</p> <p>Principal Applicant : Assi, Chadi</p>
2021/11 - 2024/11 Co-applicant	<p>Large-Scale Integration of EVs Into the Smart Grid: A Comprehensive Cyber-Physical Study and Security Assessment, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Alliance Total Funding - 234,000</p>

Portion of Funding Received - 78,000
Funding Competitive?: No

Co-applicant : Debbabi, Mourad;
Principal Applicant : Assi, Chadi

2021/10 - 2024/10
Co-applicant

Safe Protective Relaying in Modern Transmission Systems with Massive Power
Electronic-Based Devices, Grant

Funding Sources:

Hong Kong Polytechnic University
General Research Fund for 2021/22
Total Funding - 180,000
Portion of Funding Received - 60,000
Funding Competitive?: Yes

Co-applicant : Kocar, Ilhan;
Principal Applicant : Karagaac, Ulas

2021/9 - 2024/9
Co-applicant

Security and Resiliency of Wide Area Monitoring, Protection, and Control (WAMPAC)
Systems in Smart Grids: Obstacles and Remedies, Grant

Funding Sources:

Public Safety Canada
Cyber Security Cooperation Program
Total Funding - 90,000
Portion of Funding Received - 45,000
Funding Competitive?: Yes

Principal Applicant : Ameli, Amir

2021/4 - 2023/4
Principal Applicant

Cyber Security Analysis of Wind Energy, A Subsynchronous Point of View, Grant

Funding Sources:

Fonds de recherche du Québec - Nature et technologies (FRQNT)
Établissement de la relève professorale
Total Funding - 40,000
Portion of Funding Received - 40,000
Funding Competitive?: Yes

2020/4 - 2023/4
Co-investigator

Subsynchronous Interaction Problems in Power Systems with High Penetration of Power
Electronics-Based Devices, Grant

Funding Sources:

Hong Kong Polytechnic University
General Research Fund for 2020/21
Total Funding - 1,130,000
Portion of Funding Received - 0
Funding Competitive?: Yes

Co-applicant : Kocar, Ilhan;
Principal Applicant : Karaagac, Ulas

2021/4 - 2023/4
Principal Applicant

Cyber Security Analysis of Wind Energy, A Subsynchronous Point of View: Equipment
purchase, Grant

Funding Sources:

Fonds de recherche du Québec - Nature et technologies (FRQNT)
Établissement de la relève professorale
Total Funding - 49,966
Portion of Funding Received - 49,966

2021/4 - 2023/4 Principal Applicant	<p>Funding Competitive?: Yes</p> <p>Protecting Systems of Smart Grids, Cyber Security Challenges and Opportunities, Grant</p> <p>Funding Sources: Concordia University Individual Seed Program Total Funding - 7,000 Portion of Funding Received - 7,000 Funding Competitive?: Yes</p>
2021/4 - 2023/4 Co-investigator	<p>Establishing a Cyber- Security Cluster in the City of Orillia: Analyzing, Feasibility, and Risks, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Alliance Total Funding - 50,000 Portion of Funding Received - 0 Funding Competitive?: No</p> <p>Principal Applicant : Ameli, Amir</p>
2019/9 - 2022/4 Principal Applicant	<p>Security Analysis of Renewable Energies, Grant</p> <p>Funding Sources: Concordia University Startup funds Total Funding - 50,000 Portion of Funding Received - 50,000 Funding Competitive?: No</p>
2018/9 - 2019/9 Principal Applicant	<p>Security Analysis of Microgrids, Scholarship</p> <p>Funding Sources: Concordia University Horizon Postdoctoral fellow Total Funding - 48,000 Portion of Funding Received - 48,000 Funding Competitive?: Yes</p>
Under Review [n=2]	
2024/4 - 2027/4 Co-applicant	<p>Microgrids and Their Crucial Role in Renewable Energy Integration and Cyberdefense, Grant</p> <p>Funding Sources: Fonds de recherche du Québec - Nature et technologies (FRQNT) Team grant Total Funding - 150,000 Portion of Funding Received - 150,000 Funding Competitive?: Yes</p> <p>Principal Applicant : Assi, Chadi</p>
2024/4 - 2025/4 Co-applicant	<p>Developing security metrics for EV ecosystems, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Total Funding - 45,000 Portion of Funding Received - 22,500 Funding Competitive?: Yes</p>

Principal Applicant : Assi, Chadi

Student/Postdoctoral Supervision

Master's Thesis [n=7]

2024/4 - 2026/4 Principal Supervisor	Sebtahmadi, Sina, Concordia University Thesis/Project Title: Security analysis of AC microgrids Present Position: Will start in April 2024
2023/4 - 2025/4 Principal Supervisor	Zeinab Oladi (In Progress) , Concordia University Thesis/Project Title: The security analysis of renewable energy sources Present Position: Started in April 2023
2023/1 - 2025/1 Principal Supervisor	Mirzahoseini, Mehri (In Progress) , Concordia University Thesis/Project Title: Resilient-control of wind energy systems Present Position: started in January 2023
2023/1 - 2025/1 Principal Supervisor	Mohammad pasha shabanfar (In Progress) , Concordia University Student Degree Expected Date: 2023/1 Thesis/Project Title: Security analysis of advanced metering infrastructure Present Position: starting on Jan 2023
2022/9 - 2024/9 Principal Supervisor	Babazadeh-Dizaji, Ramin (In Progress) , Concordia University Thesis/Project Title: Security analysis of microgrids Present Position: Started in Sep 2022
2021/1 - 2023/1 Principal Supervisor	Ahmadzadeh, Masoud (Completed) , Concordia University Thesis/Project Title: Anomaly detection in smart homes in the presence of distributed energy resources and electric vehicles Present Position: graduated
2020/11 - 2022/11 Co-Supervisor	Liao, Pengyi (Completed) , Concordia University Electrical and computer engineering department Thesis/Project Title: Designing platforms for cyber security analysis of distribution systems Present Position: graduated

Doctorate [n=9]

2024/4 - 2028/4 Principal Supervisor	Jiawei Dong, Concordia University Thesis/Project Title: Vulnerability analysis of EV ecosystem Present Position: Will start in April 2024
2024/1 - 2028/1 Principal Supervisor	Marandi, Saba, Concordia University Thesis/Project Title: The use of blockchain and quantum computing in security enhancement of EV ecosystem Present Position: started in January 2024
2023/9 - 2027/9 Principal Supervisor	Haghjoo, Yasaman (In Progress) , Concordia University Thesis/Project Title: Security analysis of energy storage systems Present Position: will join the group in Sep 2023
2022/9 - 2026/9 Principal Supervisor	Soleymani, Mohammad Mahdi (In Progress) , Concordia University Thesis/Project Title: Security assessment of smart grids with high penetration level of electric vehicles Present Position: Started on Sept. 2022

2022/4 - 2026/4 Principal Supervisor	Babaie Vavdareh, Masoud (In Progress) , Concordia University Thesis/Project Title: Security analysis of FACTS devices in transmission power systems Present Position: Started on Sept. 2022
2022/1 - 2026/1 Principal Supervisor	Mostafa Ansari (In Progress) , Concordia University Thesis/Project Title: Cyber security analysis of wind energy in smart grids Present Position: started in April 2022
2021/1 - 2025/1 Principal Supervisor	Zadsar, Masoud (In Progress) , Concordia University Student Degree Expected Date: 2025/1 Thesis/Project Title: Cyber security assessment of wide area monitoring systems Present Position: started on Jan. 2021, student
2021/1 - 2025/1 Principal Supervisor	Abazari, Ahmadreza (In Progress) , Concordia University Student Degree Expected Date: 2025/1 Thesis/Project Title: Modeling and analysis of cyber attacks on large-scale integration of electric vehicle in smart grids Present Position: started on Jan. 2021, student
2020/6 - 2022/8 Co-Supervisor	Lei, Meng (In Progress) , The Hong Kong Polytechnic University Student Degree Expected Date: 2022/8 Thesis/Project Title: Subsynchronous interaction problems in power systems with high penetration of power electronics-based devices Present Position: student

Event Administration

2024/5 - 2024/5	Workshop chair, International Conference On The Design Of Reliable Communication Networks 2024, Conference, 2024/5 - 2024/5
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Editorial Activities

2020/9 - 2023/9	Reviewer, IEEE Transactions on Dependable and Secure Computing, Journal
2019/9 - 2021/9	Reviewer, IEEE Transactions on Smart Grid, Journal
2019/9 - 2021/9	Reviewer, IEEE Transactions on Power Systems, Journal
2019/9 - 2021/9	Reviewer, Canadian Journal of Electrical and Computer Engineering, Journal
2019/9 - 2021/9	Reviewer, IEEE Transactions on Sustainable Energy, Journal
2020/7 - 2021/7	Guest editor, Smart Grid Communications section of Frontiers in Communications and Networks, Journal

Expert Witness Activities

2021/9 - 2022/2	Evaluator, FRQNT New Researcher Grant, the evaluation committee, Canada, montreal During this activity, I served as an evaluator in FRQNT New Researcher Grant, the evaluation committee
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Organizational Review Activities

- 2023/11 - 2024/2 Evaluator of research proposals, Fonds de recherche du Québec - Nature et technologies (FRQNT)
I am serving in a committee that evaluate the applications for FRQNT New Researchers proposals. We have received the proposals, evaluated them and discussed them in a committee
- 2021/11 - 2022/2 Evaluator of research proposals, Fonds de recherche du Québec - Nature et technologies (FRQNT)
I have served in a committee that evaluate the applications for FRQNT New Researchers proposals. We have received the proposals, evaluated them and discussed them in a committee

Knowledge and Technology Translation

- 2018/9 - 2021/9 Researcher and Postdoc fellowship, R&D Collaboration with Industry
Group/Organization/Business Served: Hydro-Quebec with Concordia University
Target Stakeholder: Utility
Outcome / Deliverable: - bi-weekly meetings - Preparing presentations - Publications and regular reports
Activity Description: - Preparing several progress report to be used by industrial partners - Presenting the outcomes of our research on presentations - Presenting the progress using bi-weekly meetings - Management of visits and on-site meetings
- 2018/9 - 2021/9 Researcher and Postdoc fellowship, R&D Collaboration with Industry
Group/Organization/Business Served: Thales Canada inc. with Concordia University
Target Stakeholder: Industry/Business (>500 employees)
Outcome / Deliverable: - bi-weekly meetings - Preparing presentations - Publications and regular reports
Activity Description: - Preparing several progress reports to be used by industrial partners - Presenting the outcomes of our research on presentations- Presenting the progress using bi-weekly meetings - Management of visits and on-site meetings
- 2014/9 - 2017/9 Researcher and PhD student, Consulting for Industry
Group/Organization/Business Served: Senvion Wind Farm manufacturer
Target Stakeholder: Industrial Association/Producer Group
Outcome / Deliverable: - Research report as part of a project defined between Hydro-Quebec, Senvion Wind Farm manufacturer, and Ecole polytechnique de Montreal
Evidence of Uptake/Impact: - The report studies the details of stability analysis of wind farm produced by Senvion and deployed in Gaspé Peninsula by Hydro-Quebec
Activity Description: The report studies the details of stability analysis of wind farm produced by Senvion and deployed in Gaspé Peninsula by Hydro-Quebec
Description: - It was one of the main deliverables of my Ph.D. program since the funding was awarded by Senvion to Polytechnique de Montreal to study the subsynchronous stability conditions of the wind turbines installed in Quebec and also propose several mitigation techniques to improve the operation of the power system and remove the risk of incidents like the one occurred in ERCOT system, Texas, 2009.

International Collaboration Activities

- 2021/5 - 2023/5 Researcher, United States of America
We joined forces with Prof. Yuhong Liu at Santa Clara University to work on the use of blockchain in the power system and its market applications

2018/6 - 2023/1 Researcher, Hong Kong
 I have collaboration with Dr. Ulas Karaggac. I worked with him when he was a research associate at Ecole polytechnique de montreal for my Ph.D. project. He joined The Hong Kong Polytechnic University as an assistant professor in June 2018. Since then, we collaborate together by applying for research grants, which one of them was successful and resulted in taking several graduate students in The Hong Kong Polytechnic University. We have also applied for several grants together and recruiting several graduate students for research purposes.

Committee Memberships

2020/4 Committee Member, Established University Research Centre with an emerging research platform, Concordia University
 The research center organizes the research activities of the security group of Concordia University and partners in the industry.

2020/3 Committee Member, Public Relations Committee (Advertising) & (Website), Concordia University

2020/3 Committee Member, Security Committee, Concordia University

2020/3 Committee Member, Supervision Committee, Concordia University

2020/3 Committee Member, Seminar Committee, Concordia University
 The seminar committee of Concordia Institute for Information Systems Engineering (CIISE) works on advancements of knowledge and technology sharing by inviting professors from around the world to present their research and have a seminar for graduate and undergraduate students to increase their knowledge and having a good idea about the current state-of-the-art in their research.

2021/6 - 2024/6 Committee Member, Council of the Gina Cody School of Engineering and Computer Science, Concordia University

Other Memberships

2014/1 Member, Institute of Electrical and Electronics Engineers (IEEE)

Presentations

1. (2023). Security of smart energy systems. IEEE International Conference on Prognostics and Health Management 2023, Montreal, Canada
 Main Audience: Researcher
 Invited?: Yes, Keynote?: Yes
2. Bhattacharya, Pratyusha; Debbabi, Mourad. (2021). The application of blockchain technology to improve the security of wide area monitoring systems. Hydro-Quebec Research Institute meeting, Canada
 Invited?: Yes, Keynote?: No
3. Karanfil, Mark; Ghafouri, Mohsen; Debbabi, Mourad. (2019). Cyber security analysis of microgrids. Research presentation, Hydro-Quebec Research institute, Varennes, Canada
 Main Audience: Researcher
 Invited?: Yes, Keynote?: No

Publications

Journal Articles

1. Ebtia, Afshin; Elhak Rebbah, Dhiaa; Ghafouri, Mohsen; Jafarigiv, Daniel; Debbabi, Mourad; Mohammadi, Arash. (2024). Spatial-Temporal Data-Driven Model for Load Altering Attack Detection in Smart Power Distribution Networks. IEEE Transactions on Industrial Informatics.
Accepted
Refereed?: Yes, Open Access?: No
2. Du, Hang; Yan, Jun; Ghafouri, Mohsen; Zgheib, Rawad; Debbabi, Mourad. (2024). Modeling and Detection of Cyber Attacks Targeting Converter-Driven Stability of Power Grids with PMSG-Based Wind Farms. IEEE Transaction on Power System.
Accepted
Refereed?: Yes, Open Access?: No
3. Zandian, Mahdi; Ameli, Amir; Ghafouri, Mohsen; Hassani, Reza; Rezaei-Zare, Afshin. (2024). A Framework to Avoid Maloperation of Transformer Differential Protection under Geomagnetic Disturbances. Transactions on Power Delivery.
Accepted
Refereed?: Yes, Open Access?: No
4. Ahmadzadeh, Masoud; Abazari, Ahmadreza; Ghafouri, Mohsen; Ameli, Amir; Muyeen, S. M. (2024). A Deep Convolutional Neural Network-Based Approach to Detect False Data Injection Attacks on PV-Integrated Distribution Systems. IEEE Access.
Published
Refereed?: Yes
5. Xue, Tao*; Karaagac, Ulas; Ghafouri, Mohsen. (2023). Impact of DFIG impedance model precision on stability analysis. Energy Reports.
Published
Refereed?: Yes, Open Access?: No
6. Sayed, MA*; Ghafouri, M; Atallah, R; Debbabi, M; Assi, Ch. (2023). Protecting the future grid: An electric vehicle robust mitigation scheme against load altering attacks on power grids. Applied Energy.
Published
Refereed?: Yes, Open Access?: No
7. Abazari, A*; Soleymani, MM*; Zadsar, M*; Ghafouri, M; Assi, Ch; Shafie-khah, M. (2023). Online Recursive Detection and Adaptive Fuzzy Mitigation of Cyber-Physical Attacks Targeting Topology of IMG: An LFC Case Study. IEEE Transaction on Smart Grid.
Published
Refereed?: Yes, Open Access?: No
8. Lei, Meng*; Karaagac, Ulas; Ghafouri, Mohsen; Stepanov, Anton; Mahseredjian, Jean. (2023). A new stationary frame multi-input multi-output EMT-level frequency scanning method for inverter based resources. Energy Reports.
Published
Refereed?: Yes
9. Ghafouri, Mohsen; Karaagac, Ulas; Mahseredjian, Jean; Kocar, Ilhan; Lei, Meng. (2023). Design of a robust and practicable SSI damping controller using H_{∞} technique for series compensated DFIG-based wind farms. Energy Reports.
Published
Refereed?: Yes

10. Asghari, M*; Ameli, A; Ghafouri, M; Kirakosyan, A;. (2023). An Optimal Cyber-Physical Attack Strategy Against DC Microgrids. International Journal of Electrical Power & Energy Systems.
Revision Requested
Refereed?: Yes, Open Access?: No
11. Zadsar, Masoud*; Ghafouri, Mohsen; Ameli, Amir; Moussa, Bassam. (2023). Preventing Time-Synchronization Attacks on Synchrophasor Measurements of Wide-Area Damping Controllers. IEEE Transactions on Instrumentation and Measurement.
Published
Refereed?: Yes, Open Access?: No
12. Karanfil, Mark *; Rebbah, Dhiaa Elhak*; Debbabi, Mourad; Kassouf, Marthe; Ghafouri, Mohsen; Hanna, Aiman. (2022). Detection of Microgrid Cyberattacks using Network and System Management. IEEE Transaction on Smart Grid.
Published
Refereed?: Yes, Open Access?: No
13. Vahidi, S*; Ghafouri, M; Au, M; Kassouf, M; mohammadi, A; Debbabi, M. (2022). Security of Wide-Area Monitoring, Protection and Control (WAMPAC) Systems: A Survey on Challenges and Opportunities. IEEE Communications Surveys and Tutorials.
Published
Refereed?: Yes, Open Access?: No
14. Abazari, Ahmadreza*; Ghafouri, Mohsen; Atallah, Ribal; Assi, Chadi. (2022). Electric Vehicle Switching Attacks Against Subsynchronous Stability of Power Systems. IEEE Transaction on Smart Grid.
Submitted
Refereed?: Yes, Open Access?: No
15. Bhattacharya, P*; Ghafouri, M; Soeanu, A; Kassouf, M; Debbabi, M. (2022). Security Enhancement of Time Synchronization and Fault Identification in WAMS Using a Two-layer Blockchain Framework. Applied Energy.
Published
Refereed?: Yes, Open Access?: No
16. Zadsar*, M; Abazari*, A; Ameli, A; Yan, J; Ghafouri, M. (2022). Prevention and Detection of Coordinated False Data Injection Attacks on Integrated Power and Gas Systems. IEEE Transaction on Power Systems.
Published
Refereed?: Yes, Open Access?: No
17. Ghafouri, M; Moussa, B; Kabir, M*; Assi, Ch. (2022). Coordinated Charging and Discharging of Electric Vehicles: A New Class of Switching Attacks. ACM Transactions on Cyber-Physical systems.
Published
Refereed?: Yes, Open Access?: No
18. Rahiminejad, A*; Ghafouri, M; Atallah, R; Lucia, W; Debbabi, M; Mohammadi A. (2022). Resilience Enhancement of Islanded Microgrid by Diversification, Reconfiguration, and DER Placement/Sizing. International Journal of Electrical Power & Energy Systems.
Published
Refereed?: Yes, Open Access?: No
19. Sarjan, Hamed; Ameli, Amir; Ghafouri, Mohsen. (2022). Cyber-Security of Industrial Internet of Things in Electric Power Systems. IEEE Access.
Published
Refereed?: Yes, Open Access?: No

20. Mohajer Hamidi, Shayan*; Ameli, Amir; Ghafouri, Mohsen. (2022). A Learning-Based Framework for Locating Faults on Power Grid Lines Based on Distortion of Travelling Waves. IEEE Transactions on instrumentation and measurement.
Published
Refereed?: Yes
21. Abazari, Ahmadreza*; Zadsar, Masoud*; Ghafouri, Mohsen; Atallah, Ribal; Assi, Chadi. (2022). A Data-mining/ANFIS and Adaptive Control for Detection and Mitigation of Attacks on DC MGs. IEEE Transactions on Smart Grids.
Published
Refereed?: Yes, Open Access?: No
22. Arzani, M*; Abazari, A*; Oshnoei, A*; Ghafouri, M; Muyeen, SM. (2021). Optimal Distribution Coefficients of Energy Resources in Frequency Stability of Hybrid Microgrids Connected to the Power System. Electronics.
Published
Refereed?: Yes, Open Access?: Yes
23. Kabir, E*; Ghafouri, M; Moussa, B; Assi, Ch. (2021). A Two-Stage Protection Method for Detection and Mitigation of Coordinated EVSE Switching Attacks. IEEE Transactions on Smart Grid.
Published
Refereed?: Yes, Open Access?: No
24. Zadsar*, M; Ansari*, M; Ameli, A; Abazari*, A; Ghafouri, M. (2021). A Two-Stage Framework for Coordination of Preventive and Corrective Resiliency Enhancement Strategies in Power and Gas Distribution Systems. International Journal of Electrical Power and Energy Systems.
Published
Refereed?: Yes, Open Access?: No
25. Ghafouri, M; Karaagac, U; Kocar, I; Xu, Z; Farantatos, E. (2021). Analysis and Mitigation of the Communication Delay Impacts on Wind Farm Central SSI Damping Controller. IEEE Access.
Published
Refereed?: Yes, Open Access?: Yes
26. Albarakati, A*; Robillard, Ch*; Karanfil, M*; Kassouf, M; Debbabi, M; Youssef, A; Ghafouri, M; Hadjidj, R. (2021). Security monitoring of IEC 61850 substations using IEC 62351-7 network and system management. IEEE Transactions on Industrial Informatics.
Published
Refereed?: Yes, Open Access?: No
27. Antoun, J*; Kabir, M*; Atallah, R; Moussa, B; Ghafouri, M; Assi, C. (2021). Assisting Residential Distribution Grids in Overcoming Large Scale EV Preconditioning Load. IEEE System Journal.
Published
Refereed?: Yes, Open Access?: No
28. Amini, A*; Ghafouri, M; Mohammadi, A; Hou, M; Asif, A; Plataniotis, K. (2021). Secure Sampled-data Observer-based Control for Wind Turbine Oscillation Under Cyber Attacks. IEEE Transactions on Smart Grid.
Accepted
Refereed?: Yes, Open Access?: No
29. Ghafouri, M; Karaagac, U; Ameli, A; Yan, J; Assi, Ch. (2021). A Cyber Attack Mitigation Scheme for Series Compensated DFIG-Based Wind Parks. IEEE Transactions on Smart Grid.
Published
Refereed?: Yes, Open Access?: No

30. Rahiminejad, A*; Plotnek, J; Atallah, R; Dubois, M A; Malatrait, D; Ghafouri, M; Mohammadi, A; Debbabi, M. (2021). A Resilience-Based Recovery Scheme for Smart Grid Restoration Following Cyberattacks to Substations. *International Journal of Electrical Power & Energy Systems*.
Published
Refereed?: Yes, Open Access?: No
31. Ameli, A; Ghafouri, M; Al-Saadany, E; Salama, M. (2021). An Auxiliary Framework to Mitigate Measurement Inaccuracies Caused by Capacitive Voltage Transformers. *IEEE Transactions on Instrumentation and Measurement*.
Published
Refereed?: Yes, Open Access?: No
32. Babaei, M*; Abazari, A*; Soleymani, M*; Ghafouri, M; Muyeen, SM; Beheshti, M. (2021). A data-mining based optimal demand response program for smart home with energy storages and electric vehicles. *Journal of Energy Storage*.
Published
Refereed?: Yes, Open Access?: No
33. Ghafouri, M; Au, M; Kassouf, M; Debbabi, M; Assi, Ch; Yan, J. (2020). Detection and Mitigation of Cyber Attacks on Voltage Stability Monitoring of Smart Grids. *IEEE Transactions on Smart Grid*.
Accepted
Refereed?: Yes, Open Access?: No
34. Ameli, A; Ghafouri, M; Zeineldin, H; Al-Saadany, E; Salama, M. (2020). Accurate Fault Diagnosis in Transformers Using an Auxiliary Current-Compensation-Based Framework for Differential Relays. *IEEE Transactions on Instrumentation and Measurement*.
Published
Refereed?: Yes, Open Access?: No
35. Abazari, A*; Soleymani, M* ;Kamwa, I; Babaei, M*; Ghafouri, M; Muyeen, M; Foley, A. (2020). A Reliable and Cost-effective Rural Area Hybrid Power System including Renewable Resources Considering Intelligent Weather Forecasting. *Energy Reports*.
Published
Refereed?: Yes, Open Access?: No
36. Abazari, A*; Soleymani, M*; Babaei, M*; Ghafouri, M; Monsef, H; Beheshti, M. (2020). High Penetrated RESs-based Adaptive Optimal Model Predictive Control (AOMPC) for Microgrid's Frequency Regulation during Weather Changes, Time-varying Parameters and Generation Unit Collapse. *IET Generation, Transmission & Distribution*.
Published
Refereed?: Yes, Open Access?: No
37. Ghafouri, M; Karaagac, U; Mahseredjian, J; Karimi, H. (2019). SSCI Damping Controller Design for Series-Compensated DFIG-Based Wind Parks Considering Implementation Challenges. *IEEE Transactions on Power Systems*. 34(4): 2644 - 2653.
Published
Refereed?: Yes, Open Access?: No
38. Akaber, P*; Moussa, B; Ghafouri, M; Atallah, R; Agba, B; Assi, Ch; Debbabi, M. (2019). CAsES: Concurrent Contingency Analysis-Based Security Metric Deployment for the Smart Grid. *IEEE Transactions on Smart Grid*. 11(3): 2676 - 2687.
Published
Refereed?: Yes, Open Access?: No
39. Ghafouri, M; Karaagac, U; Karimi, H; Mahseredjian, J. (2019). Robust subsynchronous interaction damping controller for DFIG-based wind farms. *Journal of Modern Power Systems and Clean Energy*. 7(6): 1663 - 1674.
Published
Refereed?: Yes, Open Access?: No

Book Chapters

1. Asghari, M.*; Ameli, A.; Ghafouri, M.; Uddin M. N. (2022). Application of State Observers and Filters in Protection and Cyber Security of Power Grids. Parizad, A.; Baghaee H. R.; Rahman S. Cyber Physical Power Systems: Challenges and Solutions By AI/ML, Big Data, Blockchain, IoT, And Information Theory Paradigms. : 1-70.
Submitted, IEEE Press
Refereed?: Yes
2. Riahinia, S*; Ameli, A.; Ghafouri, M.; Yassine, A. (2022). Cyber Security of Protection System in Power Grids Part 2: Case Studies on Securing Line Current Differential Relays. Alhelou H, H; Hatziargyriou, N; Dong Z. Y. Power Systems Cybersecurity. : 1-35.
Accepted, Springer
Refereed?: Yes
3. Riahinia, S*; Ameli, A, Ghafouri, M; Yassine, A. (2022). Cyber Security of Protection System in Power Grids Part 1: Vulnerabilities and Counter Measures. Alhelou H, H; Hatziargyriou, N; Dong Z. Y. Power Systems Cybersecurity. : 1-35.
Accepted, Springer
Refereed?: Yes

Conference Publications

1. Riahinia, Shahin*; Ameli, Amir; Ghafouri, Mohsen; Yassine, Abdulsalam. (2023). Recursive Least-Square-Based Parameter Estimation for Dynamic State Estimation in Power Grids. IEEE Industrial Electronics Society Annual Online Conference (ONCON),
Paper
Accepted
Refereed?: Yes, Invited?: No
2. Rahiminejad, Abolfazl; Duman, Onur; Ghafouri, Mohsen; Atallah, Ribal; Mohammadi, Arash; Debbabi, Mourad. (2023). A Resilience Quantitative Framework for Wide Area Damping Control Against Cyberattacks. 2023 IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT),
Paper
Published
Refereed?: Yes, Invited?: No
3. Babaei Vavdareh, Masoud*; Ghafouri, Mohsen; Ameli, Amir. (2023). Detection and Mitigation of False Data Injection Attacks on Wide Area Damping Controllers. IEEE Industrial Electronics Society Annual Online Conference (ONCON),
Paper
Accepted
Refereed?: Yes, Invited?: No
4. Ansari, Mostafa*; Ghafouri, Mohsen; Ameli, Amir. (2023). Cybersecurity Vulnerabilities in Phase-Locked Loop (PLL) of DFIG-Based Wind Power Plants. IEEE Industrial Electronics Society Annual Online Conference (ONCON),
Paper
Accepted
Refereed?: Yes, Invited?: No
5. Zadsar, Masoud*; Ghafouri, Mohsen; Ameli, Amir. (2023). Cyber Attack-Aware Security Hardening of Time Synchronization Technologies in WAMPAC Systems. IEEE Industrial Electronics Society Annual Online Conference (ONCON),
Paper
Accepted
Refereed?: Yes, Invited?: No

6. Rahiminejad, Abolfazl; Ghafouri, Mohsen; Atallah, Ribal; Mohammadi, Arash; Debbabi, Mourad. (2023). A Real-time Quantitative Framework for Survivability Evaluation of Smart Grids. IEEE Power & Energy Society General Meeting (PESGM),
Paper
Published
Refereed?: Yes, Invited?: No
7. Y. Li*, L. Hou, J. Yan, Y. Liu, M. Ghafouri and P. Zhang. (2023). A Two-Stage Packetized Energy Trading and Management Framework for Virtual Power Plants. IEEE Power & Energy Society General Meeting (PESGM),
Paper
Published
Refereed?: Yes, Invited?: No
8. Karanfil, Mark; Youssef, El-Nasser; Kassouf, Marthe; Debbabi, Mourad; Ghafouri, Mohsen; Hanna, Aiman. (2023). Real-time Protection Against Microgrid False Data Injection Attacks Using Passive Monitoring. 2023 IEEE Power & Energy Society General Meeting (PESGM),
Paper
Published
Refereed?: Yes, Invited?: No
9. Asghari, Mohammadmahdi *; Ameli, Amir; Ghafouri, Mohsen; Uddin, Mohammad Nasir. (2023). Unveiling a New Vulnerability in Modern Power Systems: Leveraging Publicly-Available LMPs for Crafting Cyber-Attacks. IEEE Industrial Electronics Society Annual Online Conference (ONCON),
Paper
Accepted
Refereed?: Yes, Invited?: No
10. Ansari, Mostafa; Ghafouri, Mohsen; Ameli, Amir. (2022). Cyber-Security Vulnerabilities of the Active Power Control Scheme in Large-Scale Wind-Integrated Power Systems. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No
11. Sayed, Mohammad Ali*; Ghafouri, Mohsen; Debbabi, Mourad; Assi, Chadi. (2022). Dynamic Load Altering EV Attacks Against Power Grid Frequency Control. IEEE PES General Meeting,
Paper
Accepted
Refereed?: Yes, Invited?: No
12. Du, Hang; Yan, Jun; Ghafouri, Mohsen; Zgheib, Rawad; Debbabi, Mourad. (2022). Online Attack-aware Risk Management for PMSG-based Wind Farm Depending on System Strength Evaluation. 2022 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm),
Paper
Published
Refereed?: Yes, Invited?: No
13. Babazadeh-Dizaji, Ramin; Ghaderi, Mohammad Hassan; Ghafouri, Mohsen; Hamzeh, Mohsen. (2022). A Dynamic Series Voltage Regulator for Load Protection in Bipolar DC Power System. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No

14. Sarjan, HAMED; Ameli, Ameli; Ghafouri, Mohsen. (2022). On Propagation of Cyber-Attacks in Wide-Area Measurement Systems. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No
15. Zadsar, Masoud; Ghafouri, Mohsen; Ameli, Ameli; Moussa, Bassam. (2022). Time-Synchronization Attack on Data Aggregation in Wide-Area Damping Controllers. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No
16. Li, Yuanliang; Hou, Luyang; Du, Hang; Yan, Jun; Liu, Yuhong; Ghafouri, Mohsen; Zhang, Peng. (2022). PEMT-CoSim: A Co-Simulation Platform for Packetized Energy Management and Trading in Distributed Energy Systems. 2022 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm),
Paper
Published
Refereed?: Yes, Invited?: No
17. Asghari, Mohammad Mehdi; Ameli, Amir; Ghafouri, Mohsen. (2022). On the Economic Vulnerability Analysis of Power Grids to False Data Injection Attacks against Wide Area Measurement Systems. 1st IEEE Industrial Electronics Society,
Paper
Published
Refereed?: Yes, Invited?: No
18. Abazari, Ahmadreza; Ghafouri, Mohsen; Atallah, Ribal; Assi, Chadi. (2022). Detection and Mitigation Methods of Attacks on Low-inertia Hybrid Microgrids: A Short Survey. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No
19. Abazari, Ahmadreza*; Zadsar, Zadsar*; Ghafouri, Mohsen; Assi, Chadi. (2022). Detection of Cyber-Physical Attacks Using Optimal Recursive Least Square in an Islanded Microgrid. IEEE PES General meeting,
Paper
Accepted
Refereed?: Yes, Invited?: No
20. Babaei Vavdareh, Masoud; Ghafouri, Mohsen; Ameli, Amir. (2022). A Cooperative Robust Fractional-order PID Controller for Frequency Control in Islanded Microgrids. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No
21. Ahmadzadeh, Masoud; Abazari, Ahmadreza; Ghafouri, Mohsen. (2022). Detection of FDI Attacks on Voltage Regulation of PV-Integrated Distribution Grids Using Machine Learning Methods. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No

22. Rahiminejad, A*; Ghafouri, M; Atallah, R; Mohammadi, A; Debbabi, M. (2021). A Cyber-Physical Resilience-Based Survivability Metric against Topological Cyberattacks. Innovative Smart Grid Technologies (ISGT 2022), Washington D.C., United States of America
Paper
Accepted
Refereed?: Yes, Invited?: No
23. Zadsar, M*; Abazari, A*; Ansari, M*; Ghafouri, M; Muyeen, SM; Blaabjerg, F. (2021). Central Situational Awareness System for Resiliency Enhancement of Integrated Energy Systems. 2021 IEEE 4th International Conference on Computing, Power and Communication Technologies (GUCON),
Paper
Accepted
Refereed?: Yes, Invited?: No
24. Karanfil, M*; Rebbah, D E*; Ghafouri, M; Kassouf, M; Debbabi, M; Hanna, A. (2021). Security Monitoring of the Microgrid Using IEC 62351-7 Network and System Management. Innovative Smart Grid Technologies (ISGT 2022), Washington D.C., United States of America
Paper
Accepted
Refereed?: Yes, Invited?: No
25. Rebbah, D E*; Ebtia, A*; Ghafouri, M; Kassouf, M; Atallah, M; Debbabi, M; Mohammadi, A. (2021). Real-Time Co-simulation Platform for Security Analysis of Distribution Automation Systems. Innovative Smart Grid Technologies (ISGT 2022), Washington D.C., United States of America
Paper
Accepted
Refereed?: Yes, Invited?: No
26. Du, H*; Yan, J; Ghafouri, M; Zgheib, R; Kassouf, M; Debbabi, M. (2021). Modeling of Cyber Attacks Against Converter-Driven Stability of PMSG-Based WindFarms with Intentional Subsynchronous Resonance. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids, Aachen, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
27. Vahidi, S*; Amini, A; Ghafouri, M; Au, M; Kassouf, M; Mohammadi, A; Debbabi, M. (2021). Resilient Periodic Observer-based Control for Wide Area Oscillation Damping Against Time Synchronization Attacks. Innovative Smart Grid Technologies (ISGT 2022), Washington D.C., United States of America
Paper
Accepted
Refereed?: Yes, Invited?: No
28. Antoun, J*; Kabir, M*; Atallah, R; Moussa, B; Ghafouri, M; Assi, C. (2020). Impact Analysis of EV Preconditioning on the Residential Distribution Network. SmartGridComm 2020: IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids,
Paper
Published
Refereed?: Yes, Invited?: No
29. Duman, O*; Ghafouri, M; Kassouf, M; Atallah, R; Wang, L; Debbabi, M. (2019). Modeling Supply Chain Attacks in IEC 61850 Substations. 2019 IEEE SmartGridComm. 2019 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No



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Date Submitted: 2023-08-06 23:05:02

Confirmation Number: 1631125

Template: NSERC_Researcher

Dr. Roch Glitho

Correspondence language: French

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Protected when completed

Dr. Roch Glitho

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes

Degrees

- 2002/4 Doctorate, Tele-informatics, Royal Institute of Technology
- 1990/1 Master's Thesis, Business Economics, Université des sciences sociales de Grenoble
- 1985/1 Master's Thesis, Mathematics, University of Geneva
- 1984/1 Master's Thesis, Computer Science, University of Geneva

User Profile

Research Specialization Keywords: Cloud / edge / fog computing, Hardware acceleration, Internet of Things / Tactile Internet, Network Function Virtualization (NFV), Software Defined Network (SDN)

Employment

- 2010/8 Professor and Ericsson/ENCQOR-5G Senior Industrial Research Chair
CIISE, Concordia University
Full-time, Term, Professor
Tenure Status: Tenure
- 2009/10 - 2010/7 Associate Professor
Genie Logiciel et Technologie de l'Information, École de technologie supérieure
Full-time, Term, Associate Professor
Tenure Status: Tenure Track
Teaching and Research in the broad area of Networking and Telecommunications
- 1993/7 - 2009/9 Expert
Research Department, Ericsson Canada
- 1990/5 - 1993/6 Senior Specialist
R & D Department, Ericsson Sweden
- 1986/1 - 1990/4 R&D Engineer
Hardware Development Department, Norsk Data AS Norway

Research Funding History

Awarded [n=11]

2022/4 - 2026/3 Principal Investigator	Softwarized Infrastructures for Tactile Internet Applications, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Total Funding - 175,000 Portion of Funding Received - 175,000 Funding Competitive?: Yes
2023/5 - 2025/4 Principal Investigator	Next Generation Clouds, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) elevate Total Funding - 706,666 Portion of Funding Received - 706,666 Funding Competitive?: Yes
2020/4 - 2024/3 Principal Investigator	Cloud and Edge Computing for 5G and Beyond, Research Chair Funding Sources: Ericsson Communication Inc. Research Chair Total Funding - 914,740 Portion of Funding Received - 914,740 Funding Competitive?: Yes ENCQOR 5G Academic collaboration Total Funding - 1,293,180 Portion of Funding Received - 1,293,180 Funding Competitive?: Yes
2021/4 - 2024/3 Co-applicant	Efficient Algorithmic and Architectural Solutions for Tele-Surgery Type Applications in Tactile Internet, Grant Funding Sources: Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) Equipe Total Funding - 190,500 Portion of Funding Received - 63,500 Funding Competitive?: Yes
2020/2 - 2022/2 Principal Applicant	Smart Collaborative cOmputing, caching and netwoRking paradlgm for Next Generation, Grant Funding Sources: Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) CHIST-ERA Total Funding - 101,210 Portion of Funding Received - 101,210 Funding Competitive?: Yes
2017/4 - 2021/3 Principal Investigator	Applications and Service Architectures for Internet of Things, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery

Total Funding - 130,000
 Portion of Funding Received - 130,000
 Funding Competitive?: Yes

2015/10 - 2020/9
 Principal Applicant End-User Service Engineering for Communications Networks, Research Chair

Funding Sources:
 Canada Research Chairs (CRC)
 Canada Research Chair - Tiers II
 Total Funding - 500,000
 Portion of Funding Received - 225,000
 Funding Competitive?: Yes

2019/4 - 2020/3
 Principal Investigator Clouds Augmented with Fogs for QoE Enabled IoT Applications, Grant

Funding Sources:
 Cisco Systems
 Collaborative Research Initiative
 Total Funding - 125,000
 Portion of Funding Received - 125,000
 Funding Competitive?: Yes

2019/4 - 2020/3
 Principal Investigator Automation of Edge Data Centers Enabled - Cloud Data Operation and Management, Grant

Funding Sources:
 Mathematics of Information Technology and Complex Systems (MITACS)
 Elevate program
 Total Funding - 130,000
 Portion of Funding Received - 130,000
 Funding Competitive?: Yes

2018/3 - 2020/2
 Principal Investigator Edge Computing for Content Delivery Networks, Grant

Funding Sources:
 Ericsson Research Canada
 CRD
 Total Funding - 50,000
 Portion of Funding Received - 50,000
 Funding Competitive?: Yes
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 CRD
 Total Funding - 30,334
 Portion of Funding Received - 30,334
 Funding Competitive?: Yes

2019/2 - 2020/1
 Principal Investigator Automating Configuration and Performance Management of Data Centers, Grant

Funding Sources:
 Mathematics of Information Technology and Complex Systems (MITACS)
 Elevate program
 Total Funding - 130,000
 Portion of Funding Received - 130,000
 Funding Competitive?: Yes

Completed [n=3]

2016/7 - 2018/6
 Principal Applicant Architectures and Algorithms for Next Generation Content Delivery Networks, Grant

Funding Sources:
 Natural Sciences and Engineering Research Council of Canada (NSERC)

NSERC CRD
 Total Funding - 130,956
 Portion of Funding Received - 130,956
 Funding Competitive?: Yes
 Ericsson Research Canada
 NSERC CRD
 Total Funding - 65,478
 Portion of Funding Received - 65,478
 Funding Competitive?: Yes

2017/3 - 2018/2
 Principal Investigator
 CDN to the Home, Grant
Funding Sources:
 Mathematics of Information Technology and Complex Systems (MITACS)
 Total Funding - 30,000
 Portion of Funding Received - 30,000
 Funding Competitive?: Yes

2016/10 - 2017/9
 Principal Applicant
 Content Delivery Networks over Dirty Slate ICN in 5G, Grant
Funding Sources:
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 CRD
 Total Funding - 30,334
 Portion of Funding Received - 30,334
 Funding Competitive?: Yes
 Ericsson Research Canada
 CRD
 Total Funding - 50,000
 Portion of Funding Received - 50,000
 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=7]

2021/9 - 2023/8
 Principal Supervisor
 Farzaneh Ghassemi (In Progress) , Concordia University
 Student Degree Expected Date: 2023/8
 Thesis/Project Title: Tactile Internet
 Present Position: Research assistant, Concordia University

2021/9 - 2023/8
 Principal Supervisor
 Zarin Tasnim (In Progress) , Concordia University
 Student Degree Expected Date: 2023/8
 Thesis/Project Title: Tactile Internet
 Present Position: Research assistant, Concordia University

2020/9 - 2023/4
 Principal Supervisor
 Prateek Bagora (Completed) , Concordia University
 Thesis/Project Title: Machine Learning for Fault Management
 Present Position: Research assistant, Concordia University

2018/9 - 2021/6
 Principal Supervisor
 Jasmeen Ahluwalia (Completed) , Concordia University
 Thesis/Project Title: IoT Virtualization
 Present Position: Software developer, Ubisoft

2018/5 - 2020/7
Principal Supervisor Yassine Jebbar (Completed) , Concordia University
Thesis/Project Title: Tactile Internet
Present Position: Data Engineering Analyst, National Bank of Canada

2017/9 - 2020/6
Principal Supervisor Ferresteh Ebrahimmzad (Completed) , Concordia University
Thesis/Project Title: IoT PaaS architectures
Present Position: Cloud Engineer, PNI Digital Media LTD Vancouver

2017/5 - 2020/8
Principal Supervisor Farinaz Razouli (Completed) , Concordia University
Thesis/Project Title: Tactile Internet Algorithms
Present Position: Rsearcher, IBM Vancouver

Doctorate [n=21]

2026/5 - 2026/5
Principal Supervisor Fatemeh Ali Akbari (In Progress) , Concordia University
Student Degree Expected Date: 2025/5
Thesis/Project Title: collaborative communication caching and computing
Present Position: Research assistant, Concordia University

2022/9 - 2027/8
Principal Supervisor Khadije Shahsavand (In Progress) , Concordia University
Student Degree Expected Date: 2027/8
Thesis/Project Title: Energy Efficient 5G and beyond
Present Position: PhD student, Concordia University

2021/9 - 2025/8
Principal Supervisor Sasan Sabour (In Progress) , Concordia University
Student Degree Expected Date: 2026/8
Thesis/Project Title: Cloud and Edge Computing for 5G and Beyond
Present Position: Research assistant, Concordia University

2021/9 - 2025/8
Principal Supervisor Nafiseh Daemi (In Progress) , Concordia University
Student Degree Expected Date: 2026/8
Thesis/Project Title: Cloud and Edge Computing for 5G and Beyond
Present Position: Research assistant, Concordia University

2021/9 - 2025/8
Principal Supervisor Azadeh Azhdari (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: Cloud and Edge for 5G and Beyond
Present Position: Research assistant, Concordia University

2020/9 - 2025/9
Principal Supervisor Mahsa Raeiszadeh (In Progress) , Concordia University
Student Degree Expected Date: 2025/9
Thesis/Project Title: Data driven cloud operations
Present Position: Research assistant, Concordia University

2020/9 - 2025/9
Principal Supervisor Ahsan Saleem (In Progress) , Concordia University
Student Degree Expected Date: 2025/9
Thesis/Project Title: Real time clouds
Present Position: Research assistant, Concordia University

2020/9 - 2025/9
Principal Supervisor Hoda Sedigni (In Progress) , Concordia University
Student Degree Expected Date: 2025/9
Thesis/Project Title: Hardware acceleration
Present Position: Research assistant, Concordia University

2019/9 - 2024/9
Principal Supervisor Behshid Shayesteh (In Progress) , Concordia University
Student Degree Expected Date: 2024/9
Thesis/Project Title: Fault detection and prevention in clouds
Present Position: Research assistant, Concordia University

- 2018/5 - 2023/5
Principal Supervisor Francis Boabang (In Progress) , Concordia University
Student Degree Expected Date: 2023/5
Thesis/Project Title: Tactile Internet
Present Position: Research assistant, Concordia University
- 2018/1 - 2023/1
Principal Supervisor Razieh Abbasi (In Progress) , Concordia University
Student Degree Expected Date: 2023/1
Thesis/Project Title: Fault Management in Clouds
Present Position: Research assistant, Concordia University
- 2017/9 - 2022/5
Principal Supervisor Nattakorn Promwongsa (Completed) , Concordia University
Thesis/Project Title: Tactile Internet
Present Position: Research assistant, Concordia University
- 2017/9 - 2022/12
Principal Supervisor Negar Afrasiabi (In Progress) , Concordia University
Student Degree Expected Date: 2022/12
Thesis/Project Title: Service Function in Continuum Cloud Edge
Present Position: Research assistant, Concordia University
- 2016/8 - 2022/2
Principal Supervisor Marsa Rayani (Completed) , Concordia University
Thesis/Project Title: Information Centric Network based CDN
Present Position: Research assistant, Concordia University
- 2016/8 - 2022/2
Principal Supervisor Sepideh Malek Taji (Completed) , Concordia University
Thesis/Project Title: Machine Learning for content delivery networks
Present Position: Research assistant, Concordia University
- 2016/5 - 2023/6
Principal Supervisor Vahid Maleki Raei (Completed) , Concordia University
Thesis/Project Title: IoT Virtualization
Present Position: Research assistant, Concordia University
- 2015/1 - 2018/7
Co-Supervisor Shoreh Ahvar (Completed) , Telecom Sud Paris
Thesis/Project Title: Service Function Chaining
Present Position: Associate Professor, ISEP Paris France
- 2014/4 - 2018/12
Principal Supervisor Carla Mouradian (Completed) , Concordia University
Thesis/Project Title: IoT Architectures for large scale disaster scenarios
Present Position: Experienced Researcher, Ericsson
- 2013/1 - 2018/12
Principal Supervisor Mohammed Abu Lebdeh (Completed) , Concordia University
Thesis/Project Title: Service Architectures for 4G EPC
Present Position: Cloud Architect
- 2012/9 - 2018/12
Principal Supervisor Narjes Tahghigh (Completed) , Concordia University
Thesis/Project Title: Network Function Virtualization based - Architectures for Content Delivery Networks
Present Position: Cloud Architect, IBM
- 2012/9 - 2018/12
Principal Supervisor Abbas Soltanian (Completed) , Concordia University
Thesis/Project Title: Architectures for Cloud Based Multimedia Applications
Present Position: Cloud Architect, Genvid Technologies Inc.

Post-doctorate [n=6]

- 2021/5 - 2023/4
Principal Supervisor Amina Hentati (In Progress) , Concordia University
Student Degree Expected Date: 2023/4
Thesis/Project Title: Algorithms for IoT and Tactile Internet
Present Position: Postdoctoral student, Concordia University

2019/12 - 2022/12 Principal Supervisor	Amin Ebrahimzadeh (In Progress) , Concordia University Student Degree Expected Date: 2022/12 Thesis/Project Title: Tactile Internet Present Position: Horizon postdoctoral student, Concordia University
2019/3 - 2021/3 Principal Supervisor	Carla Mouradian (Completed) , Concordia University Thesis/Project Title: Architectures and algorithms for VNF placement Present Position: Experienced Researcher, Ericsson
2019/2 - 2021/2 Principal Supervisor	Mohammad Abu-Lebdeh (Completed) , Concordia University Thesis/Project Title: Hardware acceleration for clouds Present Position: Site reliability Engineer, Ericsson
2018/1 - 2020/1 Principal Supervisor	Somayeh Kianpisheh (Completed) , Concordia University Thesis/Project Title: Algorithms for CDN, IoT, and Tactile Internet Present Position: Postdoctoral student, Alto University, Finland
2016/2 - 2018/2 Principal Supervisor	Diala Naboulsi (Completed) , Concordia University Thesis/Project Title: Algorithms for next generation CDNs, IMS and IoT Present Position: Assistant Professor, Ecole de Technologie Superieure - ETS

Editorial Activities

2015/1 - 2025/12	Member of Advisory Board, IEEE Communications Surveys and Tutorials, Journal
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Organizational Review Activities

2022/5 - 2022/5	PhD Thesis Examiner, IMSP-UAC Republic of Benin Connecting the Unconnected: Solutions for Closing Digital Gap in Rural Areas
2022/5 - 2022/5	PhD Thesis Examiner, National Institute of Technology, Tiruchrappalli. India Latency Sensitive CPU-Intensive Task Scheduling in Fog Nodes
2021/12 - 2021/12	PhD Thesis Examiner, INSA Toulouse, France Towards a coordination-free orchestration approach to manage consistent service reconfiguration in NFV multi-domain environments
2021/3 - 2021/3	PhD Thesis Examiner, University of La Rochelle, France IoT Service Placement with Load Distribution and Service Migration in Edge Computing for 5G Networks.
2019/12 - 2019/12	PhD Thesis Examiner, Ecole Polytechnique de Montreal Title: Internet of Things Design and Deployment in Industry Candidate: Ali Mohab
2019/11 - 2019/11	PhD thesis examiner, Anna University, Gindy, India PhD thesis evaluation Title: IntelligentClassification and Structure Aware Resource Estimation for Effective Executionof Workflows in the Cloud Candidate: K. Kanagaraj
2019/10 - 2019/10	PhD Thesis Examiner, INRS, Montreal PhD thesis evaluation Title Tactile Internet over Fiber – Wireless Enhanced HetNets Using Edge Intelligence Candidate Amin Ebrahimzadeh
2019/6 - 2019/6	PhD Thesis Examiner, Anna University, Gindy, India Title: Queue Based – Resource Allocation Model for Cloud Data Centers Candidate: A, Meera

2019/3 - 2019/3	PhD Thesis Examiner, Anna University, Gindy, India PhD thesis evaluation Title: PrivacyPreservation in Online Social Networks Candidate: TShanmuigapriya
2018/12 - 2018/12	PhD Thesis Examiner, ETS Montreal PhD thesis evaluation Title Optimizing Total Cost of Ownership (TCO) for 5G Multi-Tenant Mobile BackHaul (MBH) Optical Transport Networks Candidate Nassim Haddaji
2018/5 - 2018/5	PhD Thesis Examiner, University of Montreal PhD thesis evaluation Title: Quality of Service Aware Data Dissemination in Vehicular Ad HocNetworks (VANETs) Candidate: Mehdi Sharifi Rayeni
2018/4 - 2018/4	PhD Thesis Examiner, National Institute of Technology, Tiruchrappalli. India PhD thesis evaluation Title: Detection of of HTTP Flooding Attacks inCloud Candidate: T. Raja Sree
2017/6 - 2017/6	PhD Thesis Examiner, University of Cape Town, South Africa Title: DynamicService Orchestration in the IP Multimedia Subsystem Candidate: Richard Spiers

Committee Memberships

2021/2	Committee Member, IEEE Cloud Computing Steering Committee - Advisory Board, IEEE The IEEE Cloud Steering Committee has leaders from a wide array of societies and organizations across the IEEE, all with interests in the diverse technology of cloud computing. The Steering Committee guides the activities of IEEE Cloud Computing.
2020/9 - 2023/9	Committee Member, University Research Committee, Concordia University Oversees at University level competition for and adjudication of: - internal grants - Research chairs and endowed professorships
2020/10 - 2022/4	Co-chair, Faculty Development Subcommittee of President Task Force on Black Anti-Racism, Concordia University The task force's mandate is to oversee wide-ranging anti-racism efforts across Concordia in order to help the university better serve as a diverse and welcoming place with deep connections to the community.

Text Interviews

2021/02/22	How arts, culture and technology live under the hood of next-gen cities, Montreal Gazette newspaper
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Publications

Journal Articles

1. Fatemeh Aghaaliakbari* Zakaria Ait Hmitti, Marsa Rayani, Manel Gherari, Roch H. Glitho, Halima Elbiازه, and Wessam Ajib. (2023). An Architecture for Provisioning In-Network Computing Enabled Slices for Holographic Applications in Next-Generation Networks. IEEE Communications Magazine. 61(3): 52-58.
Published
Refereed?: Yes, Open Access?: No

2. S N Afrasiabi, A Ebrahimzadeh, N Promwongsa, C Mouradian, W Li, A Recse, R Szabo, R H Glitho. (2023). Cost-efficient Cluster Migration of VNFs for Virtualized Network Function Forwarding Graph Embedding. IEEE Transactions on Network and Service Management (TNSM). Early Access
Published
Refereed?: Yes
3. S Malektaji, M Rayani, A Ebrahimzadeh, VM Raei, H Elbiaze, RH Glitho,. (2023). Dynamic Joint VNF Forwarding Graph Composition and Embedding: A Deep Reinforcement Learning Framework. IEEE Transactions on Network and Service Management (TNSM),. Early Access
Published
Refereed?: Yes, Open Access?: No
4. M Dieye, W Jaafar, H Elbiaze, R Glitho. (2023). DRL - Based Green Resource Provisioning for 5G and Beyond Networks. IEEE Transactions on Green Networking and Communications (TGCN). Early Access
Published
Refereed?: Yes, Open Access?: No
5. Á Recse, N Promwongsa, A Ebrahimzadeh, S N Afrasiabi, C Mouradian, W Li, R Szabó, R H Glitho,. (2023). Look-ahead VNF-FG Embedding Framework for Latency-sensitive Network Services,. IEEE Transactions on Network and Service Management (TNSM). Early Access
Published
Refereed?: Yes, Open Access?: No
6. V M Raei, A Ebrahimzadeh, R H. Glitho, M El Barachi, F Belqasmi,. (2023). E2DNE: Energy Efficient Dynamic Network Embedding in Virtualized Wireless Sensor Networks. IEEE Transactions on Green Networking and Communications (TGCN). Early Access
Published
Refereed?: Yes, Open Access?: No
7. N. Promwongsa, A. Ebrahimzadeh, R Glitho, N Crespi. (2022). Joint VNF Placement and Scheduling for Latency-sensitive Services. IEEE Transactions on Network Science and Engineering (TNSE). 9(4): 2432-2449.
Published
Refereed?: Yes, Open Access?: No
8. SN Afrasiabi, A Ebrahimzadeh, C Mouradian, S Malektaji, RH Glitho. (2022). Reinforcement Learning-based Optimization Framework for Application Component Migration in NFV Cloud-Fog Environments. IEEE Transactions on Network and Service Management (TNSM). 20(2): 1866 - 1883.
Published
Refereed?: Yes
9. B Shayesteh, C Fu, A Ebrahimzadeh, R Glitho. (2022). Automated Concept Drift Handling for Fault Prediction in Edge Clouds using Reinforcement Learning. IEEE Transactions on Network and Service Management (TNSM). 19(2): 1321-1335.
Published
Refereed?: Yes, Open Access?: No
10. A Mseddi, MA Salahuddin, MF Zhani, H Elbiaze, R Glitho. (2021). Efficient Replica Migration Scheme for Distributed Cloud Systems. IEEE Transactions on Cloud Computing (Impact Factor 2020: 5.938). 9(1): 155 - 167.
Published
Refereed?: Yes, Open Access?: No
11. M. Rayani, A Ebrahimzadeh, R Glitho, H Elbiaze. (2021). Ensuring Profit and QoS when Dynamically Embedding Delay-Constrained ICN and IP Slices for Content Delivery. IEEE Transactions on Network Science and Engineering (TNSE). Early Access
Published
Refereed?: Yes, Open Access?: No

12. N. Promwongsa, A. Ebrahimzadeh, D. Naboulsi, S. Kianpisheh, F. Belqasmi, R. Glitho, N. Crespi, O. Alfandi,. (2021). A Comprehensive Survey of the Tactile Internet: State-of-the-art and Research Directions,. IEEE Communications Surveys and Tutorials (Impact Factor 2020: 25.249). 23(1): 472 - 523.
Published
Refereed?: Yes, Open Access?: Yes
13. S. Malek Taji, A. Ebrahimzadeh, H. Elbiaze, R. Glitho, S. Kianpisheh. (2021). An Optimization Framework for Content Migration in Edge-based Content Delivery Networks: A Deep Reinforcement Learning Approach. IEEE Transactions on Network and Service Management (TNSM) (Impact Factor 2020: 4.195).
Early access
Published
Refereed?: Yes
14. Ahvar; S Ahvar; Z Á Mann; N Crespi; R Glitho; J Garcia-Alfaro,. (2021). DECA: a Dynamic Energy cost and Carbonemission-efficient Application placement method for Edge Clouds,. IEEE Access (Impact Factor 2020:. 29: 70192 - 70213).
Published
Refereed?: Yes
15. Y. Jebbar, N. Promwongsa, F Belqasmi, R Glitho. (2021). A Case Study on the Deployment of a Tactile Internet Application in a Hybrid Cloud, Edge and Mobile Ad Hoc Cloud Environment,. IEEE Systems Journal (Impact factor 2020: 3.931). Early access
Published
Refereed?: Yes, Open Access?: No
16. V Maleki Raee, A Ebrahimzadeh, R Glitho, H Elbiaze. (2021). Ensuring Energy Efficiency When Dynamically Assigning Tasks in Virtualized Wireless Sensor Networks,. IEEE Transactions on Green Networking and Communications (TGNC) (CiteScore: 8.4). Early access
Published
Refereed?: Yes, Open Access?: No
17. S. Kianpisheh and R. Glitho. (2021). Joint Admission Control and Resource Allocation with Parallel VNF Processing for Time-Constrained Chains of Virtual Network Functions. IEEE Access (Impact Factor 2020: 3.367). Early Access
Published
Refereed?: Yes, Open Access?: Yes
18. C. Mouradian, F. Ebrahimnezhad, Y. Jebbar, J. Ahluwalia, N.S Afrasiabi, R. Glitho, A. Moghe. (2020). An IoT Platform-as-a-Service for NFV Based –Hybrid Cloud / Fog Systems. IEEE Internet of Things (IoT) Journal (Impact Factor 2020: 9.471). 7(7): 6102 - 6115.
Published
Refereed?: Yes, Open Access?: No
19. N Promwongsa, M Abu-Lebdeh, S Kianpisheh, F. Belqasmi, R. Glitho, H Elbiaze, N Crespi, O Alfandi. (2020). Ensuring Reliability and Low Cost when using a Parallel VNF Processing to Embed Delay-Constrained Slices,. IEEE Transactions on Network and Service Management (TNSM) (Impact Factor 2020: 4.195). 17(4): 2226 - 2241.
Published
Refereed?: Yes, Open Access?: No
20. S. Malek Taji, A. Ebrahimzadeh, H. Elbiaze, R. Glitho, S. Kianpisheh,. (2020). An Optimization Framework for Content Migration in Edge-based Content Delivery Networks: A Deep Reinforcement Learning Approach. IEEE Transactions on Network and Service Management (TNSM) (Impact Factor 2020: 4.195). 18(3)
Published
Refereed?: Yes, Open Access?: No

21. M. Dieye, W Jaafar, H Elbiaze, R Glitho. (2020). MarketDriven Multi-domain Network Service Orchestration in 5G Networks. *EEE Journal on Selected Areas in Communications (JSAC)* (Impact Factor 2020: 9.144). 38(7): 1417 - 1431.
Published
Refereed?: Yes, Open Access?: No
22. F. Boabang; A. Ebrahimzadeh, R. Glitho, H. Elbiaze, M. Maier, F Belqasmi. (2020). Machine Learning Framework for Handling Delayed/Lost Packets in Tactile Internet Remote Robotic Surgery,. *EEE Transactions on Network and Service Management (TNSM)* (Impact Factor 2020: 4.195). Early Access
Published
Refereed?: Yes, Open Access?: No
23. C Mouradian, S Kianpisheh, M Abu-Lebdeh, F Ebrahimnezhad, N T Jahromi, R Glitho. (2019). Application Component Placement in NFV-based Hybrid Cloud/Fog Systems with Mobile Fog Nodes. *IEEE Journal on Selected Areas in Communications (JSAC)* (Impact Factor: 9.144). 37(5): 1130 – 1143.
Published
Refereed?: Yes, Open Access?: No
24. A. Soltanian, D Naboulsi, R Glitho, H Elbiaze. (2019). Resource Allocation Mechanism for Media Handling Services in Multimedia Conferencing,. *IEEE Journal on Selected Areas in Communications (JSAC)* (Impact Factor 2020: 9.144). 37(5): 1167 – 1181.
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Refereed?: Yes, Open Access?: No
25. MA Salahuddin, J Sahoo, R Glitho, H Elbiaze, W Ajib,. (2018). A Survey on Content Placement Algorithms for Cloud – Based Content Delivery Network. *IEEE Access* (Impact Factor 2020: 3.367). 6: 91 - 114.
Published
Refereed?: Yes, Open Access?: Yes
26. C Mouradian, D Naboulsi, S Yangui, R Glitho, M J Morrow, P A Polakos. (2018). A Comprehensive Survey on Fog Computing: State-of-the-art and Research Challenges. *IEEE Communications Surveys and Tutorials* (Impact Factor 2020: 25.249). 20(1): 416 - 464.
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Refereed?: Yes, Open Access?: Yes
27. C. Mouradian, N. Tahghigh, R. Glitho. (2018). NFV and SDN based – Distributed IoT Gateway for Large-Scale Disaster Management,. *IEEE Internet of Things (IoT) Journal* (Impact Factor 2020: 9.471). 5(5): pp 4119-4131.
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Refereed?: No, Open Access?: No
28. M. Dieye, S. Ahvar, J Sahoo, E Ahvar, R Glitho, H. Elbiaze, N. Crespi. (2018). CPVNF: Cost-efficient Proactive VNF Placement and Chaining for Value-Added Services in Content Delivery Networks. *IEEE Transactions on Network and Services Management (TNSM)* (Impact Factor 2020: 4.195). 15(2): pp 774-786.
Published
Refereed?: Yes, Open Access?: No
29. A Soltanian; F Belqasmi; S Yangui; M A. Salahuddin; R Glitho; H Elbiaze. (2018). A Cloud-based Architecture for Multimedia Conferencing Service Provisioning. *IEEE Access* ((Impact Factor 2020: 3.367). 6: 9792 - 9806.
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Refereed?: Yes, Open Access?: Yes
30. M. Abu-Lebdeh, D. Naboulsi, R. Glitho and C, T Wette. (2017). On the Placement of VNF Managers in Large- Scale and Distributed NFV Systems,. *IEEE Transactions on Network and Service Management (TNSM)* (Impact Factor 2020: 4.195). 14(4): 875-889.
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31. J Sahoo, M A Salahuddin, R Glitho, H Elbize, W Ajib. (2017). A Survey on Replica Server Placement Algorithms for Content Delivery Networks. IEEE Communications Surveys and Tutorials (Impact Factor in 2019: 25.249). 19(2): 1002-1026.
Published
Refereed?: Yes, Open Access?: No

Conference Publications

1. M Raeiszadeh, A Saleem, A Ebrahimzadeh, R Glitho, J Eker, R Mini. (2023). A Deep Learning Approach for Real-Time Application-Level Anomaly Detection in IoT Data Streaming. IEEE 19th Annual Consumer Communications & Networking Conference (CCNC), Las Vegas, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
2. M Saqib; H Elbiaze; R Glitho,. (2023). A Profit-aware Adaptive Approach for In-Network Traffic Classification. IEEE International Conference on Communications (ICC), Rome, Italy
Conference Date: 2023/5
Paper
Published
Refereed?: Yes, Invited?: No
3. B Shayesteh; C Fu; A Ebrahimzadeh and R Glitho. (2023). Causal-Temporal Analysis-based Feature Selection for Predicting Application Performance Degradation in Edge Clouds. IEEE International Conference on Communications (ICC), Italy
Conference Date: 2023/5
Paper
Accepted
Refereed?: Yes, Invited?: No
4. A Saleem, M Raeiszadeh, A Ebrahimzadeh, R Glitho. (2023). A Deep Learning Approach for Root Cause Analysis of Application Anomalies for Real-Time IIoT. Network Operations and Management Symposium (NOMS), Miami, United States of America
Conference Date: 2023/4
Paper
Published
Refereed?: Yes, Invited?: No
5. M Hammami, C Chaieb, W Ajib, H Elbiaze, R Glitho,. (2023). UAV-Assisted Wireless Networks for Stringent Applications: Resource Allocation and Positioning. IEEE Wireless Communications and Networking Conference (WCNC), Glasgow, United Kingdom
Conference Date: 2023/3
Paper
Published
Refereed?: Yes, Invited?: No
6. H Sedighi, D Gehberger and R Glitho. (2022). Workload-aware Dynamic GPU Resource Management in Component-based Applications. 10th IEEE International Conference on Cloud Engineering (IC2E), Pacific Grove, United States of America
Paper
Published
Refereed?: Yes, Invited?: No

7. Soukaina Ouledsidi Ali, Halima Elbiaze, Roch Glitho, Wessam Ajib,. (2022). CaMP-INC: Components-aware Microservices Placement for In-Network Computing Cloud-Edge Continuum. IEEE Globecom, Rio de Janeiro, Brazil
Conference Date: 2022/12
Paper
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Refereed?: Yes, Invited?: Yes
8. Aya Ahmed, Cirine Chaieb, Wessam Ajib, Halima Elbiaze and Roch Glitho. (2022). Resource Allocation and UAVs Placement in Cell-free Wireless Networks. IEEE Globecom, Brazil
Conference Date: 2022/12
Paper
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Refereed?: Yes, Invited?: No
9. Muhammad Saqib, Zakaria Ait Hmitti, Halima Elbiaze. (2022). An Accurate & Efficient Approach for Traffic Classification Inside Programmable Data Plane,. IEEE Globecom 2022, Rio de Janeiro, Brazil
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Paper
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10. Muhammad Saqib, Zakaria Ait Hmitti, Halima Elbiaze*, Roch H. Glitho,. (2022). An Accurate & Efficient Approach for Traffic Classification Inside Programmable Data Plane,. IEEE Globecom, Brazil
Conference Date: 2022/12
Paper
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Refereed?: Yes, Invited?: No
11. Soukaina Ouledsidi Ali, Halima Elbiaze, Roch Glitho, Wessam Ajib. (2022). CaMP-INC: Components-aware Microservices Placement for In-Network Computing Cloud-Edge Continuum. IEEE Globecom,, Rio de Janeiro, Brazil
Conference Date: 2022/12
Paper
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Refereed?: Yes, Invited?: No
12. Aya Ahmed, Cirine Chaieb, Wessam Ajib, Halima Elbiaze and Roch Glitho,. (2022). Resource Allocation and UAVs Placement in Cell-free Wireless Networks. IEEE Globecom,, Brazil,
Conference Date: 2022/12
Paper
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Refereed?: Yes, Invited?: No
13. A Hentati, A Ebrahimzadeh, RH Glitho, F Belqasmi, R Mizouni. (2022). Remote Robotic Surgery: Joint Placement and Scheduling of VNF-FGs. 18th International Conference on Network and Service Management (CNSM), Thessaloniki, Greece
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Paper
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Refereed?: Yes, Invited?: No

14. Razieh Abbasi Ghalehtaki, Amin Ebrahimzadeh, Roch H Glitho,. (2022). Context-Aware Feature Selection using Denoising Auto-Encoder for Fault Detection in Cloud Environments. IEEE Cloud Summit, Wshington, United States of America
Conference Date: 2022/6
Paper
Published
Refereed?: Yes, Invited?: No
15. JK Ahluwalia, C Mouradian, MN Alam, R Glitho,. (2022). Cloud Infrastructure as a Service for an Efficient Usage of Sensing and Actuation Capabilities in Internet of Things. IEEE/IFIP Network Operations and Management Symposium (NOMS), Hungary
Conference Date: 2022/4
Paper
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Refereed?: Yes, Invited?: No
16. RA Ghalehtaki, A Ebrahimzadeh, F Wuhib, RH Glitho,. (2022). An Unsupervised Machine Learning-based Method for Detection and Explanation of Anomalies in Cloud Environments,. 25th Conference on Innovation in Clouds, Internet and Networks (ICIN), France
Conference Date: 2022/3
Paper
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Refereed?: Yes, Invited?: No
17. VM Raee, A Ebrahimzadeh, M Rayani, R H. Glitho, M El Barachi, F Belqasmi,. (2022). Energy Efficient Virtual Network Embedding in Virtualized Wireless Sensor Networks,. IEEE 19th Annual Consumer Communications & Networking Conference (CCNC), Virtual, United States of America
Conference Date: 2022/1
Paper
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Refereed?: Yes, Invited?: No
18. A Ebrahimzadeh, M Maier, R Glitho. (2021). Trace-Driven Haptic Traffic Characterization for Tactile Internet Performance Evaluation. 7th International Conference on Engineering and Emerging Technologies,, Istanbul, Turkey
Conference Date: 2021/11
Paper
Published
Refereed?: Yes, Invited?: No
19. A Ebrahimzadeh, N Promwongsa, S N Afrasiabi, C Mouradian, W Li, A Recse, R Szabo and R Glitho. (2021). h-Horizon Sequential Look-ahead Greedy Algorithm for VNF-FG Embedding. 2021 IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN), Heraklion, Greece
Conference Date: 2021/11
Paper
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Refereed?: Yes, Invited?: No
20. B Shayesteth, A Ebrahimzadeh, C Fu, R Glitho. (2021). Auto-adaptive Fault Prediction System for Edge Cloud Environments in the Presence of Concept Drift. 9th IEEE International Conference on Cloud Engineering (IC2E), San Francisco, United States of America
Conference Date: 2021/10
Paper
Published
Refereed?: Yes, Invited?: No

21. F Rasouli, A Ebrahimzadeh, S Kianpisheh, N Promwongsa, F Belqasmi, R, Glitho. (2021). PredictiveFramework for Haptic Enabled VR-based Remote Phobia Treatment in Cloud/FogEnvironment (Special Mention Award). 2021 24th Conference on Innovation in Clouds, Internet and Networks and Workshops (ICIN), Paris, France
Conference Date: 2021/3
Paper
Published
Refereed?: Yes, Invited?: No
22. M Rayani, R Glitho, E Elbiaze. (2020). ETSI Multi-Access Edge Computing for Dynamic Adaptive Streaming inInformation Centric Networks,. IEEE Global Communications Conference (Globecom),, Taipei, Taiwan
Conference Date: 2020/12
Paper
Published
Refereed?: Yes, Invited?: No
23. F Boabang, R Glitho, H. Elbiaze, F Belqasmi, O. Alfandi,. (2020). A Framework forPredicting Haptic Feedback in Needle Insertion in Remote Robotic Surgery. The 17th Annual IEEE Consumer Communications & Networking Conference (CCNC 2020), Las Vegas, United States of America
Conference Date: 2020/1
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Refereed?: Yes, Invited?: No
24. P Rezende, S Kianpisheh, R Glitho, E Madeira,. (2019). An SDN Based Framework for RoutingMulti-Streams Transport Traffic Over Multi Multipath Networks,. IEEE International Conference on Communications (ICC), NGNI Symposium, May 2019, Shanghai, China
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
25. R A Ghalehtaki, S Kiampiesh and R Glitho. (2019). A Bee Colony Based Algorithm forMicro Cache Placement Close to End Users in Fog Based Content DeliveryNetworks,. The 16th Annual IEEE Consumer Communications & Networking Conference (CCNC 2019), Las Vegas, United States of America
Conference Date: 2019/1
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Refereed?: Yes, Invited?: No
26. S kiampisheh, and R Glitho. (2019). Cost Efficient Server Provisioning for Deadline – Constrained VNFChains: A Parallel VNF Processing Approach. The 16th Annual IEEE Consumer Communications & Networking Conference (CCNC 2019), Las Vegas, United States of America
Conference Date: 2019/1
Paper
Published
Refereed?: Yes, Invited?: No
27. S Malektaji, D Naboulsi, R Glitho, A Polyantsev, A E Essaili, C Iskander and R Brunner,. (2019). Video Sessions KPIs ClusteringFrameworks in CDNs. The 16th Annual IEEE Consumer Communications & Networking Conference (CCNC 2019), Las Vegas, United States of America
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Paper
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Refereed?: Yes, Invited?: No

28. SN Afrasiabi, S Kianpisheh, C Mouradian, RH Glitho,. (2019). Application Components Migration in NFV-based Hybrid Cloud/FogSystems. IEEE International Symposium on Local and Metropolitan Area Networks (LANMAN), Paris, France
Conference Date: 2018/7
Paper
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Refereed?: Yes, Invited?: No
29. Y. Jebbar, F. Belqasmi, R. Glitho, O. Alfandi. (2018). A Fog Based – Architecture forRemote Phobia Treatment. The 11th IEEE International Conference on Cloud Computing Technology and Science (IEEE CloudCom),, Sydney, Australia
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No
30. N. Alam and R. Glitho. (2018). An Infrastructure as a Service for the Internet of Things. IEEE CloudNet 2018,, Tokyo, Japan
Conference Date: 2018/11
Paper
Published
Refereed?: Yes, Invited?: No
31. S. Malektaji, S. Kianpieheh and R Glitho. (2018). Purging AwareContent Placement in Fog Based – Content Delivery Networks,. IEEE CloudNet 2018, Tokyo, Japan
Conference Date: 2018/10
Poster
Published
Refereed?: Yes, Invited?: No
32. M. Rayani, D. Naboulsi, R. Glitho. (2018). SlicingVirtualized EPC-based 5G Core Network for Content Delivery. IEEE International Symposium on Computer Communications (ISCC), Natal, Brazil
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
33. S Ahvar, J Sahoo, E Ahvar, M Dieye, R Glitho, H Elbiaze, N Crespi. (2018). PCPV:Pattern-based Cost-efficient Proactive VNF Placement and Chaining for Value-Added Services in Content Delivery Networks,. IEEE Netsoft, Montreal, Canada
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
34. N. Jahromi, S. Kianpisheh, R. Glitho,. (2018). OnlineVNF Placement and Chaining for Value added Services in Content DeliveryNetworks. IEEE LANMAN, Washington, United States of America
Conference Date: 2018/6
Paper
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Refereed?: Yes, Invited?: No

35. C. Mouradian, S. Kianpisheh, R. Glitho,. (2018). Application Component Placement in NFV-based Hybrid Cloud/Fog Systems,. IEEE LANMAN 2018, United States of America
Conference Date: 2018/6
Paper
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Refereed?: Yes, Invited?: No
36. S Ahvar, M Mirzaei, J Leguay, E Ahvar, A Medhat, N Crespi, R Glitho. (2018). a Simple and Effective Technique to improve costefficiency of VNF Placement and Chaining Algorithms for Network ServiceProvisioning. IEEE Netsoft, Montreal, Canada
Conference Date: 2018/6
Paper
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Refereed?: Yes, Invited?: No
37. V M Raee, D Naboulsi, R Glitho. (2018). EnergyEfficient Task Assignment in Virtualized Wireless Sensor Networks,. IEEE International Symposium on Computer Communications (ISCC) 2018, Natal, Brazil
Conference Date: 2018/6
Paper
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Refereed?: Yes, Invited?: No
38. M Aloui, S Yangui, H Elbiaze, R Glitho,. (2018). Analytics as aService Architecture for Cloud-based CDN: Case of Video Popularity Prediction. The 15th Annual IEEE Consumer Communications & Networking Conference (CCNC 2018), Las Vegas, United States of America
Conference Date: 2018/1
Paper
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Refereed?: Yes, Invited?: No
39. C Mouradian, S Yangui, R Glitho. (2018). Robotsas-a-Service in Cloud Computing: Search and Rescue in Large-scale DisastersCase Study,. The 15th Annual IEEE Consumer Communications & Networking Conference (CCNC 2018), Las Vegas, United States of America
Conference Date: 2018/1
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Refereed?: Yes, Invited?: No
40. N Taghigh;; R Glitho; A Larabi, R Brunner,. (2018). An NFV and MicroservicesBased Architecture for On-the-Fly Component Provisioning in Content DeliveryNetworks. The 15th Annual IEEE Consumer Communications & Networking Conference (CCNC 2018), Las Vegas, United States of America
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Paper
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Refereed?: Yes, Invited?: No
41. A Soltanian, D Naboulsi; M A Salahuddin, R Glitho; H Elbiaze;. (2018). ADS: Adaptive and Dynamic Scaling Mechanism forMultimedia Conferencing Services in the Cloud. The 15th Annual IEEE Consumer Communications & Networking Conference (CCNC 2018), Las Vegas, United States of America
Conference Date: 2018/1
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Refereed?: Yes, Invited?: No

42. M. Salahuddin, A. Mseddi, H. Elbiaze, R. Glitho. (2017). Popularity and Correlation-aware Content Placement for Hierarchical Surrogates in cloud based – CDNs,. Technical Symposium on Communications Software, Services and Multimedia Applications, Globecom, Singapore, Singapore
Conference Date: 2017/12
Paper
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Refereed?: Yes, Invited?: No
43. M. Abu-Lebdeh, D. Naboulsi, R. Glitho, CW Tchouati. (2017). NFV orchestrator placement for geo-distributed systems,. 16th IEEE International Symposium on Network Computing and Applications (NCA 2017),, Cambridge, United States of America
Conference Date: 2017/11
Paper
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Refereed?: Yes, Invited?: No
44. S Ahvar, H P Phyu, S M Buddhacharya, E Ahvar, R Glitho, N Crespi. (2017). CCVP: Cost efficient Centrality-based VNF Placement and Chaining Algorithm for Network Service Provisioning. 3rd IEEE Conference on Network Softwarization (NetSoft 2017),, Bologna, Italy
Conference Date: 2017/7
Paper
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Refereed?: Yes, Invited?: No
45. C Mouradian, J Sahoo, RH Glitho, MJ Morrow, PA Polakos. (2017). A Coalition Formation Algorithm for Multi-Robot Task Allocation in Large-Scale Natural Disasters. 13th IWCMC 2017 Conference, Valence, Spain
Conference Date: 2017/6
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Published
Refereed?: Yes, Invited?: No
46. N Taghig; S Yangui; A Larabi; D Smith; M A Salahuddin; R Glitho; R Brunner; H Elbiaze. (2017). NFV and SDN-based Cost-efficient and Agile Value-added Video Services Provisioning in Content Delivery Networks. The 14th Annual IEEE Consumer Communications & Networking Conference (CCNC 2017), Las Vegas, United States of America
Conference Date: 2017/1
Paper
Published
Refereed?: Yes, Invited?: No
47. Narjes Taghig Jahromi; Sami Yangui; Adel Larabi; Daniel Smith; Mohammad Ali Salahuddin; Roch Glitho; Richard Brunner; Halima Elbiaze,. (2017). NFV and SDN-based Cost-efficient and Agile Value added Video Services Provisioning in Content Delivery Networks. IEEE CCNC, Las Vegas, US, January 2017, Las Vegas,
Conference Date: 2017/1
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Patents

1. Orchestrator for a Virtual Platform as a Service (VNPAAS). United States of America.
Patent Status: Granted/Issued
Year Issued: 2021
Inventors: M Abu Lebdeh, R Glitho, C Tchouati
The disclosure relates to an orchestrator, for a Virtual Network Platform as a Service (VNPaaS), which orchestrates the management of a Network Service (NS). The orchestrator is operative to select an orchestration zone for each of a plurality of Virtual Network Functions (VNFs) in the NS based on selected deployment locations, where each orchestration zone comprises at least one VNF. The orchestrator is operative to associate sub-services to the selected orchestration zones, the sub-services being obtained from a decomposition of the NS into a number of sub-services equal to a number of orchestration zones selected and each sub-service comprising at least one of the plurality of VNFs. The orchestrator is operative to initiate deployment of the sub-services in the selected orchestration zones.
2. Method for VNF managers placement in large-scale and distributed NFV systems. United States of America. 11032135. 2018/07/12.
Patent Status: Granted/Issued
Year Issued: 2021
Inventors: Mohammad Abu Lebdeh Diala Naboulsi Roch Glitho Constant Wette
There is provided a network node and method for placement of virtual network functions managers (VNFMs) in a network functions virtualization (NFV) system. The method comprises determining a number of VNFMs for the NFV system, determining a type for each VNFM, determining a placement for each VNFM over distributed Network Function Virtualization Infrastructure Points of Presence (NFVI-PoPs) and determining a plurality of associations between the VNFMs and VNF instances in the system, thereby generating a VNFMs placement solution.



FORM 100A
Personal Data Form
PART I

Date
2024/01/31
Personal identification no. (PIN)
Valid 278204

Family name Hammad	Given name Amin	Initial(s) of all given names A	Personal identification no. (PIN) Valid 278204
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I hold a faculty position at an eligible Canadian college (complete Appendices B1 and C)

I do not or will not hold an academic appointment at a Canadian postsecondary institution

Place of employment other than a Canadian postsecondary Institution (give address in Appendix A)

APPOINTMENT AT A POSTSECONDARY INSTITUTION

Title of position Professor	Tenured or tenure-track academic appointment <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Part-time appointment <input checked="" type="checkbox"/> Full-time appointment <ul style="list-style-type: none"> For all non-tenured or non tenure-track academic appointment and Emeritus Professors, complete Appendices B & C For life-time Emeritus Professor and part-time positions, complete Appendix C
Department Concordia Institute for Information Systems	
Campus Sir George Williams Campus	
Canadian postsecondary institution Concordia University	

Personal information collected on this form and appendices will be stored in the Personal Information Bank for the appropriate program.

Personal identification no. (PIN)

Valid 278204

Family name

Hammad

CURRENT EMPLOYMENT

Position held (begin with current)	Organization	Department	Period (yyyy/mm to yyyy/mm)
Professor	Concordia University	Concordia Institute for Information Systems Engineering (CIISE)	2003/09

1. Most Significant Contribution

I am an internationally recognized researcher in the field of developing innovative methods based on artificial intelligence and 3D/4D modelling and simulation to improve construction processes and the operation management of constructed facilities. My vision is to transform the Architecture, Engineering, Construction, and Facilities Management (AEC/FM) industry to fully embrace the benefits of new technologies to achieve safer, more efficient, and highly automated construction sites, and more efficient operation of smart facilities. My previous research has resulted in about 300 peer-reviewed papers in top-tier journals and conferences in my research area (5400 citations according to Google Scholar). Five of my most significant contributions from the last six years are listed below. The references are available in the Common CV.

(1) Advancements in sensor-based pose estimation and tracking of construction resources

My research team and I have developed several methods for pose estimation and tracking of construction equipment using Real-time Location Systems (RTLS). The purpose is to improve safety by timely detecting potential collisions on congested sites. These methods were tested on an actual construction site in Montreal. In addition, the tracking data are used to generate workspaces for earthwork equipment to detect risks based on proximity to obstacles and the speed of movement of different parts of the equipment [C22, J32]. Furthermore, we developed a new method for near real-time simulation of earthmoving projects based on equipment tracking information [C10]. One of the applicant's Ph.D. students trained in this area was hired immediately after graduation as Assistant Professor at Twente University and has been recently offered tenure.

(2) Innovative methods in Building Information Modelling (BIM) and Construction Digital Twins

Our research in this area includes: (1) Extending the usage of BIM to physical security applications. We developed a method to optimize the type, number, and location of fixed surveillance cameras in a building using BIM-based simulation and a metaheuristic optimization method. This method is further extended to consider the movement planning of Pan-Tilt-Zoom (PTZ) cameras [J9]. (2) We have developed a new guideline for systematically defining the Level of Development (LOD) of 4D simulation based on the specific purpose of the simulation [B3, C36, C39]. This research aims to fill the knowledge gap for linking the available LODs of 3D BIM models and schedules [C51, J24, J42, J44, J55]. For example, if safety issues are to be considered in the 4D simulation, then the highest 4D-LOD Should be considered [C33, C35]. (3) We developed a roadmap for the research needed to create digital twinning of construction projects [J7, C4]. We also developed the concept of the *Construction Digital Twin*, where workers, equipment, and materials are continuously tracked using sensors and computer vision, and the collected information is processed in near real-time to update the design model and the simulation of upcoming tasks and to provide navigation guidance and safety warnings in case of potential collisions. The objective of this research is to improve the productivity and safety of heavy construction projects by integrating 4D BIM models with the managerial and operational processes of heavy construction using multi-agent systems, real-time simulation, and automated machine control. The Ph.D. student trained in this area is currently working as a senior scheduler at Hydro-Quebec, and the research approach has been implemented in the simulation of several major power plant construction projects. Another Ph.D. student trained in this area is currently working as tenure-track Associate Professor at King AbdulAziz University in Saudi Arabia.

(3) Enhancing the performance of simulation and optimization techniques

We have developed an innovative method to improve the performance of simulation-based Optimization using high-performance computing. The method has been tested in several case studies related to bridge construction projects [J56]. Furthermore, we extended this method by integrating variance reduction techniques and parallel computing [J47]. The developed model can reduce the computation time, improving the quality of optimal solutions, and increasing the confidence level in the optimality of the solutions. The model allows project planners to obtain superior optimal solutions faster, which will make the use of stochastic simulation optimization more appealing. We have also developed a method for considering the joint probability for evaluating the schedule and cost output of stochastic simulation models [J24]. This method allows for calculating the conditional probability of the project cost for a given project duration, and for finding the best project duration and cost that meet a specific joint probability. One of the applicant's Ph.D. students trained in this area is currently working as tenure-track Assistant Professor at Thomas Jefferson University.

(4) Innovative computer vision (CV) methods for construction projects

We developed several methods for detailed pose estimation of construction equipment by fusing data from stereo CV and GPS [J3]. One of the challenges in training deep learning methods is having large datasets of images. To solve this problem, we developed a method based on self-supervised methods. The benefit of these methods is that the time-consuming process of annotating the images can be automated. Furthermore, our collaborative research with a start-up company (Indus.AI) has resulted in several papers related to predicting the movements of onsite workers and equipment for enhancing safety. One of the applicant's Ph.D. students trained in this area is currently working as Senior Machine Learning Scientist at the same company, and more recently, as Senior Manager, Machine Learning at Procure. Another trained Ph.D. student became Assistant Professor, at Zhejiang University of Science and Technology. Specific contributions are: (1) Self-supervised contrastive video representation learning for construction equipment activity recognition on a limited dataset using contrastive video representation [J12]; (2) CNN-based simultaneous detection and activity classification of construction workers [J3]; (3) Automatic identification of idling reasons in excavation operations based on excavator-truck relationships [J31]; (4) Automated excavator activity recognition and productivity analysis from construction site surveillance videos [J40]; (5) Nested network for detecting personal protective equipment on large construction sites based on frame segmentation [C21]; (6) Framework for location data fusion and pose estimation of excavators using stereo vision [J54]; and (7) Skeleton estimation of excavator by detecting its parts [J61].

(5) Improving Infrastructure Lifecycle Management: Our work in this area focused on three areas. First, in municipal asset management, we developed a multi-objective framework for optimizing the maintenance plan of multiple municipal asset networks in an integrated way considering the deterioration models of different types of assets [J53, C9, C20]. Furthermore, in the planning, construction, and cost-sharing of multi-purpose utility tunnels as a smart, resilient, and sustainable solution [B4, J43]. Our contributions in this area include: (1) Street closure prediction based on the combined conditions of spatially collocated municipal Infrastructure assets at the segment level [C2, J6]; (2) Multi-criteria spatial analysis for location selection of multi-purpose utility tunnels [C24, J13, J27]; (3) Discrete event simulation of multi-purpose utility tunnels construction using microtunneling [C14]; (4) Framework for multi-purpose utility tunnel lifecycle cost assessment and cost-sharing [C48, J38],

and (5) Developing information model for multi-purpose utility tunnel lifecycle management [J4]. Another area of research is improving bridge lifecycle management by updating the Bridge Information Model using UAV-based LiDAR scanning and deep learning methods [B2, J14, J41, C8, C30, C37, C46, C56].

2. Additional Information on Contributions

Collaborations with other researchers. I have a multidisciplinary background and experience in collaboration and leading large team projects that bring together academia and industry for the development of high-quality research. My main affiliation is with Concordia Institute for Information Systems Engineering. I am also affiliated with the Department of Building, Civil and Environmental Engineering. I have university-wide collaboration with colleagues from different backgrounds in engineering, computer science, geography, urban planning, etc. My collaboration with other researchers is done through the co-supervision of graduate students when the subject of the research requires complementary expertise. In addition, I have several ongoing international collaborations in Japan, China, and Europe. For example, in 2016, I spent three months at Osaka University as Specially Appointed Professor collaborating with Prof. N. Yabuki.

2.1 Joint publications

In general, the students are listed first, and the order is based on the level of their contributions to the paper. In the case of co-supervision, the order of the co-supervisors is based on the level of their contribution to the supervision and the actual work reported in the paper. My name is last on the list of authors when I am the principal investigator of the project, reflecting my role as the supervisory authority. Almost all my publications are with my graduate students. My role in joint papers with students is to provide the initial idea behind the research and work with the students to develop the methods/algorithms/approaches to the level that they are publishable.

2.2 Selecting venues for publications

The selection of journals for publications is mainly based on the research area to reach the specific target audience and the impact factor (IF) of the journal. For example, the Journal of Automation in Construction (IF: 10.517), Advanced Engineering Informatics (IF: 7.862), Journal of Expert Systems with Applications (IF: 8.665), Tunnelling and Underground Space Technology (IF: 6.9), and ASCE Journal of Computing in Civil Engineering (IF: 5.802) are the best journals in my research area. Advanced Engineering Informatics is not limited to the area of civil engineering and construction and may have an impact on other engineering areas as well. As for the conferences, my papers are submitted to the most important conferences in my area of research, such as the IEEE Winter Simulation Conference, the Int. Conference on Computing in Civil and Building Engineering, the Construction Research Congress, and the Int. Symposium on Automation and Robotics in Construction (I am a member of the Board of Directors). I have been a member of the scientific committees of all these conferences for several years.

3. Past Contributions to HQP Training

3.1 Training environment

My training environment provides students with access to state-of-the-art hardware devices (e.g., 10 GPU high-performance computing, professional drones; wireless sensors and IoT devices; infrared, PTZ, and spherical cameras; real-time location tracking systems; 3D scanners) and software tools (e.g., simulation, optimization). They also have the unique opportunity to work closely with public and private organizations including the City of Montreal, construction owners (e.g., Hydro-Quebec), general constructors (e.g., Pomerleau), and IT and AI solution providers (e.g., Rival Solutions). This interdisciplinary, collaborative environment is a key contributor to their success in academia by using their experiences to develop new research programs, or in industry by using the skills and contacts gained from their study period to excel in their work.

3.2 HQP awards and research contributions

Over the last six years, almost all my journal and conference papers have been derived from the work of my students as first authors. Furthermore, many of my HQPs have received international (e.g., Libyan and Saudi Government Scholarships), national (e.g., the prestigious Alexander Graham Bell Canada Graduate Scholarship), provincial (e.g., Fonds de recherche du Québec–Nature et Technologies Scholarship), university-level (e.g., Concordia Entrance Fellowship) and private organization (e.g., University Foundation Pierre Arbour Scholarship) awards in recognition of their skills and contributions to the academic community. One of these students has also received Foreign Study Supplement from NSERC to spend one term at Harvard University as an exchange researcher.

Some of the awards obtained by my students are: (1) *CSCE Construction Division Moselhi Best Paper Award, 2023* (Malcolm Dunson-Todd), (2) *AACEI 3+1 Construction Elevator Pitch Competition - 2nd Place Award* (Malcolm Dunson-Todd), (3) *Second place in Construction 2050: Ideas for Future* from Construction Innovation Centre (CIC), University of Alberta, 2022 (Ali Ghelmani and Yusheng Huang), (4) *Best Paper Award in 2022, ASCE Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, (Dr. Michel Guévremont), (5) *Best Scholarly Paper/Feature/Case Study Award in 2021, ASCE Journal of Legal Affairs and Dispute Resolution in Engineering and Construction* (Dr. Michel Guévremont), (6) *First place in Prix Relève* from Centre d'expertise et de recherche en infrastructures urbaines (CERIU), 2021 (Dr. Genger Tersoo), (7) *First place in Prix Relève* from CERIU, 2019 (Yisha Luo).


4. Outcomes and skills gained by HQP

In the last 6 years, I have supervised 16 PhD and 13 MASc students. Many of them became successful faculty members. For example, Dr. Cheng Zhang is Assoc. Prof. at Xi'an Jiaotong-Liverpool University, Dr. Ali Motamedi is Full Professor at École de Technologie Supérieure, Dr. Farid Vahdatikhaki is Tenured Assistant Professor at Twente University, the Netherlands, Dr. Mohammad Mawlana is Assistant Professor at Thomas Jefferson University, and Dr. Chen Chen is Assistant Professor, Zhejiang University of Science and Technology. Others are working in industry and research in parallel. For example, Dr. Shide Salimi is Research Fellow at Harvard University, Dr. Michel Guévremont is Senior Lead Engineer at Hydro Québec, and Dr. Mohammad Soltani is Senior Manager of Machine Learning at Procore.

**APPENDIX A
Personal Data
(Form 100A)**

Complete this appendix (i) if you are an applicant or co-applicant applying for the first time; (ii) if you need to update information submitted with a previous application; or (iii) if you do not hold an appointment at a Canadian postsecondary institution. For updates, include only the revised information in addition to the date, your name and your PIN.

This information will be used by NSERC primarily to contact applicants and award holders. It may also be used to identify prospective reviewers and committee members, and to generate statistics. It will not be seen or used in the adjudication process.

			Date 2024/01/31
Family name Hammad	Given name Amin	Initial(s) of all given names A	Personal identification no. (PIN) Valid 278204
Position and complete mailing address if your primary place of employment is not a Canadian postsecondary institution or if your current mailing address is temporary			If address is temporary, indicate: Starting date Leaving date
Telephone number 1 (514) 8482424 5800	Facsimile number	E-mail address amin.hammad@concordia.ca	
Telephone number (alternate)	 Give an alternate telephone number only if you can be reached at that number during business hours.		
LANGUAGE CAPABILITY			
English	Read <input checked="" type="checkbox"/>	Write <input checked="" type="checkbox"/>	Speak <input checked="" type="checkbox"/>
French	Read <input checked="" type="checkbox"/>	Write <input checked="" type="checkbox"/>	Speak <input checked="" type="checkbox"/>
I wish to receive my correspondence:		in English <input checked="" type="checkbox"/>	in French <input type="checkbox"/>
AREA(S) OF EXPERTISE			
Provide a maximum of 10 key words that describe your area(s) of expertise. Use commas to separate them. If you have expertise with particular instruments and techniques, specify which one(s). Automation in Construction, Construction Management, Health and Safety, Applied Artificial Intelligence, Virtual and Augmented Reality, Infrastructure Management, Decision Support Systems, Digital Twins, Building Information Modeling, Modeling and Simulation			Research subject code(s) Primary 1001
			Secondary 2710

Date Submitted: 2023-09-06 00:14:49

Confirmation Number: 1646845

Template: NSERC_Researcher

Professor Amin Hammad

Correspondence language: English

Contact Information

The primary information is denoted by (*)

Address

Courier

Concordia Institute for Information
Engineering (CIISE),
Concordia University
1515 Ste-Catherine Street West, EV7.634
Montréal, Québec Quebec H3G 2W1
Canada

Primary Affiliation (*)

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Engineering (CIISE),
Concordia University
1515 Ste-Catherine Street West, EV7.634
Montréal, Québec Quebec H3G 2W1
Canada

Telephone

Fax	514-8483171
Work (*)	514-8482424 extension: 5800

Email

Work (*)	amin.hammad@concordia.ca
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Protected when completed

Professor Amin Hammad

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
Arabic	Yes	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes
Japanese	Yes	Yes	Yes	Yes	Yes

Degrees

- 1993/3 Doctorate, Civil Engineering (Computer-Aided Engineering), Nagoya University
- 1990/3 Master's Thesis, Civil Engineering, Nagoya University
- 1986/9 Bachelor's, Civil Engineering, Damascus University

Recognitions

- 2022/8 Invited Speaker at the conference "Transforming Construction with Reality Capture Technologies"
University of New Brunswick
Honor
This CSCE-sponsored conference was held in August, 2022 at University of New Brunswick
- 2018/5 Co-chair of the 7th CSCE Construction Specialty Conference jointly held with the Construction Research Congress (CRC 2019)
CSCE
Honor
The role is given by the Construction Division of the Canadian Society of Civil Engineers (CSCE)

User Profile

Research Specialization Keywords: Applied geomatics in infrastructure modeling, Building Information Modeling, Computer vision for construction safety, Construction Management, Construction Robotics, Infrastructure Management, Location-based computing, Optimizing construction resources, Simulation of construction processes, Virtual and Augmented Reality

Employment

2011/6	Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Consultation, Professor Tenure Status: Tenure
2016/7 - 2016/8	Specially Appointed Professor Division of Sustainable Energy and Environmental Engineering, Graduate School of Engineering, Osaka University Full-time, Professor Tenure Status: Non Tenure Track
2003/9 - 2011/5	Associate Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Term, Associate Professor Tenure Status: Tenure
2003/5 - 2003/8	Visiting Associate Professor Center for Spatial Information Science, Tokyo University Full-time, Term, Associate Professor Tenure Status: Non Tenure Track Research and teaching activities.
2001/6 - 2003/4	Visiting Assistant Professor Information Science and Telecommunications, University of Pittsburgh Part-time, Visiting Professorship, Assistant Professor Tenure Status: Non Tenure Track Research and teaching activities.
2001/6 - 2003/4	Visiting Scholar Civil Engineering, Carnegie-Mellon University Part-time, Term, Assistant Professor Tenure Status: Non Tenure Track Research activities.
2001/3 - 2001/5	Visiting Scholar Civil Engineering, University of Toronto Full-time, Visiting Professorship, Assistant Professor Tenure Status: Non Tenure Track Research activities.
1999/6 - 2001/2	Lecturer (rank between Assistant Professor and Associate Professor) Civil Engineering, Nagoya University Full-time, Term, Lecturer Tenure Status: Tenure Track
1997/4 - 1999/5	Principal Researcher Transportation and Urban Planning, Nagoya Industrial Science Research Institute
1993/4 - 1997/3	Assistant Professor Civil Engineering, Nagoya University Full-time, Term, Assistant Professor Tenure Status: Tenure Track
1981/1 - 1985/12	Site Engineer (part-time job for a total of 12 months) Kasiun Construction, Inc.

Research Funding History

Awarded [n=2]

2019/5 - 2025/4
Principal Investigator Cyber-Physical System Approach for Improving Productivity and Safety of Construction Projects, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery Grant
Total Funding - 310,000
Portion of Funding Received - 310,000
Funding Competitive?: Yes

2023/8 - 2024/5
Principal Applicant Developing Standard Test for Evaluating Back-Support Exoskeleton Performance for Rebar Workers, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 30,000
Portion of Funding Received - 30,000
Funding Competitive?: Yes
Co-applicant : Mazdak Nik-Bakht

Completed [n=11]

2020/2 - 2020/12
Principal Investigator Using RTLS and Computer Vision to Extend Worksite Safety, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 108,666
Portion of Funding Received - 108,666
Funding Competitive?: Yes

2018/9 - 2020/10
Principal Investigator Identification of potential areas and associated benefits of Multi-purpose Utility Tunnel (MUT) on the territory of the city Montreal, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 120,000
Portion of Funding Received - 120,000
Funding Competitive?: Yes

2018/1 - 2020/9
Co-investigator Advanced system for Heightened Situational Awareness and Risk Management in Construction Projects, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
CRD
Total Funding - 234,000
Portion of Funding Received - 100,000
Funding Competitive?: Yes
Principal Applicant : Jia Yuan Yu

2017/5 - 2019/4
Principal Applicant Faculty Research Fund for Supporting Graduate Students, Grant

Funding Sources:

Concordia University
 Faculty Research Fund
 Total Funding - 124,000
 Portion of Funding Received - 124,000
 Funding Competitive?: No

2014/4 - 2019/3
 Principal Applicant
 Improving Productivity and Safety of Highway Construction Projects Using Near Real-Time Simulation, Grant

Funding Sources:
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 Discovery Grants Program
 Total Funding - 125,000
 Portion of Funding Received - 125,000
 Funding Competitive?: Yes

2018/3 - 2019/3
 Principal Applicant
 Aerial Inspection of Bridges and Power Industry Assets Using LiDAR Mounted on Autonomous Multi-Rotor UAV, Grant

Funding Sources:
 Concordia University
 Team Accelerator
 Total Funding - 40,000
 Portion of Funding Received - 40,000
 Funding Competitive?: Yes

Co-applicant : Ashutosh Bagchi; Zhenhua Zhu

2017/1 - 2018/12
 Co-applicant
 Video-Based Fall Detection for Construction Workers Safety, Grant

Funding Sources:
 Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 90,000
 Portion of Funding Received - 45,000
 Funding Competitive?: Yes

Principal Investigator : Zhenhua Zhu

2018/1 - 2018/12
 Co-applicant
 Developing a Wireless Sensor-Based On-Site Structural Health Monitoring Platform for Buildings and Infrastructure, Grant

Funding Sources:
 Concordia University
 VPRGS - Facilities Optimization
 Total Funding - 20,000
 Portion of Funding Received - 5,000
 Funding Competitive?: Yes

Co-applicant : Zhenhua Zhu;

Principal Applicant : Ashutosh Bagchi

2018/3 - 2018/9
 Co-applicant
 Software Tools and Equipment for Modeling, Simulation and Analysis of Industrial IoT Systems, Grant

Funding Sources:
 Concordia University
 ENCS Capital Research Innovation Fund
 Total Funding - 98,581
 Portion of Funding Received - 10,000
 Funding Competitive?: Yes

Co-applicant : Abdesamad Ben Hamza; Akshay Rathore; Andrea Schiffauerova; Chun Wang; Ciprian Alecsandru; Feresteh Mafakheri; Jamal Bentahar; Jia Yuan Yu; Nadia Bhuiyan; Nizar Bouguila; Pragsen Pillay; Yong Zeng; Zhi Chen;

Principal Applicant : Anjali Awasthi

2018/3 - 2018/9

Principal Applicant

Development of Semantic BIM for Supporting UAV-Based Reality Capture for Facilities Management Applications, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Engage Program

Total Funding - 25,000

Portion of Funding Received - 25,000

Funding Competitive?: Yes

2017/4 - 2018/3

Principal Applicant

Aerial Inspection of Power Industry Assets using LiDAR and Cameras Mounted on Autonomous Multi-Rotor UAV, Grant

Funding Sources:

Concordia University

VPRGS - Seed

Total Funding - 20,000

Portion of Funding Received - 15,000

Funding Competitive?: Yes

Co-applicant : Ashutosh Bagchi; Zhenhua Zhu

Under Review [n=1]

2023/11 - 2024/6

Principal Applicant

Testing Occupational Exoskeleton Performance in Different Types of Construction Activities, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate Program

Total Funding - 30,000

Portion of Funding Received - 30,000

Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=13]

2023/5 - 2025/4

Principal Supervisor

Hosna Ghorab (In Progress) , Concordia University

Student Degree Expected Date: 2025/4

Thesis/Project Title: Reverse Supply Chain for Modular Construction (tentative)

Present Position: MSc student, Concordia University

2022/9 - 2024/8

Co-Supervisor

Dunson-Todd , Malcolm (In Progress) , Concordia University

Student Degree Expected Date: 2024/8

Thesis/Project Title: *Experimental Study on the Usage of Exoskeletons in Construction (tentative)*

Present Position: MSc student, Concordia University

- 2020/9 - 2023/8
Academic Advisor Jamali, Ali (Completed) , Concordia University
Thesis/Project Title: Pavement Defect Classification and Localization Using Hybrid Weakly Supervised and Supervised Deep Learning and GIS
Present Position: Data Scientist, Rival Solutions
- 2020/1 - 2022/5
Principal Supervisor Jorjam, Shayan (Completed) , Concordia University
Thesis/Project Title: *Stochastic Simulation of Construction Methods of Multi-purpose Utility Tunnels*
Present Position: Project Manager
- 2020/1 - 2022/3
Co-Supervisor Torabi, Ghazhaleh (Completed) , Concordia University
Thesis/Project Title: Productivity Monitoring of Construction Workers Based on Spatiotemporal Activity Recognition
Present Position: Junior Computer Vision Engineer, Leav
- 2018/9 - 2020/12
Co-Supervisor Mohammad Akbarzadeh (Completed) , Concordia University
Thesis/Project Title: Enhancing Safety on Construction Sites by Detecting Personal Protective Equipment and Localizing Workers Using Computer Vision Techniques
Present Position: Software Engineer at Stratuscent
- 2018/1 - 2019/12
Principal Supervisor Yisha Luo (Completed) , Concordia University
Thesis/Project Title: Multi-Criteria Spatial Analysis of Multi-Purpose Utility Tunnels
Present Position: Engineer
- 2017/9 - 2020/12
Co-Supervisor Huang, Yusheng (Completed) , Concordia University
Thesis/Project Title: Providing Proximity Alerts to Workers on Construction Sites Using Bluetooth Low Energy RTLS
Present Position: PhD student, Concordia University
- 2017/9 - 2019/12
Principal Supervisor Majid Nasrollahi (Completed) , Concordia University
Thesis/Project Title: Automated Bridge Inspection for Concrete Surface Defect Detection Using Deep Neural Network Based on LiDAR Scanning
Present Position: Computer Vision Engineer at AIRM Consulting
- 2017/5 - 2019/4
Principal Supervisor Roya Amrollahibuki (Completed) , Concordia University
Thesis/Project Title: Modeling Construction Equipment in 4D Simulation and Application in VR Safety Training
Present Position: Engineer
- 2017/1 - 2018/12
Co-Supervisor Roshanak Eftekhari (Completed) , Concordia University
Thesis/Project Title: Improving Fire Emergency Management Using Occupant Information and BIM-Based Simulation
Present Position: Project Manager
- 2017/1 - 2019/4
Principal Supervisor Karandish, Forough (Completed) , Concordia University
Thesis/Project Title: *Evaluating the Performance of Convolutional Neural Network for Classifying Equipment on Construction Sites*
Present Position: Computer Vision Research Engineer at Huawei, Canada
- 2015/5 - 2017/8
Principal Supervisor Liu, Zheng (Completed) , Concordia University
Thesis/Project Title: Simulation of Local Climate Control in Shared Offices Based on Occupants Locations and Preferences
Present Position: Technical Sales Specialist at CertainTeed Architectural Products

Doctorate [n=16]

2021/1 - 2024/12 Academic Advisor	Huang, Yusheng (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: <i>Improving Construction Safety and Productivity Using Digital Twins (tentative)</i> Present Position: PhD student, Concordia University
2020/9 - 2024/4 Academic Advisor	Ghelmani, Ali (In Progress) , Concordia University Student Degree Expected Date: 2024/4 Thesis/Project Title: Construction Productivity Estimation Using Computer Vision Based Deep Learning (tentative) Present Position: PhD student, Concordia University
2018/9 - 2023/4 Principal Supervisor	Tersoo Genger (Completed) , Concordia University Thesis/Project Title: Framework for Multi-Purpose Utility Tunnel Location Selection Considering Social Costs Present Position: PDF, Concordia University
2017/5 - 2022/8 Principal Supervisor	Fardin Bahreini (Completed) , Concordia University Thesis/Project Title: <i>Ontological and Machine Learning Approaches for Inspection of Facilities Using BIM</i> Present Position: Engineer
2017/1 - 2021/7 Principal Supervisor	Michel Guevremont (Completed) , Concordia University Thesis/Project Title: <i>4D Simulation of Capital Construction Projects: Levels of Development and Ontology for Delay Claims Applications</i> Present Position: Senior Lead Engineer - Scheduling and 4D simulation at Hydro Québec
2017/1 - 2021/2 Co-Supervisor	Chen Chen (Completed) , Concordia University Thesis/Project Title: Computer Vision Based Automated Monitoring and Analysis of Excavation Productivity on Construction Sites Present Position: Assistant Professor, Zhejiang University of Science and Technology
2016/5 - 2021/1 Co-Supervisor	Charles Nnaemeka Igwe (Completed) , Concordia University Thesis/Project Title: A Process-Based Approach for Integrating the Last Planner System In 4D Modeling for Equipment Workspace Planning in Elevated Urban Highway Projects Present Position: Section Head, Canadian Nuclear Laboratories
2016/1 - 2020/12 Principal Supervisor	Aghbandrad, Ali (Completed) , Concordia University Thesis/Project Title: <i>Economical Analysis and Information Modeling of Multi-purpose Utility Tunnels</i> Present Position: Full Stack Web Developer, Nectar Design
2015/5 - 2022/6 Principal Supervisor	Bolourian, Neshat (Completed) , Concordia University Thesis/Project Title: <i>Point Cloud-based Deep Learning and UAV Path Planning for Surface Defect Detection of Concrete Bridges</i> Present Position: Engineer
2015/5 - 2019/12 Principal Supervisor	Salimzadeh, Negar (Completed) , Concordia University Thesis/Project Title: <i>Optimization of PV Modules Layout on High-rise Building Skins Using a BIM-based Generative Design Approach</i> Present Position: Engineer
2015/1 - 2020/4 Principal Supervisor	Arani, Seyed Amirhosain Sharif (Completed) , Concordia University Thesis/Project Title: Optimizing Energy Performance of Building Renovation Using Traditional and Machine Learning Approaches Present Position: Co-Founder and CTO, ExtergyAI

- 2015/1 - 2019/12
Principal Supervisor Salimi, Shide (Completed) , Concordia University
Thesis/Project Title: Simulation-Based Optimization of Energy Consumption and Occupants Comfort in Open-Plan Office Buildings Using Probabilistic Occupancy Prediction Model
Present Position: Research Associate, Harvard University
- 2014/1 - 2021/3
Co-Supervisor Taher, Alhussein (Completed) , Concordia University
Thesis/Project Title: Computer Vision Based Automated Monitoring and Analysis of Excavation Productivity on Construction Sites
Present Position: Professor at Montreal College of Information Technology
- 2013/9 - 2017/9
Co-Supervisor Soltani, Mohammad (Completed) , Concordia University
Thesis/Project Title: *Excavator Pose Estimation for Safety Monitoring by Fusing Computer Vision and RTLS Data*
Present Position: Senior Manager, Machine Learning, Procore Technologies
- 2013/2 - 2017/1
Principal Supervisor Albahri, Ameen (Completed) , Concordia University
Thesis/Project Title: Simulation-Based Optimization for the Placement of Surveillance Cameras in Buildings Using BIM
Present Position: Assistant Professor, King Abdul-Aziz University
- 2013/1 - 2018/12
Principal Supervisor El-Ammari, Khaled (Completed) , Concordia University
Thesis/Project Title: Collaborative Mixed Reality Approaches for Supporting Facilities Life Cycle Management
Present Position: Lead Mixed Reality Architect, Fiction Mine

Event Administration

- 2023/8 - 2025/7 General Conference Chair, The International Symposium on Automation and Robotics in Construction (ISARC) 2025, Conference, 2025/7 - 2025/7
- 2021/11 - 2021/11 Member of the organizing and scientific committee, International Symposium of Automation and Robotic in Construction, Conference, 2021/11 - 2021/11
- 2018/6 - 2019/6 Co-chair of the scientific committee, 7th CSCE Construction Specialty Conference jointly held with the Construction Research Congress (CRC 2019), Laval, Canada, Conference, 2019/6 - 2019/6
- 2018/6 - 2019/6 Member of the scientific committee, 26 Workshop of the European Group for Intelligent Computing in Engineering, Leuven, Belgium, Conference, 2019/6 - 2019/6
- 2017/12 - 2018/12 Member of the scientific committee (Construction and Project Management Track), IEEE Winter Simulation Conference, 2018, Gothenburg, Sweden, Conference, 2018/12 - 2018/12
- 2017/10 - 2018/10 Member of the scientific committee, 35th CIB W78 2018 Conference, Chicago, Conference, 2018/10 - 2018/10
- 2017/7 - 2018/7 Member of the scientific committee, International Symposium on Automation and Robotics in Construction, 2018, Berlin, Germany, Conference, 2018/7 - 2018/7
- 2017/6 - 2018/6 Member of the scientific committee, 17th International Conference on Computing in Civil and Building Engineering, Tampere, Finland, Conference, 2018/6 - 2018/6
- 2017/6 - 2018/6 Member of the scientific committee, 25th Workshop of the European Group for Intelligent Computing in Engineering, Lausanne, Switzerland, Conference, 2018/6 - 2018/6
- 2016/12 - 2017/12 Chair of Architecture and Construction Track, IEEE Winter Simulation Conference, 2017, Las Vegas, Nevada, Conference, 2017/12 - 2017/12

2016/6 - 2017/6 Member of the technical Committee, 2017 International Workshop on Computing for Civil Engineering (IWCCE 2017), Seattle, WA, Conference, 2017/6 - 2017/6

Knowledge and Technology Translation

2017/1 - 2018/10 Researcher, R&D Collaboration with Industry
 Group/Organization/Business Serviced: Indus.AI (startup company)
 Target Stakeholder: Industry/Business (>500 employees)
 Outcome / Deliverable: I have been collaborating since 2017 with the personnel of Indus.AI on several research projects related to the application of computer vision and RTLS for automated data collection on construction sites.
 References / Citations / Web Sites: <https://www.indus.ai/>

International Collaboration Activities

2023/11 - 2023/11 Expert researcher, Spain
 Received grant from Ministère des Relations internationales et de la Francophonie in the scope of the cooperation program between Québec and Basque Region to conduct collaborative research project at EHU University about multi-purpose utility tunnels.

2023/9 - 2023/10 Expert panel member, United States of America
 Invited to participate in the Utilidor Value Engineering Study organized by New York City Mayor's Office of Management & Budget. I am the only panelist from outside the US.

Committee Memberships

2017/4 Committee Member, Faculty Adjudication Committee for University Research Award and Petro-Canada Young Innovator Award Nominations/Applications, Concordia University
 My role in this committee was to score the applications for several awards.

2017/3 Committee Member, Faculty Adjudication Committee for Individual Seed, Team Start-Up, and Team Accelerator applications., Concordia University
 My role in this committee was to score the applications for several awards.

2017/2 Committee Member, ENCS Faculty committees Health and Safety Committee, Concordia University

2016/1 Committee Member, Engineering and Computer Science Faculty Cluster Users Committee, Concordia University
 This committee coordinates the use of high-performance computing resources at Concordia

2014/1 - 2018/12 Committee Member, CIISE Department Tenure Committee, Concordia University

Other Memberships

2019/4 Associate Director, Concordia University
 I am the Associate Founding Director of CICIEM (Centre for Innovation in Construction & Infrastructure Engineering & Management)

2012/5 Member, Construction Research Council, American Society of Civil Engineering

2010/5 Member, Construction Division, Canadian Society for Civil Engineering

Presentations

1. (2021). Multi-purpose Utility Tunnels: Location Selection, Cost-Sharing Economical Analysis, and Information Modeling. Ney York City Under the Ground: Planning, Management, and Utilization.2 Subsurface Transformations for a Smart, Sustainable and Resilient City, Montréal, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: Yes
2. Dr. Amin Hammad, Dr. Osama Moselhi, Dr. Nenand Gucunski, Mr. Ramin Attar, Mr. Sina Karimi. <https://constructioncic.ca/event/robotics-in-construction-seminar/>. (2021). Robotics in Construction. CICIEM online seminar, Online, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No
3. Dr. Amin Hammad, Dr. Osama Moselhi, Dr. Mani Golparvar, Mr. Darren Nelson, Mr. Andy Hares. (2021). New Development of Digital Transformation of the Construction Industry. CICIEM Workshop: Digital Transformation of the Construction Industry, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: Yes

Text Interviews

- 2023/06/09 Augmented Reality, A Reality on Construction Sites (La réalité augmentée, un allié sur les chantiers), Constructo, https://www.portailconstructo.com/tendances_opportunités/realite_augmentee_allie_sur_chantiers
- 2018/05/15 En route vers le chantier intelligent (Towards the Smart Construction Site), Constructo (major Canadian magazine for the Construction industry) http://www.portailconstructo.com/infoconstructo/route_vers_chantier_intelligent
- 2018/04/09 Road closures: a prescription for prevention, Op-ed in Infrastructure edition of Ottawa's Hill Times newspaper
- 2018/03/05 L'intelligence artificielle au service de la construction (Artificial Intelligence at the Service of Construction), Le Devoir (a major newspaper in Quebec) <http://www.ledevoir.com/societe/521873/l-intelligence-artificielle-au-service-de-la-construction>
- 2018/02/20 Civil engineers at Concordia devise a cost-saving solution for cities: The framework facilitates the coordination of urban road and water repairs, Concordia University News <http://www.concordia.ca/cunews/main/stories/2018/02/20/research-civil-engineers-cost-saving-solution-for-cities.html>
- 2018/01/11 Virtual reality and augmented reality: leading-edge technologies driving innovation in Montréal, Innovation Développement Montreal Newsletter <https://ville.montreal.qc.ca/idmtl/en/virtual-reality-and-augmented-reality-leading-edge->
- 2017/12/17 Champlain Bridge: 'Hoping for no winter and no wind' with one year to go, Montreal Gazette <https://montrealgazette.com/news/local-news/champlain-bridge-hoping-for-no-winter-and-no-wind-with-one-year-to-go>

Publications

Journal Articles

1. Taher, A.*, Vahdatikhaki, F., Hammad, A. (2023). Extending Earthwork Ontology to Enhance Operation Safety. Knowledge and Information Systems.
Submitted
Refereed?: Yes, Open Access?: No
2. Bahreini, F.* and Hammad, A. (2023). Dynamic Graph CNN Based Semantic Segmentation of Concrete Defects and As-Inspected Modeling.Automation in Construction.
Revision Requested
Refereed?: Yes, Open Access?: No
3. Torabi, G.*, Hammad, A., Bouguila, N. (2023). Two-Dimensional and Three-Dimensional CNN-Based Simultaneous Detection and Activity Classification of Construction Workers. Journal of Computing in Civil Engineering.
Published
Refereed?: Yes, Open Access?: No
4. Alaghbandrad, A.* and Hammad, A. (2023). Framework of Multi-purpose Utility Tunnel Information Modeling for Lifecycle Management. Advanced Engineering Informatics.
Submitted
Refereed?: Yes, Open Access?: No
5. Liu, Z.*, Salimi, S.*, and Hammad, A. (2023). Sensitivity Analysis of Local Climate Control in Shared Offices Based on Occupants Locations. Sustainable Cities and Society.
Submitted
Refereed?: Yes, Open Access?: No
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Paper
Published
Refereed?: Yes, Invited?: No
51. Guevremont, M.* and Hammad, A. (2017). Criticality Visualization Using 4D Simulation for Major Capital Projects. 50th Winter Simulation Conference (IEEE), Las Vegas, United States of America (2360-2371)
Paper
Published
Refereed?: Yes, Invited?: No
52. Taher, A.*, Vahdatikhaki, F., and Hammad, A. (2017). Towards Developing an Ontology for Earthwork Operations. Int. Workshop on Computing in Civil Engineering, Seattle, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
53. Soltani, M.M.*, Karandish, S.F.*, Ahmed, W., Zhu, Z., and Hammad, A. (2017). Evaluating the Performance of Convolutional Neural Network for Classifying Equipment on Construction Sites. International Symposium on Automation and Robotics in Construction, Taipei, Taiwan
Paper
Published
Refereed?: Yes, Invited?: No
54. Salimi, S.*, Zheng, L.* and Hammad, A. (2017). Simulation-based Optimization of Energy Consumption and Discomfort in Multi-Occupied Offices Considering Occupants Locations and Preferences. Building Simulation Conference, San Francisco, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
55. Salimzadeh, N.* and Hammad, A. (2017). High-level framework for GIS-based optimization of building photovoltaic potential at urban scale using BIM and LiDAR. International Conference on Sustainable Infrastructure,
Paper
Published
Refereed?: Yes, Invited?: No
56. Bolourian, A.*, Soltani, M.M.*, Hammad, A., and Albahri, A.*. (2017). High Level Framework for Bridge Inspection Using LiDAR-equipped UAV. International Symposium on Automation and Robotics in Construction, Taipei, Taiwan
Paper
Published
Refereed?: Yes, Invited?: No

Date Submitted: 2024-02-01 15:32:19

Confirmation Number: 1737118

Template: Full CV

Dr. Walter Lucia

Correspondence language: English

Sex: Male

Date of Birth: 12/31

Canadian Residency Status: Permanent Resident

Permanent Residency Start Date: 2021/01/25

Contact Information

The primary information is denoted by (*)

Address

Primary Affiliation (*)

1515 St.Catherine Street West, EV.009.185

CIISE, Concordia University

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Work (*) 514-8482424 extension: 3982

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Website

Personal <https://users.encs.concordia.ca/~wlucia/index.html>

Dr. Walter Lucia

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	No	No	Yes	No
Italian	Yes	Yes	Yes	Yes	Yes

Degrees

2012/11 - 2015/2	Doctorate, Doctor of Philosophy in System and Computer Engineering, Control Systems, Universita Di Calabria Degree Status: Completed Supervisors: Giuseppe Franzè, 2012/11 - 2015/2
2009/1 - 2011/3	Master's Thesis, Automation Engineering, Automation Engineering, Universita Di Calabria Degree Status: Completed
2005/9 - 2008/12	Bachelor's, Computer Engineering, Computer Engineering, Universita Di Calabria Degree Status: Completed

Credentials

2020/8	Associate Editor - IEEE Systems Journal, IEEE
2020/7	Professional Engineer Ontario (PEO), Professional Engineer Ontario
2020/7	Associate Editor - Journal of Control, Automation and Electrical Systems, Springer
2018/11	Chair of the IEEE Montreal Chapter: Control Systems, IEEE
2018/8	Associate Editor (Conference Editorial Board) - IEEE Control System Society, IEEE
2017/7	Chair of the IEEE Montreal Chapter: Systems, Man & Cybernetics, IEEE
2016/11	Assistant Professor, Concordia University

Recognitions

2021/11	Distinguished Reviewer Award IEEE International Conference on Autonomous Systems (ICAS) Distinction Best Reviewer Award
2021/5	Gina Cody School Award for Excellence in Teaching by a Junior Faculty Member Concordia University Distinction Teaching Award

- 2019/4 Best Paper Award in the 6th International Conference on Control Decision and Information Technologies (CoDIT 2019)
IEEE Systems, Man, and Cybernetics Society
Prize / Award
Best Paper Award
- 2015/1 - 2016/10 Postdoctoral Fellowship, POR Calabria (CCI No 2007 IT 161 PO 008)
Universita Di Calabria
Prize / Award
Scholarship for research on automotive powertrain

User Profile

Researcher Status: Researcher

Research Interests: **Networked Control Systems and Secure and Resilient Control of Cyber-Physical Systems:** Development of set-theoretic control strategies for networked systems subject to time-varying delays, packet dropouts and cyber-attacks. **Model predictive control strategies for autonomous vehicles:** Development of optimal, real-time affordable and predictive control strategies for autonomous vehicles moving in adverse environments. **Fault tolerant control:** Development of model predictive control schemes for plant subject to stuck actuators and sensors. **Control of switching/switched systems:** Development of control strategies capable of dealing with plants characterized by a finite collection of switching/switched dynamical models.

Research Specialization Keywords: Model Predictive Control, Set-Theoretic Control, Cyber-Physical Systems, Networked Control Systems, Fault-Tolerant Control, Control of Unmanned Vehicles

Disciplines Trained In: Computer Engineering and Software Engineering, Electrical Engineering and Electronic Engineering

Research Disciplines: Computer Engineering and Software Engineering, Electrical Engineering and Electronic Engineering

Areas of Research: Control System

Fields of Application: Energy, Security, Transport

Employment

- 2021/6 Associate Professor
Concordia Institute for Information Systems Engineering (CIISE), Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2016/11 - 2021/5 Assistant Professor
Concordia Institute for Information Systems Engineering (CIISE), Faculty of Engineering, Concordia University
Full-time, Assistant Professor
Tenure Status: Tenure Track
- 2015/1 - 2016/11 Postdoctoral Researcher
DIMES, Faculty of Engineering, Universita Di Calabria
Full-time
Tenure Status: Non Tenure Track
- 2015/9 - 2016/2 Postdoctoral Researcher
ECE, Faculty of Engineering, Carnegie-Mellon University
Full-time
Tenure Status: Non Tenure Track
Develop of control techniques for secure control of Cyber-Physical systems

2013/3 - 2013/12 Visiting Research Scholar
 ECE, Faculty of Engineering, Northeastern University
 Full-time
 Tenure Status: Non Tenure Track
 Research on control strategies for quadcopters

Affiliations

The primary affiliation is denoted by (*)

(*) 2021/6 Associate Professor, CIISE, Concordia University

2016/11 - 2021/5 Assistant Professor, CIISE, Concordia University

Research Funding History

Awarded [n=6]

2018/5 - 2025/3 Secure and Resilient Control of Constrained Cyber-Physical Systems Subject to Network
 Principal Applicant Attacks, Grant

Funding Sources:

2018/4 - 2025/3 Natural Sciences and Engineering Research Council of Canada
 (NSERC)
 Total Funding - 196,000 (Canadian dollar)
 Portion of Funding Received - 196,000
 Funding Competitive?: Yes

2021/5 - 2024/4 Atténuation résiliente, détection et contrôle de la récupération des infrastructures critiques
 Co-applicant sujettes à des cyberattaques et intrusions malveillantes, Grant

Funding Sources:

2021/4 - 2024/3 Fonds de recherche du Québec - Nature et technologies (FRQNT)
 Total Funding - 150,000 (Canadian dollar)
 Portion of Funding Received - 31,600
 Funding Competitive?: Yes

2023/7 - 2023/12 Control of multi-agent robots: an opinion dynamics approach, Grant
 Principal Investigator Project Description: Distributed Positioning and Formation Management Techniques in a
 Swarm of Robots

Funding Sources:

2023/7 - 2023/11 Mathematics of Information Technology and Complex Systems
 (MITACS)
 MITACS Globalink Research Award for research Abroad
 Total Funding - 6,000 (Canadian dollar)
 Portion of Funding Received - 6,000 (Canadian dollar)
 Funding Competitive?: Yes

2023/7 - 2023/12 Distributed Positioning and Formation Management Techniques in a Swarm of Robots,
 Principal Applicant Grant
 Project Description: Control of multi-agent robots: an opinion dynamics approach

Funding Sources:

2023/7 - 2023/11 Mathematics of Information Technology and Complex Systems (MITACS)
 MITACS Globalink Research Award for research Abroad
 Total Funding - 6,000 (Canadian dollar)
 Portion of Funding Received - 6,000 (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

2022/9 - 2023/9
 Co-applicant

Cybersecurity Monitoring, Diagnosis, Mitigation & Resilient Operation of Naval IT/OT/PT Systems Against Malicious Attacks, Grant
 Project Description: Cybersecurity Monitoring, Diagnosis, Mitigation & Resilient Operation of Naval IT/OT/PT Systems Against Malicious Attacks

Funding Sources:

2022/9 - 2023/9 Innovation for Defence Excellence and Security (IDEaS)
 Total Funding - 1,000,000 (Canadian dollar)
 Portion of Funding Received - 166,000 (Canadian dollar)
 Funding Competitive?: Yes

2019/5 - 2023/4
 Principal Applicant

Secure and Resilient Control of Constrained Cyber-Physical Systems Subject to Network Attacks, Grant

Funding Sources:

2018/4 - 2023/4 Natural Sciences and Engineering Research Council of Canada (NSERC)
 DGEER – Discovery Launch Supplement
 Total Funding - 12,500 (Canadian dollar)
 Portion of Funding Received - 12,500
 Funding Competitive?: Yes

Completed [n=10]

2023/2 - 2023/8
 Principal Applicant

Set-Theoretic Output Feedback Control for Safety-Critical LPVsystems, Grant
 Project Description: Set-Theoretic Output Feedback Control for Safety-Critical LPVsystems

Funding Sources:

2023/2 - 2023/8 Mathematics of Information Technology and Complex Systems (MITACS)
 MITACS Globalink Research Award for research in Canada
 Total Funding - 6,000 (Canadian dollar)
 Portion of Funding Received - 6,000 (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

2020/11 - 2022/12
 Co-applicant

Toward Intelligent and Resilient Smart Cities with Energy-Vehicle-Human Interactions, Grant, Equipment

Funding Sources:

2020/5 - 2024/12 Canada Foundation for Innovation (CFI)
 Total Funding - 1,808,000 (Canadian dollar)
 Portion of Funding Received - 214,000 (Canadian dollar)
 Funding Competitive?: Yes

2022/1 - 2022/6
 Principal Applicant

Experimental validation of Cyber-Physical systems security techniques, Grant

Project Description: Setpoint attacks detection in cyber-physical systems: experimental validation using unmanned vehicles

Funding Sources:

2019/9 - 2020/2 Mathematics of Information Technology and Complex Systems (MITACS)
MITACS Globalink Research Award for research Abroad
Total Funding - 6,000 (Canadian dollar)
Portion of Funding Received - 6,000
Funding Competitive?: Yes

2019/5 - 2021/4
Principal Applicant

Computationally low demanding model predictive control strategies for the secure control of autonomous vehicles in smart cities, Grant, Establishment

Funding Sources:

2019/4 - 2021/4 Fonds de recherche du Québec - Nature et technologies (FRQNT)
Etablissement de la relève professorale
Total Funding - 89,100 (Canadian dollar)
Portion of Funding Received - 89,100
Funding Competitive?: Yes

2020/1 - 2020/10
Co-applicant

Multivariable PID Controller for Search and Rescue UAV Operations Based on Static Output Feedback, Grant

Funding Sources:

2020/1 - 2020/6 Mathematics of Information Technology and Complex Systems (MITACS)
MITACS Accelerate
Total Funding - 15,000 (Canadian dollar)
Portion of Funding Received - 7,500
Funding Competitive?: Yes

Co-applicant : Luis Rodrigues

2019/9 - 2020/2
Principal Applicant

Formation control of unmanned aerial vehicles in presence of obstacles, Grant
Project Description: Experimental validation of Cyber-Physical systems security techniques

Funding Sources:

2019/1 - 2019/6 Mathematics of Information Technology and Complex Systems (MITACS)
MITACS Globalink Research Award for research in Canada
Total Funding - 6,000 (Canadian dollar)
Portion of Funding Received - 6,000
Funding Competitive?: Yes

2019/5 - 2019/11
Principal Applicant

Setpoint attacks detection in cyber-physical systems: experimental validation using unmanned vehicles, Grant
Project Description: Formation control of unmanned aerial vehicles in presence of obstacles

Funding Sources:

2019/7 - 2020/7 Mathematics of Information Technology and Complex Systems (MITACS)
 MITACS Globalink Research Award for research Abroad
 Total Funding - 6,000 (Canadian dollar)
 Portion of Funding Received - 6,000
 Funding Competitive?: Yes

2016/11 - 2019/4
 Principal Applicant

Concordia University Start-Up Grant, Grant, Establishment

Funding Sources:

2016/11 - 2019/4 Concordia University
 Total Funding - 50,000 (Canadian dollar)
 Portion of Funding Received - 50,000
 Funding Competitive?: No

2018/3 - 2019/3
 Co-applicant

Intelligent Control, Diagnosis, and Security of Smart Grid Networks, Grant, Equipment

Funding Sources:

2018/1 - 2018/12 Concordia University
 Total Funding - 100,000 (Canadian dollar)
 Portion of Funding Received - 14,000 (Canadian dollar)
 Funding Competitive?: Yes

2018/3 - 2019/3
 Co-applicant

STARBASE-I: Integrated Smart Microgrids and Autonomous Vehicles Research TestBed for Smart Connected Communities, Grant, Equipment

Funding Sources:

2018/1 - 2018/12 Concordia University
 Total Funding - 100,000 (Canadian dollar)
 Portion of Funding Received - 14,000 (Canadian dollar)
 Funding Competitive?: Yes

Courses Taught

Instructor, Concordia University

Course Title: Principle of Electric Engineering

Course Topic: Principle of Electric Engineering

Course Level: Undergraduate

Instructor, Concordia University

Course Title: Robotic Manipulator II: Control

Course Topic: Robotic Manipulator

Course Level: Graduate

Instructor, Concordia University

Course Title: Smart Grids and Control Systems Security

Course Topic: Smart Grid Security

Course Level: Graduate

Instructor, Concordia University

Course Title: Recent Developments in Information Systems Security

Course Topic: Cyber-Physical Systems Security

Course Level: Graduate

Instructor, Concordia University
 Course Title: Fundamentals and Applications of Cyber-Physical Systems
 Course Topic: Cyber-Physical Systems
 Course Level: Graduate

Instructor, Concordia University
 Course Title: Fundamentals of Control Systems
 Course Code: ELEC 372
 Course Topic: Control Systems
 Course Level: Undergraduate

Student/Postdoctoral Supervision

Master's Thesis [n=11]

2022/9 - 2024/9 Principal Supervisor	Suryaprakash Rajkumar (In Progress) , Concordia University Student Degree Start Date: 2022/9 Thesis/Project Title: Control of Intelligent Transportation Systems Present Position: Master Student
2020/9 - 2022/12 Principal Supervisor	Amir Mohammad Naseri (Completed) , Concordia University Student Degree Start Date: 2020/9 Student Degree Received Date: 2022/12 Thesis/Project Title: Encrypted Control Systems Present Position: Master Student
2020/1 - 2022/9 Co-Supervisor	Mattia Cersullo (Completed) , University of Calabria Student Degree Start Date: 2020/1 Student Degree Received Date: 2022/12 Thesis/Project Title: Set-point attach detection in cyber-physical systems Present Position: Automation and Control Engineer
2019/1 - 2020/12 Co-Supervisor	Ahmed Mohamed AbdELwahhab (Completed) , Concordia University Student Degree Start Date: 2019/1 Student Degree Received Date: 2020/12 Thesis/Project Title: Secure Control of Smart Grids subject to cyber attacks Present Position: Cyber Security Analyst, Bell Canada
2019/1 - 2020/12 Principal Supervisor	Shima Savehshemshaki (Completed) , Concordia University Student Degree Start Date: 2019/1 Student Degree Received Date: 2019/1 Thesis/Project Title: Control of Autonomous Vehicles Present Position: Software Designer, Matrox
2019/1 - 2021/6 Co-Supervisor	Alan Cristoffer (Completed) , University Unidade Divinópolis (Brasil) Student Degree Start Date: 2017/1 Student Degree Received Date: 2020/12 Thesis/Project Title: Command Governor Strategies for Switching Systems Present Position: PhD Student, Université de Reims Champagne-Ardenne
2018/1 - 2020/6 Co-Supervisor	Cristian Tiriolo (Completed) , University of Calabria Student Degree Start Date: 2018/1 Student Degree Received Date: 2020/12 Thesis/Project Title: Control of Unmanned Vehicles Present Position: PhD Student, Concordia University

- 2017/9 - 2019/11
Principal Supervisor Ghaderi, Mohsen (Completed) , Concordia University
Student Degree Start Date: 2017/9
Student Degree Received Date: 2019/12
Thesis/Project Title: Fault Tolerant Control Systems For Vehicle Formation
Present Position: Software Developer, Amdocs
- 2017/9 - 2020/8
Principal Supervisor Bagherzadeh, Maryam (Completed) , Concordia University
Student Degree Start Date: 2017/9
Student Degree Received Date: 2020/3
Thesis/Project Title: Predictive control strategies for autonomous vehicles
Present Position: Software Engineer, Segula Technologies
- 2017/1 - 2019/6
Co-Supervisor Antonello Venturino (Completed) , University of Calabria
Student Degree Start Date: 2017/1
Student Degree Received Date: 2019/12
Thesis/Project Title: A distributed model predictive control strategy for teams of autonomous vehicles operating in uncertain environments
Present Position: PhD Student, Université Paris-Saclay and ONERA
- 2016/1 - 2018/6
Co-Supervisor Flavia Grandinetti (Completed) , University of Calabria
Student Degree Start Date: 2016/1
Student Degree Received Date: 2018/12
Thesis/Project Title: Tracking controllers for drone swarms
Present Position: Flight Control System Engineering, Leonardo Helicopters

Doctorate [n=4]

- 2021/9 - 2025/9
Principal Supervisor Geovana Franca (In Progress) , Concordia University
Student Degree Start Date: 2021/9
Thesis/Project Title: Constrained Output Feedback Control
Present Position: PhD Student
- 2020/9 - 2024/9
Principal Supervisor Mehran Attar (In Progress) , Concordia University
Student Degree Start Date: 2020/9
Thesis/Project Title: Data-driven methods for Cyber-Physical Systems
Present Position: PhD Student
- 2020/9 - 2024/9
Principal Supervisor Cristian Tiriolo (In Progress) , Concordia University
Student Degree Start Date: 2020/9
Thesis/Project Title: Control of Unmanned Vehicles
Present Position: PhD Student
- 2017/9 - 2022/1
Principal Supervisor Gheitasi, Kian (Completed) , Concordia University
Student Degree Start Date: 2017/9
Student Degree Received Date: 2022/1
Thesis/Project Title: Secure and Resilient Control of Cyber-Physical Systems
Present Position: PhD student, Concordia University

Editorial Activities

- 2020/6 Associate Editor, Elsevier Journal of Control, Automation and Electrical Systems, Journal
- 2018/1 Associate Editor, IEEE Control System Society - Conference Editorial Board, Conference Abstract

Journal Review Activities

Reviewer,IEEE Transactions on Smar Grid
Number of Works Reviewed / Refereed: 2

Reviewer,Asian Journal of Control,Wiley
Number of Works Reviewed / Refereed: 2

Reviewer,European Journal of Control
Number of Works Reviewed / Refereed: 2

Reviewer,IEEE Transactions on Systems, Man, and Cybernetics: Systems
Number of Works Reviewed / Refereed: 1

Reviewer,Asian Journal of Control
Number of Works Reviewed / Refereed: 1

Reviewer,IEEE Transactions on Automatic Control,IEEE
Number of Works Reviewed / Refereed: 20

Reviewer,IET Control Theory & Applications,IET
Number of Works Reviewed / Refereed: 11

Reviewer,IEEE Transactions on Control Systems Technology,IEEE
Number of Works Reviewed / Refereed: 8

Reviewer,IET Signal Processing,IET
Number of Works Reviewed / Refereed: 2

Reviewer,International Journal of Adaptive Control and Signal Processing
Number of Works Reviewed / Refereed: 3

Reviewer,IEEE Transactions on Control of Network System,IEEE
Number of Works Reviewed / Refereed: 12

Reviewer,IEEE/CAA Journal of Automatica Sinica,IEEE/CAA
Number of Works Reviewed / Refereed: 5

Reviewer,Control Engineering Practice,Elsevier
Number of Works Reviewed / Refereed: 1

Reviewer,Journal of Control, Automation and Electrical Systems,Springer
Number of Works Reviewed / Refereed: 1

Reviewer,IEEE Access,IEEE

Reviewer,Journal of Franklin Institute,Elsevier
Number of Works Reviewed / Refereed: 14

Reviewer,IEEE Control Systems Letters
Number of Works Reviewed / Refereed: 12

Reviewer,Automatica,Elsevier
Number of Works Reviewed / Refereed: 17

Reviewer,Transactions on Signal and Information Processing over Network,IEEE
Number of Works Reviewed / Refereed: 1

Conference Review Activities

Reviewer, IEEE Conference on Decision and Control, Blind, IEEE
Number of Works Reviewed / Refereed: 10

Reviewer, International Conference on Control, Decision and Information Technologies, Blind

Number of Works Reviewed / Refereed: 2

Reviewer, European Control Conference, Blind

Number of Works Reviewed / Refereed: 4

Reviewer, International Conference on Cyber-Physical Systems, Blind

Number of Works Reviewed / Refereed: 1

Reviewer, IEEE Conference on Control Technology and Applications, Blind

Number of Works Reviewed / Refereed: 6

Reviewer, Mediterranean Conference on Control and Automation, Blind

Number of Works Reviewed / Refereed: 2

Reviewer, IFAC World Congress, Blind, IFAC

Number of Works Reviewed / Refereed: 5

Reviewer, American Control Conference, Blind

Number of Works Reviewed / Refereed: 4

Committee Memberships

2018/9 Chair, IEEE Control System (CS) Society, Montreal Chapter, IEEE

2017/7 Chair, IEEE Systems, Man & Cybernetics (SMC) Society, Montreal Chapter, IEEE

Publications

Journal Articles

1. M. Attar and W. Lucia. (2023). *An active detection strategy based on dimensionality reduction for false data injection attacks in cyber-physical systems*. IEEE Transactions on Control of Network Systems (CONES). In Press,
Refereed?: Yes, Open Access?: No
2. A. Rahiminejad, M. Ghafouri, R. Atallah, W. Lucia, M. Debbabi, and A. Mohammadi. (2023). Resilience enhancement of islanded microgrids by diversification, reconfiguration, and der placement/sizing. International Journal of Electrical Power and Energy Systems. 147
Published,
Refereed?: Yes
3. C. Tiriolo, W. Lucia. (2023). On the design of control invariant regions for feedback linearized car-like vehicles. IEEE Control Systems Letters. 7: 739-744.
Published,
Refereed?: Yes
4. W. Lucia, G. Franze', B. Sinopoli. (2023). A supervisor-based control architecture for constrained cyber-physical systems subject to network attacks. IEEE Transactions on Control of Network Systems. 10(3): 1184-1194.
Published,
Refereed?: Yes

5. K. Gheitasi, W. Lucia. (2023). A worst-case approach to safety and reference tracking for cyber-physical systems under network attacks. *IEEE Transactions on Automatic Control*. 68(7): 4391-4397.
In Press,
Refereed?: Yes
6. W. Lucia, J. G. Ernesto, and E. B. Castelan. (2023). *Set-theoretic output feedback control: a bilinear programming approach*. *Automatica*.
In Press,
Refereed?: Yes, Open Access?: No
7. C. Tiriolo and W. Lucia. (2023). *A set-theoretic control approach to the trajectory tracking problem for input-output linearized wheeled mobile robots*. *IEEE Control Systems Letters (L-CSS)*.
In Press,
Refereed?: Yes, Open Access?: No
8. M. Attar and W. Lucia. (2023). *Data-driven robust backward reachable sets for set-theoretic model predictive control*. *IEEE Control Systems Letters (L-CSS)*.
In Press,
Refereed?: Yes, Open Access?: No
9. G. A. Franca dos Santos, E. B. Castelan, and W. Lucia. (2023). *On the design of constrained pi-like output-feedback tracking controllers via robust positive invariance and bilinear programming*. *IEEE Control System Letters (L-CSS)*. 7: 1429–1434.
Published,
Refereed?: Yes
10. G. Franze', D. Famularo, W. Lucia, F. Tedesco. (2023). Cyber-physical systems subject to false data injections: a model predictive control framework for resilience operations. *Automatica*.
Accepted,
Refereed?: Yes
11. W. Lucia and A. Youssef. (2022). A key agreement scheme for cyber-physical systems. *IEEE Transactions on Systems, Man, and Cybernetics: Systems*. 52(8): 5368-5373.
Published,
Refereed?: Yes
12. G. Franze', W. Lucia, and F. Tedesco. (2022). Resilient model predictive control for constrained networked systems subject to severe attacks on the communication channels. *IEEE Transactions on Automatic Control*. 67(4): 1822-1836.
Published,
Refereed?: Yes
13. C. Tiriolo, G. Franze', and W. Lucia. (2022). A receding horizon trajectory tracking strategy for input-constrained differential-drive robots via feedback-linearization. *IEEE Transactions on Control Systems Technology*.
In Press,
Refereed?: Yes
14. A. M. Naseri, W. Lucia, A. Youssef. (2022). Confidentiality attacks against encrypted control systems. *Cyber-Physical Systems*. : 1-20.
Published,
Refereed?: Yes
15. M. Babahaji, S. Blouin, W. Lucia, M. M. Asadi, H. Mahboubi, A. G. Aghdam. (2022). Estimation of the connectivity of random graphs through q-learning techniques. *Journal of Radio Frequency Identification*. 6: 318-331.
Published,
Refereed?: Yes

16. A. M. Naseri, W. Lucia, A. Youssef. (2022). Encrypted cloud-based set-theoretic model predictive control. *IEEE Control System Letters*. 6: 3031-3037.
Published,
Refereed?: Yes
17. M. Bagherzadeh, S. Savehshemshaki, and W. Lucia. (2022). Guaranteed collision-free reference tracking in constrained multi unmanned vehicle systems. *IEEE Transactions on Automatic Control*. 67(6): 3087-3089.
Published,
Refereed?: Yes
18. K. Gheitasi, W. Lucia. (2022). Undetectable finite-time covert attack on constrained cyber-physical systems. *IEEE Transactions on Control of Network Systems*. 9(2): 1040-1048.
Published,
Refereed?: Yes
19. A.C. e Sousa, W. Lucia, Luis FP Silva, V. JS Leite. (2022). Command governor strategy based on region of attraction control switching. *Journal of Control, Automation and Electrical Systems*. 33(3): 767-779.
Published,
Refereed?: Yes
20. G. Franze', W. Lucia, A. Venturino. (2021). A distributed model predictive control strategy for constrained multi-vehicle systems moving in unknown environments. *IEEE Transaction on Intelligent Vehicles*. 6(2): 343-352.
Published,
Refereed?: Yes
21. K. Gheitasi, W. Lucia. (2021). A safety preserving control architecture for cyber-physical systems. *International Journal of Robust and Nonlinear Control*. 31(8): 3036-3053.
Published,
Refereed?: Yes
22. W. Lucia, G. Franze', D. Famularo. (2021). A receding horizon event-driven control strategy for intelligent traffic management. *Discrete Event Dynamic Systems: Theory and Applications Journal*. 31(3): 469-488.
Published,
Refereed?: Yes
23. M. Ghaderi, K. Gheitasi, and W. Lucia. (2021). A blended active detection strategy for false data injection attacks in cyber-physical systems. *IEEE Transactions on Control of Network Systems*. 8(1): 168-176.
Published, IEEE,
Refereed?: Yes
24. W. Lucia and A. Youssef. (2021). Covert channels in stochastic cyber-physical systems. *IET Cyber-Physical Systems: Theory & Applications*. 6(4): 228-237.
Published,
Refereed?: Yes
25. G. Franze', D. Famularo, W. Lucia, and F. Tedesco. (2020). A resilient control strategy for cyber-physical systems subject to denial of service attacks: a leader-follower set-theoretic approach. *IEEE/CAA Journal of Automatica Sinica*. 7(5): 1204-1214.
Published,
Refereed?: Yes
26. W. Lucia, K. Gheitasi, and M. Ghaderi. (2020). Setpoint attack detection in cyber-physical systems. *IEEE Transactions on Automatic Control (TAC)*. 66(5): 2332-2338.
Published,
Refereed?: Yes, Open Access?: No

27. W. Lucia and A. Youssef. (2020). Wyner wiretap-like encoding scheme for cyber-physical systems. *IET Cyber-Physical Systems: Theory & Applications*. 5(4): 359-365.
Published, IET,
Refereed?: Yes
28. M. Bagherzadeh. and W. Lucia. (2020). A set-theoretic model predictive control approach for transient stability in smart grid. *IET Control Theory & Applications*. 14(5): 700-707.
Published,
Refereed?: Yes, Open Access?: No
29. Lucia W, Franze' G, Sznaier M. (2020). A Hybrid Command Governor scheme for rotary wings unmanned aerial vehicles. *IEEE Transactions on Control System Technology*. 28(2): 361-375.
Published,
Refereed?: Yes
30. A. Abdelwahab, W. Lucia, and A. Youssef. (2020). Covert channels in cyber-physical systems. *IEEE Control Systems Letters*. 5: 1273-1278.
Published,
Refereed?: Yes
31. G. Franze', F. Tedesco, and W. Lucia. (2019). Resilient control for cyber-physical systems subject to replay attacks. *IEEE Control Systems Letters*. 3(4): 989-989.
Published,
Refereed?: Yes
32. Famularo D, Franze' G, Lucia W, Manna C. (2019). A reconfiguration control framework for constrained systems with sensor stuck faults. *International Journal of Robust and Nonlinear Control*. 29(4): 1150-1164.
Published,
Refereed?: Yes
33. Franzè G, Lucia W, Tedesco F. (2018). A Distributed Model Predictive Control Scheme for Leader-Follower Multi-Agent Systems. *International Journal of Control*. : 1-14.
Published,
Refereed?: Yes, Open Access?: No
34. Lucia W, Famularo D, Franzè G. (2018). A set-theoretic reconfiguration feedback control scheme against simultaneous stuck positions on the actuation channels. *IEEE Transactions on Automatic Control*. 63(8): 2558-2565.
Published,
Refereed?: Yes, Open Access?: No
35. Lucia W, Franzè G. (2017). Stabilization and reference tracking for constrained switching systems: a predictive control approach. *International Journal of Adaptive Control and Signal Processing*. 31(12): 1871-1884.
Published,
Refereed?: Yes
36. Franzè G, Lucia W, Tedesco F. (2017). Command Governor for constrained switched systems with scheduled model transition dwell times. *International Journal of Robust and Nonlinear Control*. 27(18): 4949-4967.
Published,
Refereed?: Yes, Open Access?: No
37. Bou-Harb E, Lucia W, Forti N, Weerakkody S, Sinopoli B. (2017). Cyber Meets Control: A Novel Federated Approach for Resilient CPS Leveraging Real Cyber Threat Intelligence. *IEEE Communications Magazine*. 55(5): 198-204.
Published,
Refereed?: Yes, Open Access?: No

38. Franzè G, Casavola A, Famularo D, Lucia W. (2017). Distributed Receding Horizon Control of Constrained Networked Leader-Follower Formations subject to Packet Dropouts. *IEEE Transactions on Control System Technology*. 26(5): 1798-1809.
Published,
Refereed?: Yes, Open Access?: No
39. Franzè G, Lucia W. (2016). A receding horizon control strategy for autonomous vehicles in dynamic environments. *IEEE Transactions on Control Systems Technology*. 24(2): 695-702.
Published,
Refereed?: Yes, Open Access?: No
40. D'Alfonso L, Lucia W, Muraca P, Pugliese P. (2015). Mobile robot localization via EKF and UKF: a comparison based on real data. *Robotics and Autonomous Systems*. 74: 122-127.
Published,
Refereed?: Yes, Open Access?: No
41. Walter L, Tedesco F. (2015). A networked-based receding horizon scheme for constrained LPV systems. *European Journal of Control*. 25: 69-75.
Published,
Refereed?: Yes, Open Access?: No
42. Franzè G, Lucia W. (2015). An obstacle avoidance model predictive control scheme for mobile robots subject to nonholonomic constraints: a sum-of-squares approach. *Journal of the Franklin Institute*. 352(6): 2358-2380.
Published,
Refereed?: Yes, Open Access?: No
43. Franzè G, Lucia W. (2015). The obstacle avoidance motion planning problem for autonomous vehicles: a low-demanding receding horizon control scheme. *Systems and Control Letters*. 77: 1-10.
Published,
Refereed?: Yes

Conference Publications

1. S. Rajkumar, C. Tiriolo*, W. Lucia. Collision-Free Platooning of Mobile Robots through a Set-Theoretic Predictive Control Approach. American Control Conference (ACC), Toronto, Canada,
Conference Date: 2024/7
Paper
Accepted
Refereed?: Yes, Invited?: No
2. G. A. Franca dos Santos, W. B. Castelan, E. and W. Lucia. (2024). A Constrained Tracking Controller for Ramp and Sinusoidal Reference Signals using Robust Positive Invariance. American Control Conference (ACC), Toronto, Canada,
Conference Date: 2024/7
Paper
Accepted
Refereed?: Yes, Invited?: No
3. A. M. Naseri, W. Lucia, and A. Youssef. (2023). *An observer-based key agreement scheme for remotely controlled mobile robots*. Proceedings of the IFAC World Congress. IFAC World Congress, ,
Paper
Accepted
Refereed?: Yes, Invited?: No

4. C. Tiriolo, G. Franze', W. Lucia. (2023). An obstacle-avoidance receding horizon control scheme for constrained differential-drive robot via dynamic feedback linearization. American Control Conference, San Diego, United States of America,
Paper
Accepted
Refereed?: Yes, Invited?: No
5. J. G. Ernesto, E. B. Castellan, W Lucia, G. A. Franca dos Santos. (2022). Alternative implementation to an incremental output-feedback design approach for constrained discrete-time parameter-varying systems. IFAC-PapersOnLine. IFAC Workshop on Time Delay Systems, IFAC Workshop on Linear Parameter Varying Systems, (Joint SSSC, TDS, LPVS), Montreal, Canada (25-30),
Paper
Published
Refereed?: Yes, Invited?: No
6. A. M. Naseri, W. Lucia, A. Youssef. (2022). A privacy preserving solution for cloud-enabled set-theoretic model predictive control. European Control Conference, (894–899),
Paper
Published
Refereed?: Yes, Invited?: No
7. S. Savehshemshaki, W. Lucia. (2022). A robust receding-horizon collision avoidance strategy for constrained unmanned ground vehicles moving in shared planar environments. IEEE Conference on Decision and Control (CDC), Cancun, Mexico,
Paper
In Press
Refereed?: Yes, Invited?: No
8. M. Cersullo, C. Tiriolo, G. Franze', W. Lucia. (2022). A detection strategy for setpoint attacks against differential-drive robots. IEEE International Conference on Automation Science and Engineering (CASE), Mexico City, Mexico (1035–1040),
Paper
Published
Refereed?: Yes, Invited?: No
9. M. Babahaji, S. Blouin, W. Lucia, M. M. Asadi, H. Mahboubi, A. G. Aghdam. (2021). Random graphs estimation using q-learning. IEEE International Conference on Wireless for Space and Extreme Environments (WiSEE), (109-114),
Paper
Published
Refereed?: Yes, Invited?: No
10. A. M. Naseri, W. Lucia, M. Mannan, A. Youssef. (2021). On securing cloud-hosted cyber-physical systems using trusted execution environments. International Conference on Autonomous Systems (ICAS), Montreal, Canada (1-5),
Paper
Published
Refereed?: Yes, Invited?: No
11. G. Franze', W. Lucia, F. Tedesco. (2021). Covert attack detection for constrained cyber-physical systems regulated by robust model predictive controllers. Proceedings of the American Control Conference. American Control Conference (ACC), (3267-3272),
Paper
Published
Refereed?: Yes, Invited?: No

12. K. Gheitasi and W. Lucia. (2020). A finite-time stealthy covert attack against cyber-physical systems. Proceedings of Conference on Control Decision and Information Technologies. Int. Conference on Control, Decision and Information Technologies (CoDIT), (347-352),
Paper
Published
Refereed?: Yes, Invited?: No
13. S. Savehshemshaki, and W. Lucia. (2020). A receding horizon battery shortage prevention control strategy for electric unmanned vehicles. Proceedings of the IEEE Conference on Control Technology and Applications. IEEE Conference on Control Technology and Applications (CCTA), (261-266),
Paper
Published
Refereed?: Yes, Invited?: No
14. A. Abdelwahab, W. Lucia, and A. Youssef. (2020). Decoy-based moving target defense against cyber-physical attacks on smart grid. IEEE Electric Power and Energy Conference, (1-5),
Paper
Published
Refereed?: Yes, Invited?: No
15. C. Tiriolo, G. Franze, and W. Lucia. (2020). A receding horizon control strategy for constrained differential-drive robots moving in static unknown environment. Proceedings of the IEEE Conference on Control Technology and Applications. IEEE Conference on Control Technology and Applications (CCTA), (261-266),
Paper
Published
Refereed?: Yes, Invited?: No
16. W. Alqaisi, Y. Kali, and W. Lucia. (2020). Finite-time flight control of uncertain quadrotor uav based on modified non-singular fast terminal super-twisting control. Proceedings of the IEEE Conference on Control Technology and Applications. IEEE Conference on Control Technology and Applications, (37-42),
Paper
Published
Refereed?: Yes, Invited?: No
17. Alan C e Sousa, Luis FP Silva, Walter Lucia, and Valter JS Leite. (2020). Command governor strategy based on region of attraction control switching. Anais da Sociedade Brasileira de Automatica, ,
Paper
Published
Refereed?: Yes, Invited?: No
18. A. Abdelwahab, W. Lucia, and A. Youssef. (2020). Set-theoretic control for active detection of replay attacks with applications to smart grid. Proceedings of IEEE Conference on Control Technology and Applications. IEEE Conference on Control Technology and Applications (CCTA), (1004-1009),
Paper
Published
Refereed?: Yes, Invited?: No
19. A. Abdelwahab, W. Lucia, and A. Youssef. (2020). A dos-resilient set-theoretic controller for smart grid applications. Proceedings of IEEE PES General Meeting. IEEE PES General Meeting, (1-5),
Paper
Published
Refereed?: Yes, Invited?: No

20. M. Ghaderi, K. Gheitasi, and W. Lucia. (2019). A novel control architecture for the detection of false data injection attacks in networked control systems. Proceedings of the American Control Conference. American Control Conference (ACC), (134-144),
Paper
Published
Refereed?: Yes, Invited?: No
21. M. Bagherzadeh, W. Lucia. (2019). Multi-vehicle reference tracking with guaranteed collision avoidance. Proceedings of the European Control Conference. European Control Conference (ECC), (3329-3334),
Paper
Published
Refereed?: Yes, Invited?: No
22. A. Venturino, W. Lucia. (2019). A flexible distributed control strategy for teams of vehicles moving within severe obstacle scenarios. Proceedings of the IEEE Int. Conf. on Emerging Technologies and Factory Automation. IEEE International Conference on Emerging Technologies and Factory Automation (EFTA), (941-946),
Paper
Published
Refereed?: Yes, Invited?: No
23. K. Gheitasi, M. Ghaderi, W. Lucia. (2019). Novel networked control scheme with safety guarantees for detection and mitigation of cyber-attacks. Proceedings of the European Control Conference. European Control Conference (ECC), (1449-1454),
Paper
Published
Refereed?: Yes, Invited?: No
24. G. Franze, W. Lucia, F. Tedesco. (2019). A leader-follower set-theoretic approach for cyber-physical systems against denial-of-service attacks. Proceedings of Conference on Control Decision and Information Technologies. Int. Conference on Control Decision and Information Technologies (CoDIT), (73-78),
Paper
Published
Refereed?: Yes, Invited?: No
25. G. Franze, W. Lucia, B. Rahami. (2018). Distributed receding horizon control for rotating wings unmanned aerial vehicles: a time-varying topology strategy. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), (3329-3334),
Paper
Published
Refereed?: Yes, Invited?: No
26. W. Lucia, K. Gheitasi, and M. Bagherzadeh. (2018). A low computationally demanding model predictive control strategy for fast and robust transient stability in smart grid. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), (6013-6018),
Paper
Published
Refereed?: Yes, Invited?: No
27. W. Lucia, K. Gheitasi, and M. Ghaderi. (2018). A command governor based approach for detection of setpoint attacks in constrained cyber-physical systems. Proceeding of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), (4539-4534),
Paper
Published
Refereed?: Yes, Invited?: No

28. Lucia W, Famularo D, Furfaro A, Franzè G. (2018). Verification and Control of Hybrid Systems Under Safety Requirements. IFAC-PapersOnLine. IFAC Symposium on Robust Control Design (ROCOND), Florianópolis, Brazil (65-66),
Conference Date: 2018/9
Paper
Published
Refereed?: Yes, Invited?: No
29. Lucia W, Franze' G. (2017). Multi-vehicle formation control in uncertain environments. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), Melbourne, Australia (6580-6585),
Conference Date: 2017/12
Paper
Published
Refereed?: Yes, Invited?: No
30. Franzè G, Lucia W. (2016). A set-theoretic control architecture for constrained switching systems. Proceedings of the American Control Conference. American Control Conference (ACC), Boston, United States of America (685-690),
Conference Date: 2016/7
Paper
Published
Refereed?: Yes, Invited?: No
31. Lucia W, Sinopoli B, Franzè G. (2016). A set-theoretic approach for secure and resilient control of Cyber-Physical Systems subject to false data injection attacks. Cyber-Physical Systems Workshop (SOSCYPS), Science of Security for. Cyber-Physical Systems Week, Vienna, Austria (1-5),
Conference Date: 2016/4
Paper
Published
Refereed?: Yes, Invited?: No
32. Famularo D, Franzè G, Lucia W. (2016). Multiple stuck positions actuator faults: a model predictive based reconfigurable control scheme. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), Osaka, Japan (5091-5096),
Conference Date: 2015/12
Paper
Published
Refereed?: Yes, Invited?: No
33. Casavola A, Lucia W, Tedesco F. (2016). A networked-based MPC architecture for constrained LPV systems. Proceedings of IFAC-PapersOnLine. IFAC Workshop on Linear Parameter Varying Systems, Grenoble, France (158-163),
Conference Date: 2015/10
Paper
Published
Refereed?: Yes, Invited?: No
34. Franzè G, Lucia W, Tedesco F. (2015). A dwell-time based Command Governor approach for constrained switched systems. Proceedings of the American Control Conference. American Control Conference (ACC), Chicago, United States of America (1077-1082),
Conference Date: 2015/7
Paper
Published
Refereed?: Yes, Invited?: No

35. Lucia W, Sznaier M, Franzè G. (2015). An obstacle avoidance and motion planning command governor based scheme: the qball-x4 quadrotor case of study. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), Los Angeles, United States of America (6135-6140),
Conference Date: 2014/12
Paper
Published
Refereed?: Yes, Invited?: No
36. Franzè G, Lucia W, Tedesco F. (2014). A receding horizon scheme for discrete-time polytopic linear parameter varying systems in networked architectures. Journal of Physics: Conference Series. European Workshop on Advanced Control and Diagnosis, Berlin, Germany,
Conference Date: 2014/11
Paper
Published
Refereed?: Yes, Invited?: No
37. Franzè G, Lucia W, Tedesco F, Scordamaglia V. (2014). A distributed obstacle avoidance MPC strategy for leader-follower formations. IFAC Proceedings Volumes (IFAC-PapersOnline). World Congress of the International Federation of Automatic Control (IFAC), Cape Town, South Africa, Republic of (2570-2575),
Conference Date: 2014/8
Paper
Published
Refereed?: Yes, Invited?: No
38. G. Cotugno, W. D'Alfonso, L. and Lucia, P. Muraca, and P. Pugliese. (2013). Extended and unscented kalman filters for mobile robot localization and environment reconstruction. Proceeding of the Mediterranean Conference on Control and Automation. Mediterranean Conference on Control and Automation (MED), ,
Paper
Published
Refereed?: Yes, Invited?: No
39. G. Franze and W. Lucia. (2013). A model predictive control scheme for mobile robotic vehicles in dynamic environments. Proceeding of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), (1575-1582),
Paper
Published
Refereed?: Yes, Invited?: No
40. G. Franze, W. Lucia, and P. Muraca. (2013). An obstacle avoidance receding horizon control scheme for autonomous vehicles. Proceeding of the American Control Conference (ACC). American Control Conference (ACC), (3948-3953),
Paper
Published
Refereed?: Yes, Invited?: No
41. W. Lucia, G. Franze, and P. Muraca. (2013). An obstacle avoidance model predictive control scheme: A sum-of-squares approach. Mediterranean Conference on Control & Automation (MED). Mediterranean Conference on Control & Automation (MED), (1575-1582),
Paper
Published
Refereed?: Yes, Invited?: No

42. Famularo D, Franzè G, Lucia W. (2012). Networked control systems with state, input and communication constraints: A nonlinear approach. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), Maui, United States of America (38-43),
Conference Date: 2012/12
Paper
Published
Refereed?: Yes, Invited?: No
43. D'Alfonso L, Lucia W, Muraca P, Pugliese P. (2011). Filters for mobile robots: EKF, UKF and sensor switching-experimental results. IEEE International Conference on Control and Automation, ICCA. Conference on Control and Automation, Santiago, Chile (925-930),
Conference Date: 2011/12
Paper
Published
Refereed?: Yes, Invited?: No



Protected when completed

Date Submitted: 2024-02-14 13:57:02

Confirmation Number: 1741885

Template: NSERC_Researcher

Dr. Suryadipta Majumdar

Correspondence language: English

Contact Information

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Dr. Suryadipta Majumdar

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
Bengali	Yes	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	Yes	Yes

Degrees

- 2018/7 Doctorate, Information and Systems Engineering, Concordia University
Supervisors: Lingyu Wang, 2015/1 - 2018/7
- 2014/10 Master's Thesis, Information Systems Security, Concordia University
Supervisors: Mohammad Mannan, 2012/9 - 2014/9
- 2009/10 Bachelor's, Computer Science and Engineering, Bangladesh University of Engineering and Technology (BUET)

Recognitions

- 2023/7 Petro-Canada Young Innovator Award - 10,000
Concordia University
Prize / Award
The Petro-Canada Young Innovator Awards (PCYIA) recognize, promote, and support outstanding and innovative emerging researchers whose work contributes significantly to the training environment of the University and has an impact on society at large.
- 2023/1 - 2024/12 Gina Cody Research and Innovation Fellowship - 40,000
Concordia University
Prize / Award
The Gina Cody Research and Innovation Fellowships aim to support Gina Cody School professors undertaking collaborative research and innovation projects that have significant potential for meaningful partnership with industrial and government agencies.
- 2020/6 The Doctoral Prize in Engineering and Computer Science
Concordia University
Prize / Award
Awarded annually, when merited, to the most deserving graduate of the Doctor of/ Doctorate in Philosophy programs in the Gina Cody School of Engineering and Computer Science. Award is a plaque from the faculty.
- 2020/5 - 2022/4 University at Albany Faculty Research Award - 13,000
University at Albany
Prize / Award
University-wide research award

- 2019/5 Concordia Accelerator Award - 5,000
Concordia University
Prize / Award
This is awarded to the senior outstanding PhD candidates.
- 2018/2 - 2018/5 NSERC Canada Graduate Scholarships - Michael Smith Foreign Study Supplements (CGS-MSFSS) - 6,000
Natural Sciences and Engineering Research Council of Canada (NSERC)
Prize / Award
The Canada Graduate Scholarships – Michael Smith Foreign Study Supplements (CGS-MSFSS) support high-calibre Canadian graduate students in building global linkages and international networks through the pursuit of exceptional research experiences at research institutions abroad. By accessing international scientific research and training, CGS-MSFSS recipients will contribute to strengthening the potential for collaboration between Canadian and foreign institutions.
- 2017/5 - 2019/4 NSERC Alexander Graham Bell Canada Graduate Scholarship-Doctoral (CGS-D) - 70,000
Natural Sciences and Engineering Research Council of Canada (NSERC)
Prize / Award
The Alexander Graham Bell Canada Graduate Scholarship – Doctoral (CGS D) award is offered to the top-ranked applicants who are engaged in an eligible doctoral program in the natural sciences or engineering.
- 2017/5 - 2018/4 Fonds de Recherche du Québec - Nature et Technologies (FRQNT) B2 Scholarship - 20,000
Fonds de recherche du Québec - Nature et technologies (FRQNT)
Prize / Award
The purpose of Fonds de recherche du Québec – Nature et technologies (FRQNT) scholarship programs is to foster student interest in research and to financially assist the best candidates in undertaking or continuing a Master's or Doctoral's program in natural science, mathematics or engineering research. This award was declined by the candidate to hold the NSERC CGS-D award.

User Profile

Research Specialization Keywords: Cloud Computing Security, Cybersecurity, Internet of Things (IoT) Security, Proactive Security, Security Auditing

Employment

- 2023/6 Associate Professor
CIISE, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2020/8 - 2023/5 Assistant Professor
Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University
Full-time, Assistant Professor
Tenure Status: Tenure Track
- Conducting cybersecurity research; - Advising and training both undergraduate and graduate students; - Teaching both undergraduate and graduate courses on computer science and information security; - Serving in several department-level committees; - Organizing workshops and conferences on cybersecurity; - Serving in various conference technical program committee and reviewing journals.

2019/11 - 2020/7	Affiliated Professor Computer Science, Natural Sciences, Colorado State University Part-time Tenure Status: Non Tenure Track
2018/9 - 2020/7	Assistant Professor Information Security and Digital Forensics, Business, University at Albany - State University of New York Full-time, Assistant Professor Tenure Status: Tenure Track - Conducting cybersecurity research; - Advising and training both undergraduate and graduate students; - Teaching both undergraduate and graduate courses on computer science and information security; - Serving in several department-level and school-level committees; - Organizing workshops and conferences on cybersecurity; - Serving in various conference technical program committee and reviewing journals.
2012/9 - 2018/7	Research Assistant Concordia Institute for Information Systems Engineering, ENCS, Concordia University Part-time Tenure Status: Non Tenure Track Research
2013/9 - 2018/5	Teaching Assistant CIISE, ENCS, Concordia University Part-time, Sessional Tenure Status: Non Tenure Track Guest lectures, marking and programmer on duty
2010/6 - 2011/12	Software Engineer Mobile phone commercialization, Samsung R&D Center Software engineering

Research Funding History

Awarded [n=9]

2021/9 - 2026/8 Co-investigator	Security of Defence Products: Evaluations and Countermeasures, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) and Rheinmetall Canada Inc. Mitacs Accelerate Total Funding - 840,000 Portion of Funding Received - 210,000 Funding Competitive?: Yes Co-applicant : Frederic Cuppens; Mohsen Ghafouri; Nora Cuppens
2023/4 - 2026/3 Principal Investigator	Towards Actionable Security Guidelines for IoT Compliance Auditing and Integration with Trustworthiness, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Total Funding - 135,000 Portion of Funding Received - 135,000 Funding Competitive?: Yes Fonds de recherche du Québec - Nature et technologies (FRQNT) Total Funding - 90,000

Portion of Funding Received - 90,000

Funding Competitive?: Yes

Co-investigator : Lianying Zhao; Nadia Tawbi

2023/4 - 2026/3

Principal Investigator

Towards Actionable Security Guidelines for IoT Compliance Auditing and Integration with Trustworthiness, Grant

Funding Sources:

Fonds de recherche du Québec - Nature et technologies (FRQNT)

Total Funding - 36,298

Portion of Funding Received - 36,298

Funding Competitive?: Yes

2021/4 - 2026/3

Principal Investigator

Proactive Security Auditing against AI-enhanced Cyberthreats: from Clouds to Internet of Things (IoT), Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery

Total Funding - 125,000

Portion of Funding Received - 145,000

Funding Competitive?: Yes

2021/5 - 2024/4

Principal Applicant

Proactive Security Auditing against AI- enhanced Cyberthreats: from Clouds to Internet of Things (IoT), Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

DND/NSERC Discovery Grant Supplement

Total Funding - 120,000

Portion of Funding Received - 120,000

Funding Competitive?: Yes

2020/8 - 2022/4

Principal Investigator

Enabling Security Auditing for Internet of Things (IoT), Grant

Funding Sources:

Concordia University

Startup

Total Funding - 50,000

Portion of Funding Received - 50,000

Funding Competitive?: No

2021/4 - 2022/3

Principal Investigator

Proactive Security Auditing against AI-enhanced Cyberthreats: from Clouds to Internet of Things (IoT), Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery Launch Supplement

Total Funding - 12,500

Portion of Funding Received - 12,500

Funding Competitive?: Yes

2018/8 - 2021/7

Principal Investigator

IoT Security Research, Grant

Funding Sources:

University at Albany (State University of New York)

Startup

Total Funding - 39,000

Portion of Funding Received - 39,000

Funding Competitive?: No

2019/7 - 2020/6 Metering the Vulnerability of Diverse Players to Cyberattacks in Internet of Things (IoT),
Principal Investigator Grant

Funding Sources:

State University of New York (New York, USA)
IoT Research Germination Program
Total Funding - 8,500
Portion of Funding Received - 4,000
Funding Competitive?: Yes

Declined [n=1]

2021/4 - 2023/3 AI-Enhanced Security Auditing for Smart Home Networks: From Runtime to Proactive,
Principal Investigator Grant

Funding Sources:

Fonds de recherche du Québec - Nature et technologies (FRQNT)
Total Funding - 110,000
Portion of Funding Received - 0
Funding Competitive?: Yes

Student/Postdoctoral Supervision

Bachelor's [n=5]

2020/1 - 2020/5 Kayla E Ibrahim (Completed) , University at Albany - State University of New York
Principal Supervisor Thesis/Project Title: Towards Defining Actionable Security Rules for verifying IoT Security
Present Position: Student, University at Albany - State University of New York

2019/9 - 2020/5 Jimmy Kong (Completed) , University at Albany - State University of New York
Principal Supervisor Thesis/Project Title: Current Security Threats in Internet of Battle Things (IoBT)
Present Position: Student, University at Albany - State University of New York

2019/1 - 2019/5 Domenic Recchia (Completed) , University at Albany - State University of New York
Principal Supervisor Thesis/Project Title: Identifying potential security threats from IoT devices
Present Position: System Administrator, Setplex

2019/1 - 2020/5 Jivan Ramjisingh (Completed) , University at Albany - State University of New York
Principal Supervisor Thesis/Project Title: Cross-Device Security for IoT Sensors
Present Position: Cybersecurity Consultant, EY

2019/1 - 2019/5 Michael A Cahill (Completed) , University at Albany - State University of New York
Principal Supervisor Thesis/Project Title: Identifying Security-Critical Functionalities in Smart Home Devices
Present Position: Vulnerability Analyst, Department of Defense, USA

Master's Thesis [n=14]

2023/9 - 2025/8 Shafayat Hossain Majumder (In Progress) , Concordia University
Principal Supervisor Student Degree Expected Date: 2025/8
Thesis/Project Title: From Pre-deployment to Post-deployment Security Analysis on Containers
Present Position: Student

2023/9 - 2025/8 Principal Supervisor	Piyush Adhikari (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Security auditing of IoT devices in smart cities Present Position: Student
2023/9 - 2025/8 Principal Supervisor	Sourov Jajodia (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Automation of Cyber Tasks using Large Language Models Present Position: Student
2023/1 - 2024/12 Principal Supervisor	Mahdieh Ghorbanian, Concordia University Thesis/Project Title: Proactive security auditing in IoT Present Position: Student
2022/9 - 2023/12 Co-Supervisor	Jiawei Yao (Completed) , Concordia University Thesis/Project Title: Security recommendation framework for 5G networks Present Position: Student
2022/9 - 2024/8 Co-Supervisor	Alireza Toghyani (In Progress) , Concordia University Thesis/Project Title: Evaluating the usefulness of data augmentation in anomaly detection for IoT Present Position: Student
2022/5 - 2024/4 Principal Supervisor	Armin Mansouri, Concordia University Thesis/Project Title: Security monitoring framework for IoT Present Position: Student
2021/9 - 2023/8 Principal Supervisor	Sofya Smolyakova (In Progress) , Concordia University Student Degree Expected Date: 2023/8 Thesis/Project Title: Quantifying Cyber Risks in IoT Present Position: Student
2021/1 - 2023/9 Principal Supervisor	Shiva Sunar (Completed) , Concordia University Thesis/Project Title: IoT Sensor Failure Detection Present Position: Student
2020/9 - 2022/12 Co-Supervisor	Hugo Kermabon-Bobinnec (Completed) , Concordia University Thesis/Project Title: Proactive security auditing for containers in the cloud Present Position: PhD Student
2020/9 - 2023/8 Co-Supervisor	Mahmood Gholipour (Completed) , Concordia University Thesis/Project Title: Black-box security auditing for network functions virtualization (NFV) Present Position: Student
2020/9 - 2023/12 Co-Supervisor	Sima Bagheri (Completed) , Concordia University Thesis/Project Title: Proactive Security Mitigation for Containers Present Position: Student, Concordia University
2020/9 - 2023/5 Principal Supervisor	Md Wasiuddin Pathan Shuvo (Completed) , Concordia University Thesis/Project Title: Towards runtime security auditing of smart home networks Present Position: Student
2020/2 - 2020/5 Co-Supervisor	Andy Dolan (Completed) , Colorado State University Thesis/Project Title: Proactive Extraction of IoT Device Capabilities for Security Applications Present Position: Senior Security Engineer, CableLabs, USA

Doctorate [n=4]

- 2023/1 - 2026/12
Co-Supervisor Hugo Kermabon-Bobinnec, Concordia University
Thesis/Project Title: Devising proactive mitigation techniques in 5G networks
Present Position: PhD Student
- 2021/9 - 2024/8
Principal Supervisor Ehsan Khodayarsesht (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: Enabling IoT Forensics
Present Position: Student
- 2021/1 - 2024/12
Principal Supervisor Md. Nazmul Hoq (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Protecting against AI-Enhanced IoT Threats
Present Position: Student
- 2020/8 - 2023/8
Co-Supervisor A S M Asadujjaman (In Progress) , Concordia University
Student Degree Expected Date: 2023/8
Thesis/Project Title: Cross-Layer Security Verification for Network Functions Virtualization (NFV)
Present Position: Student

Event Administration

- 2021/11 - 2022/12 Mentor, Individualized Cybersecurity Research Mentoring (iMentor) Workshop 2021, Workshop, 2021/11 - 2021/11
- 2022/4 - 2022/9 Track Co-Chair, 19th Annual International Conference on Privacy, Security, and Trust (PST2022), Conference, 2022/8 - 2022/8
- 2021/12 - 2022/8 Program Co-Chair, 4th International Workshop on Cloud Security and Privacy (CLOUD S&P), Workshop, 2022/6 - 2022/6
- 2021/12 - 2021/12 Session Chair, The Third IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications, Conference, 2021/12 - 2021/12
- 2020/12 - 2021/8 Program Co-Chair, 3rd International Workshop on Cloud Security and Privacy (CLOUD S&P), Workshop, 2021/6 - 2021/6
- 2020/3 - 2021/6 Review Co-Chair, 15th Annual Symposium on Information Assurance (ASIA '20), Conference, 2021/6 - 2021/6
- 2021/2 - 2021/2 Session Chair, Seventeenth Annual IFIP WG 11.9 International Conference on Digital Forensics, Conference, 2021/2 - 2021/2
- 2020/1 - 2020/11 Program Co-Chair, 2nd International Workshop on Cloud Security and Privacy (CLOUD S&P), Workshop, 2020/10 - 2020/10
- 2019/1 - 2019/8 Program Co-Chair, 1st International Workshop on Cloud Security and Privacy (CLOUD S&P), Workshop, 2019/6 - 2019/6
- 2019/3 - 2019/6 Review Co-Chair, 14th Annual Symposium on Information Assurance (ASIA 2019), Conference, 2019/6 - 2019/6

Editorial Activities

- 2022/3 - 2025/4 Associate Editor, Peer-to-Peer Networking and Applications (Springer), Journal
- 2020/7 - 2021/6 Volume Editor, Innovations in Digital Forensics, Book

2020/7 - 2020/12 Guest Editor, IEEE Open Journal of the Communications Society (IEEE OJ-COMS), Journal

International Collaboration Activities

2023/1 - 2028/8 Research Collaborator, United States of America
Collaboration with SFSU

2020/9 - 2025/8 Research Collaborator, Bangladesh
Cybersecurity research with professors and students at Bangladesh University of Engineering and Technology

2022/1 - 2024/12 Research Collaborator, Saudi Arabia
Research on Security of Cloud Native Technologies with the Research Scientist, Resilient Computing and Cybersecurity Center, King Abdullah University of Science and Technology (KAUST)

2019/11 - 2023/8 Research Collaborator, United States of America
A research collaboration with a researcher at National Institute of Standards and Technology (NIST) on Internet of Things (IoT) security

2019/1 - 2023/8 Research Collaborator, United States of America
A research collaboration with a professor and her students at the Colorado State University on Internet of Things (IoT) security

2019/10 - 2023/7 Research Collaborator, Portugal
A research collaboration with a researcher at Bosch Security on Internet of Things (IoT) security

2019/9 - 2023/4 Research Collaborator, United States of America
A research collaboration with a professor at the Illinois Institute of Technology on cloud data privacy.

2019/1 - 2023/4 Research Collaborator, United States of America
A multi-disciplinary research with professors and students from the Psychology and Computer Science departments at the University at Albany.

2018/12 - 2023/4 Research Collaborator, United States of America
A research collaboration with a professor at Thomas Edison State University on moving target defense research for clouds

2020/1 - 2022/8 Research Collaborator, Spain
A research collaboration with a researcher at Telefonica on Software-Defined Network (SDN) security

Committee Memberships

2020/10 - 2021/4 Committee Member, Security Committee, Concordia University
Managing departmental security

2020/10 - 2021/4 Committee Member, Seminar Committee, Concordia University
Organizing research seminars

2020/10 - 2021/4 Committee Member, Supervision Committee, Concordia University
Dealing with the matters related to student supervision

2020/10 - 2021/4 Committee Member, Public Relations Committee, Concordia University
Advertising and maintaining department website

2020/6 - 2021/3	Committee Member, IEEE International Conference on Cyber-Security and Resilience (IEEE CSR 2021), IEEE Reviewing research papers for the conference
2019/11 - 2020/7	Committee Member, Technical Program Committee - IEEE COMPSAC Symposium on Security, Privacy and Trust in Computing (SEPT 2020), IEEE COMPSAC Reviewing research papers for the conference
2019/9 - 2020/7	Committee Member, Teaching and Learning Committee - School of Business, University at Albany - State University of New York
2019/12 - 2020/5	Committee Member, Technical Program Committee - 35th IFIP TC-11 SEC 2020 International Information Security and Privacy Conference, IFIP TC-11 Reviewing research papers for the conference
2019/8 - 2020/2	Committee Member, Technical Program Committee - International Conference on Information Systems Security and Privacy (ICISSP 2020), International Conference on Information Systems Security and Privacy (ICISSP 2020) Reviewing research papers for the conference
2019/5 - 2019/12	Committee Member, Technical Program Committee - Seventh International Symposium on Security in Computing and Communications (SSCC 2019), Seventh International Symposium on Security in Computing and Communications (SSCC 2019) Reviewing research papers for the conference
2019/2 - 2019/11	Committee Member, Technical Program Committee - 12th International Symposium on Foundations & Practice of Security (FPS 2019), 12th International Symposium on Foundations & Practice of Security (FPS 2019) Reviewing research papers for the conference
2019/1 - 2019/7	Committee Member, Technical Program Committee - IEEE Workshop on Security, Trust and Privacy for Software and Application (STPSA 2019), IEEE Reviewing research papers for the conference
2018/12 - 2019/7	Committee Member, Technical Program Committee - IEEE COMPSAC Symposium on Security, Privacy and Trust in Computing (SEPT 2019), IEEE COMPSAC Reviewing research papers for the conference
2019/1 - 2019/6	Committee Member, Technical Program Committee - 34th IFIP TC-11 SEC 2019 International Information Security and Privacy Conference (SEC 2019), IFIP TC-11 Reviewing research papers for the conference
2018/3 - 2018/11	Committee Member, Technical Program Committee - 11th International Symposium on Foundations & Practice of Security (FPS 2018), International Symposium on Foundations & Practice of Security Reviewing research papers for the conference

Other Memberships

2020/7	Journal Reviewer, IEEE Transactions on Cloud Computing (TCC) Reviewing research papers submitted to this journal for publication.
2020/1	Journal Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC) Reviewing research papers submitted to this journal for publication.
2019/12	Journal Reviewer, IEEE Internet of Things Journal Reviewing research papers submitted to this journal for publication.
2019/12	Journal Reviewer, ACM Transactions on Internet Technology (TOIT) Reviewing research papers submitted to this journal for publication

2019/12	Journal Reviewer, IEEE Transactions on Services Computing (TSC) Reviewing research papers submitted to this journal for publication
2019/7	Journal Reviewer, Journal of Cloud Computing Reviewing research papers submitted to this journal for publication
2018/9	Member, Institute of Electrical and Electronics Engineers (IEEE)
2018/5	Journal Reviewer, Elsevier Computer & Security Reviewing research papers submitted to this journal for publication
2017/7	Journal Reviewer, IET Information Security Reviewing research papers submitted to this journal for publication

Presentations

- (2022). Redefining Security Auditing at the Age of Cloud Computing. Distinguished Seminar, Padova, Italy
Invited?: Yes, Keynote?: No
- (2020). Proactive Security Auditing. Research Seminar, Montreal, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No
- (2020). Poster: Defining Actionable Rules for Verifying IoT Safety and Security. 41st IEEE Symposium on Security and Privacy (S&P 2020), San Fransisco, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
- (2019). Proactivizer: Transforming Existing Verification Tools into Efficient Solutions for Runtime Security Enforcement. 24th European Symposium on Research in Computer Security (ESORICS 2019), Luxembourg, Luxembourg
Main Audience: Researcher
Invited?: No, Keynote?: No
- (2019). Proactive Security Auditing for Clouds. Department of Computer Science at the Colorado State University Colloquium series, Fort Collins, United States of America
Main Audience: Researcher
Invited?: Yes, Keynote?: No
- (2019). Multi-Level Proactive Security Auditing for Cloud. IEEE Conference on Dependable and Secure Computing (DSC 2019), Hangzhou, China
Main Audience: Researcher
Invited?: Yes, Keynote?: No
- (2018). Proactive Security Auditing for Clouds. Research Seminar, Albany, United States of America
Main Audience: Researcher
Invited?: Yes, Keynote?: No
- (2018). Cloud Security Auditing: Major Approaches and Existing Challenges. 11th International Symposium on Foundations & Practice of Security (FPS 2018), Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No
- (2018). Stealthy Probing-based Verification (SPV): An Active Approach to Defending Software Defined Networks against Topology Poisoning Attacks. 23rd European Symposium on Research in Computer Security (ESORICS 2018), Barcelona, Spain
Main Audience: Researcher
Invited?: No, Keynote?: No

Broadcast Interviews

2019/04/02 - Expert comments on the ransomware attacks to the Albany City Hall, Local, CBS 6
2019/04/02

Text Interviews

2019/10/03 Digital Forensics Professor Coauthors Book on Improving Cloud Security Auditing,
University at Albany News Center

2019/09/17 Hacking the Smart Home via the Internet of Things, Communications of the ACM

Publications

Journal Articles

1. Momen Oqaily, Mohammad Ekramul Kabir, Suryadipta Majumdar, Yosr Jarraya, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang, and Mourad Debbabi. (2023). iCAT+: An Interactive Customizable Anonymization Tool Using Automated Translation Through Deep Learning. IEEE Transactions on Dependable and Secure Computing (TDSC).
Accepted
Refereed?: Yes
2. Sudershan Lakshmanan, Mengyuan Zhang, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi, Lingyu Wang. (2023). Caught-in-Translation (CiT): Detecting Cross-level Inconsistency Attacks in Network Functions Virtualization (NFV). IEEE Transactions on Dependable and Secure Computing (TDSC).
Accepted
Refereed?: Yes
3. Alaa Oqaily, Md Ekramul Kabir, Sudershan L T, Yosr Jarraya, Suryadipta Majumdar, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang, Mourad Debbabi. (2022). Automatically Verifying the Security of Multilevel Network Functions Virtualization (NFV) Stack. IEEE Transactions on Dependable and Secure Computing (TDSC).
Submitted
Refereed?: Yes
4. Suryadipta Majumdar, Gagandeep Singh Chawla, Yosr Jarrya, Taous Madi, Amir Alimohammadifar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2022). ProSAS: Proactive Security Auditing System for Clouds. IEEE Transactions on Dependable and Secure Computing (TDSC). 19(4)
Published
Refereed?: Yes
5. Gagandeep Singh Chawla, Mengyuan Zhang, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2021). VMGuard: State-based Proactive Verification of Virtual Network Isolation. IEEE Transactions on Dependable and Secure Computing (TDSC). 18(4): 1553 - 1567.
Accepted
Refereed?: Yes, Open Access?: No
6. Momen Oqaily, Yosr Jarraya, Meisam Mohammady, Suryadipta Majumdar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2020). SegGuard: Segmentation-based Anonymization of Network Data in Clouds for Privacy-Preserving Security Auditing. IEEE Transactions on Dependable and Secure Computing (TDSC).
Accepted
Refereed?: Yes, Open Access?: No

7. Lin Zhu, Suryadipta Majumdar, Chinwe Ekenna. (2020). An Invisible Warfare with the Internet of Battlefield Things (IoBT): A Literature Review. Human Behavior and Emerging Technologies. Accepted
Refereed?: Yes
8. Suryadipta Majumdar. (2020). A Multi-Level Proactive Security Auditing Framework for Clouds through Automated Dependency Building. CCF Transactions on Networking. 3(2): 112-127.
Published
Refereed?: Yes, Open Access?: No
9. Suryadipta Majumdar, Azadeh Tabiban, Yosr Jarraya, Momen Oqaily, Amir Alimohammadifar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Learning Probabilistic Dependencies among Events for Proactive Security Auditing in Clouds. Journal of Computer Security (JCS). 27(2): 165-202.
Published
Refereed?: Yes, Open Access?: Yes
10. Taous Madi, Yosr Jarraya, Amir Alimohammadifar, Suryadipta Majumdar, Yushun Wang, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). ISOTOP: Auditing Virtual Networks Isolation Across Cloud Layers in OpenStack. ACM Transactions on Privacy and Security (TOPS). 22(1): 1:1-1:35.
Published
Refereed?: Yes, Open Access?: No
11. Suryadipta Majumdar, Taous Madi, Yushun Wang, Yosr Jarrya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). User-level Runtime Security Auditing for Clouds. IEEE Transactions on Information Forensics and Security (TIFS). 13(5): 1185-1199.
Published
Refereed?: Yes, Open Access?: No

Books

1. Suryadipta Majumdar Habib Louafi Sankardas Roy Elias Bou-Harb Andrew Meyer Kurt Friday Lingyu Wang. (2023). Innovations in Digital Forensics. (2): 344. Suryadipta Majumdar Paria Shirani Lingyu Wang. Published, World Scientific Publishing
Refereed?: Yes
2. Jianying Zhou, Chuadhry Mujeeb Ahmed, Lejla Batina, Sudipta Chattopadhyay, Olga Gadyatskaya, Chenglu Jin, Jingqiang Lin, Eleonora Losiouk, Bo Luo, Suryadipta Majumdar, Mihalis Maniatakos, Daisuke Mash. (2021). Applied Cryptography and Network Security Workshops: ACNS 2021 Satellite Workshops, AIBlock, AIHWS, AIoTS, CIMSS, Cloud S&P, SCI, SecMT, and SiMLA, Kamakura, Japan, June 21--24, 2021, Proceedings. (12809)
Published, Springer
Refereed?: Yes
3. Jianying ZhouMauro ContiChuadhry Mujeeb AhmedMan Ho AuLejla BatinaZhou LiJingqiang LinEleonora LosioukBo LuoSuryadipta MajumdarWeizhi MengMartín OchoaStjepan PicekGeorgios PortokalidisCong WangKehuan Zhang. (2020). Applied Cryptography and Network Security Workshops: ACNS 2020 Satellite Workshops, AIBlock, AIHWS, AIoTS, Cloud S&P, SCI, SecMT, and SiMLA, Rome, Italy, October 19--22, 2020, Proceedings. LNCS(12418)
Published, Springer
Refereed?: Yes
4. Suryadipta Majumdar, Taous Madi, Yushun Wang, Azadeh Tabiban, Momen Oqaily, Amir Alimohammadifar, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). [B1] Cloud Security Auditing. 1(76)
Published, Springer International Publishing
Refereed?: No

5. Jianying Zhou, Robert H. Deng, Zhou Li, Suryadipta Majumdar, Weizhi Meng, Lingyu Wang, Kehuan Zhang. (2019). Applied Cryptography and Network Security Workshops - ACNS 2019 Satellite Workshops, SiMLA, Cloud S&P, AIBlock, and AIoTS, Bogota, Colombia, June 5-7, 2019, Proceedings. LNCS(11605) Published, Springer
Refereed?: Yes

Conference Publications

1. Hugo Kermabon-Bobindec, Yosr Jarraya, Lingyu Wang, Suryadipta Majumdar and Makan Pourzandi. (2024). Phoenix: Surviving Unpatched Vulnerabilities via Accurate and Efficient Filtering of Syscall Sequences. ISOC. Network and Distributed System Security Symposium (NDSS 2024), Paper
Accepted
Refereed?: Yes, Invited?: No
2. Madeena Sultana, Adrian A Taylor, Li Li, Suryadipta Majumdar. (2023). Towards Evaluation and Understanding of Large Language Models for Cyber Operation Automation. Cyber Resilience Workshop (CRW) at IEEE CNS 2023, Paper
Accepted
Refereed?: Yes, Invited?: No
3. Md Wasiuddin Pathan Shuvo, Md Nazmul Hoq, Suryadipta Majumdar, Paria Shirani. (2023). On Reducing Underutilization of Security Standards by Deriving Actionable Rules: An Application to IoT. 8th Security Standardisation Research (SSR) Conference, Paper
Published
Refereed?: Yes, Invited?: No
4. Sima Bagheri, Hugo Kermabon-Bobindec, Suryadipta Majumdar, Yosr Jarraya, Lingyu Wang, Makan Pourzandi. (2023). Warping the Defence Timeline: Non-disruptive Proactive Attack Mitigation for Kubernetes Clusters. IEEE International Conference on Communications (ICC 2023), Paper
Published
Refereed?: Yes, Invited?: No
5. Md Nazmul Hoq, Jia Wei Yao, Suryadipta Majumdar, Luis Suárez, Lingyu Wang, Makan Pourzandi, Amine Boukhtouta, Mourad Debbabi. (2023). Evaluating the Security Posture of 5G Networks by Combining State Auditing and Event Monitoring. 28th European Symposium on Research in Computer Security (ESORICS), Paper
Accepted
Refereed?: Yes, Invited?: No
6. Momen Oqaily, Suryadipta Majumdar, Lingyu Wang, Mohammad Ekramul Kabir, Yosr Jarraya, A S M Asadujjaman, Makan Pourzandi, Mourad Debbabi. (2023). A Tenant-based Two-stage Approach to Auditing the Integrity of Virtual Network Function Chains Hosted on Third-Party Clouds. 13th ACM Conference on Data and Application Security and Privacy (CODASPY), Paper
Accepted
Refereed?: Yes, Invited?: No
7. Shafayat Hossain Majumder, Sourov Jajodia, Suryadipta Majumdar, Md. Shohrab Hossain. (2023). Layered Security Analysis for Container Images: Expanding Lightweight Pre-Deployment Scanning. 20th International Conference on Privacy, Security, and Trust (PST), Paper
Accepted
Refereed?: Yes, Invited?: No

8. Shafayat Hossain Majumder, Sourov Jajodia, Suryadipta Majumdar, Md. Shohrab Hossain. (2023). Layered Security Analysis for Container Images: Expanding Lightweight Pre-Deployment Scanning. 20th International Conference on Privacy, Security, and Trust (PST), Copenhagen, Denmark
Conference Date: 2023/8
Paper
In Press
Refereed?: Yes, Invited?: No
9. A S M Asadujjaman, Mohammad Ekramul Kabir, Hinddeep Purohit, Suryadipta Majumdar, Lingyu Wang, Yosr Jarraya, Makan Pourzandi. (2022). 5GFIVer: Functional Integrity Verification for 5G Cloud-Native Network Functions. 13th IEEE International Conference on Cloud Computing Technology and Science (CloudCom),
Paper
Published
Refereed?: Yes, Invited?: No
10. Hugo Kermabon-Bobinnec, Mahmood Gholipourchoubeh, Sima Bagheri, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi and Lingyu Wang. (2022). ProSPEC: Proactive Security Policy Enforcement for Containers. 12th ACM Conference on Data and Application Security and Privacy (CODASPY),
Paper
Accepted
Refereed?: Yes, Invited?: No
11. Alaa Oqaily, Yosr Jarraya, Lingyu Wang, Makan Pourzandi, Suryadipta Majumdar. (2022). MLFM: Machine Learning Meets Formal Method for Efficient Security Verification in Network Functions Virtualization (NFV). The 27th European Symposium on Research in Computer Security (ESORICS) 2022, Copenhagen, Denmark
Conference Date: 2022/9
Paper
Accepted
Refereed?: Yes, Invited?: No
12. Tania Tahmina Jui, Md. Nazmul Hoq, Suryadipta Majumdar and Md. Shohrab Hossain. (2021). Feature Reduction through Data Pre-Processing for Intrusion Detection in IoT Networks. Third IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications (TPS),
Conference Date: 2021/12
Paper
Accepted
Refereed?: Yes, Invited?: No
13. Arunavo Dey, Md. Shohrab Hossain, Md. Nazmul Hoq, and Suryadipta Majumdar. (2021). Towards an Attention-based Accurate Intrusion Detection Approach. 17th EAI International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (QSHINE),
Conference Date: 2021/11
Paper
Accepted
Refereed?: Yes, Invited?: No
14. Upakar Paudel, Andy Dolan, Suryadipta Majumdar and Indrakshi Ray. (2021). Context-Aware IoT Device Functionality Extraction from Specifications for Ensuring Consumer Security. 9th IEEE Conference on Communications and Network Security (CNS 2021),
Conference Date: 2021/10
Paper
Accepted
Refereed?: Yes, Invited?: No

15. A S M Asadujjaman, Momen Oqaily, Yosr Jarraya, Suryadipta Majumdar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2021). Artificial Packet-Pair Dispersion (APPD): A Blackbox Approach to Verifying the Integrity of NFV Service Chains. 9th IEEE Conference on Communications and Network Security (CNS 2021),
Conference Date: 2021/10
Paper
Accepted
Refereed?: Yes, Invited?: No
16. Suryadipta Majumdar, Daniel Bastos and Anoop Singhal. (2021). From High-Level Security Recommendations to Low-Level Actionable Rules to Enable Security Auditing of Smart Home Devices. 17th IFIP WG 11.9 International Conference on Digital Forensics,
Conference Date: 2021/2
Paper
Accepted
Refereed?: Yes, Invited?: No
17. Alaa Oqaily, Sudershan Lakshmanan, Yosr Jarraya, Suryadipta Majumdar, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2020). NFVGuard : Verifying the Security of Multilevel Network Functions Virtualization (NFV) Stack. 12th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2020), Bangkok, Thailand
Conference Date: 2020/12
Paper
Accepted
Refereed?: Yes, Invited?: No
18. Andy Dolan, Indrakshi Ray and Suryadipta Majumdar. (2020). Proactively Extracting IoT Device Capabilities: An Application to Smart Homes. Springer. 34th Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSec 2020), Regensburg, Germany (42-63)
Conference Date: 2020/6
Paper
Published
Refereed?: Yes, Invited?: No
19. Kayla E Ibrahim, Suryadipta Majumdar, Daniel Bastos and Anoop Singhal. (2020). Defining Actionable Rules for Verifying IoT Safety and Security. IEEE. 41st IEEE Symposium on Security and Privacy (S&P 2020), San Fransisco, United States of America
Conference Date: 2020/5
Poster
Published
Refereed?: Yes, Invited?: No
20. Suryadipta Majumdar, Azadeh Tabiban, Meisam Mohammady, Alaa Oqaily, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Multi-Level Proactive Security Auditing for Cloud. IEEE. IEEE Conference on Dependable and Secure Computing (DSC), Hangzhou, China
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: Yes

21. Suryadipta Majumdar, Azadeh Tabiban, Meisam Mohammady, Alaa Oqaily, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Proactivizer: Transforming Existing Verification Tools into Efficient Solutions for Runtime Security Enforcement. Springer. 24th European Symposium on Research in Computer Security (ESORICS 2019), Luxembourg, Luxembourg (239-262)
Conference Date: 2019/9
Paper
Published
Refereed?: Yes, Invited?: No
22. Suryadipta Majumdar, Taous Madi, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). Cloud Security Auditing: Major Approaches and Existing Challenges. Springer International Publishing. 11th International Symposium on Foundations & Practice of Security (FPS 2018), Montreal, Canada
Conference Date: 2018/11
Paper
Published
Refereed?: Yes, Invited?: No
23. Amir Alimohammadifar, Suryadipta Majumdar, Taous Madi, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). Stealthy Probing-based Verification (SPV): An Active Approach to Defending Software Defined Networks against Topology Poisoning Attacks. Springer International Publishing. 23rd European Symposium on Research in Computer Security (ESORICS 2018), Barcelona, Spain (463-484)
Conference Date: 2018/9
Paper
Published
Refereed?: Yes, Invited?: No
24. Abu Asadujjaman, Elisa Rojas, Mohammad Shah Alam and Suryadipta Majumdar. (2018). Fast Control Channel Recovery for Resilient In-band OpenFlow Networks. IEEE. 4th IEEE International Conference on Network Softwarization (NetSoft 2018), Montreal, Canada
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
25. Azadeh Tabiban, Suryadipta Majumdar, Lingyu Wang and Mourad Debbabi. (2018). PERMON: An OpenStack Middleware for Runtime Security Policy Enforcement in Clouds. IEEE. 4th IEEE Workshop on Security and Privacy in the Cloud (SPC 2018), Beijing, China
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Patents

1. Measuring Security Posture using Combined-Graphs. United States of America. P107379.
Patent Status: Pending
Inventors: Md Nazmul Hoq, Jia Wei Yao, Luis Suárez, Lingyu Wang, Suryadipta Majumdar, Amine Boukhtouta, Makan Pourzandi, Mourad Debbabi

2. Dynamic System Calls-Level Security Defensive System for Containerized ApplicationsHugo Kermabon-Bobinnec, Mahmood Gholipourchoubeh, Sima Bagheri, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi and Lingyu Wang. United States of America. P105751US01.
Patent Status: Pending
Inventors: Hugo Kermabon-Bobinnec, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi and Lingyu Wang
3. DPOD: Differentially Private Outsourcing of Anomaly Detection. United States of America. P080915WO01. 2020/07/15.
Patent Status: Pending
Inventors: Meisam Mohammady, Suryadipta Majumdar, Yuan Hong, Lingyu Wang, Yosr Jarraya, Makan Pourzandi, Mourad Debbabi, Mengyuan Zhang, Han Wang

Date Submitted: 2024-02-02 16:54:19

Confirmation Number: 1737828

Template: Full CV

Professor Mohammad Mannan

Correspondence language: English

Sex: Male

Date of Birth: 10/10

Canadian Residency Status: Canadian Citizen

Country of Citizenship: Canada

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The primary information is denoted by (*)

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Website

Personal <https://users.encs.concordia.ca/~mmannan>

Professor Mohammad Mannan

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes

Degrees

2005/9 - 2009/4	<p>Doctorate, Ph.D. in Computer Science, Computer Science, Carleton University Degree Status: Completed Thesis Title: Authentication and Securing Personal Information in an Untrusted Internet Transferred to PhD without completing Masters?: No Supervisors: Van Oorschot, Paul, 2005/9 - 2009/4 Research Disciplines: Computer Science Areas of Research: Computer Systems Fields of Application: Security</p>
2003/9 - 2005/8	<p>Master's Thesis, Master of Computer Science, Computer Science, Carleton University Degree Status: Completed Thesis Title: Secure Public Instant Messaging Supervisors: Van Oorschot, Paul, 2003/9 - 2005/8 Research Disciplines: Computer Science Areas of Research: Computer Systems Fields of Application: Security</p>
1995/1 - 2000/6	<p>Bachelor's, B.Sc. in Computer Science and Engineering, Computer Science and Engineering, Bangladesh University of Engineering and Technology Degree Status: Completed Thesis Title: A Study on Data Compression Algorithms Supervisors: Kaykobad, Mohammad, 1999/6 - 2000/6</p>

Credentials

2013/4	Professional Engineer, Professional Engineers of Ontario (PEO)
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Recognitions

- 2022/6 Distinguished Paper Award Finalists
IEEE EuroS&P 2022
Distinction
Awarded at the IEEE European Symposium on Security and Privacy (IEEE EuroS&P 2022). The work was done by MASc student *Elgharabawy, M and collaborators from University of Florida.
- 2020/12 Distinguished Paper Award
ACSAC
Distinction
Awarded at the 36th Annual Computer Security Applications Conference (ACSAC 2020) - one of the four Distinguished Papers. The work was done by MASc students *Ali, S, *Elgharabawy, M, and *Duchaussoy, Q.
- 2019/7 Concordia Newsmaker-of-the-week (July/2019)
Concordia University
Distinction
Newsmaker of the Week: "the Concordian or Concordians who've made the greatest media impact based on news outlet prestige and scope of audience."
- 2018/10 Recognition of Service Award from the ACM SIG Governing Board
The Association for Computing Machinery (ACM)
Honor
Awarded for being the Co-Chair (General) of 2018 ACM SIGSAC Conference on Computer and Communications Security (CCS'18).
- 2017/12 Best Paper Award
STAST/ACSAC
Distinction
Awarded at the 7th Workshop on Socio-Technical Aspects in Security and Trust (STAST, co-located with ACSAC 2017). The work was done by MASc students *Mahmoud, M, *Hossen, M, and Barakat, H.
- 2017/5 - 2017/6 Erasmus Mundus NordSecMob Scholar - 5,000 (Euro)
Aalto University, Finland
Prize / Award
Erasmus Mundus is a co-operation and mobility programme, promoting the European Union (EU) as a centre of excellence in higher education. I was selected to guide a few Master's students under this program (mostly at Aalto University).
- 2016/12 Concordia Newsmaker-of-the-week (Dec/2016) (Canadian dollar)
Concordia University
Distinction
Newsmaker of the Week: "the Concordian or Concordians who've made the greatest media impact based on news outlet prestige and scope of audience." Link: <https://www.concordia.ca/news/concordia-in-the-news/newsmakers/cunews/main/items/2016/12/5/newsmaker.html>
- 2016/5 Concordia Newsmaker-of-the-week (May/2016)
Concordia University
Distinction
Newsmaker of the Week: "the Concordian or Concordians who've made the greatest media impact based on news outlet prestige and scope of audience." Link: <http://www.concordia.ca/cunews/main/items/2016/05/09/newsmaker.html>

- 2015/10 Recognition of "Outstanding Service" as the Local Arrangement Chair for an IEEE conference.
IEEE
Honor
Awarded for being the Local Arrangement Chair of IEEE 34th Symposium on Reliable Distributed Systems (SRDS).
- 2015/3 Concordia Newsmaker-of-the-week (March/2015)
Concordia University
Distinction
Link: <http://www.concordia.ca/news/concordia-in-the-news/news/concordia-in-the-news/newsmakers/cunews/main/items/2015/03/27/MohammadMannan.html>
- 2014/5 - 2014/7 Spotlight paper of IEEE Transactions on Dependable and Secure Computing (TDSC) at the TDSC portal: <http://www.computer.org/portal/web/tdsc> (Canadian dollar)
IEEE Computer Society
Distinction
Our paper was accepted for a special TDSC issue on mobile security, and it was selected as the spotlight paper for two months (May/June 2014).

User Profile

Researcher Status: Researcher

Research Specialization Keywords: Authentication, Malware and binary analysis, Mobile device security and privacy, Operating Systems security, Privacy analysis frameworks, Trusted computing, Usable security

Disciplines Trained In: Computer Science, Computer Engineering and Software Engineering

Research Disciplines: Computer Science

Areas of Research: Computer Systems, Information Systems, Software Development

Fields of Application: Security

Employment

- 2023/6 Professor
Concordia Institute for Information Systems Engineering, Concordia University
Full-time, Professor
Tenure Status: Tenure
- 2016/5 Fellow
TandemLaunch Inc. (Montreal, Canada)
Technology consultant at TandemLaunch Inc., a venture capital & private equity company based in Montreal, Canada. My contract is for occasional evaluation of new technology proposals received by TandemLaunch. This work has no direct relationship with my research program.
- 2016/6 - 2023/5 Associate Professor
Concordia Institute for Information Systems Engineering (CIISE), Engineering and Computer Science, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure

2018/3 - 2018/4	Visiting Professor Cyber Physical Security Research Center, The National Institute of Advanced Industrial Science and Technology (AIST), Japan Full-time, Visiting Professorship Tenure Status: Non Tenure Track
2018/2 - 2018/3	Visiting Professor Computer Science, University of Waterloo Full-time, Visiting Professorship Tenure Status: Non Tenure Track
2018/1 - 2018/2	Visiting Professor Electrical and Computer Engineering, University of Toronto Full-time, Visiting Professorship Tenure Status: Non Tenure Track
2017/9 - 2017/12	Visiting Professor Computer Science, ETH Zurich, Switzerland Full-time, Visiting Professorship Tenure Status: Non Tenure Track
2017/5 - 2017/6	Visiting Professor Computer Science, Espoo, Aalto University, Finland Full-time, Visiting Professorship Tenure Status: Non Tenure Track
2011/7 - 2016/5	Assistant Professor Concordia Institute for Information Systems Engineering (CIISE), Engineering and Computer Science, Concordia University Full-time, Assistant Professor Tenure Status: Tenure Track
2009/7 - 2011/6	NSERC/ISSNet Post-doctoral Fellow Electrical and Computer Engineering, University of Toronto Full-time Tenure Status: Non Tenure Track
2009/5 - 2009/6	Post-doctoral Research Associate Computer Science, Carleton University Full-time Tenure Status: Non Tenure Track
2001/6 - 2003/9	Software Developer Research and Development, Eyeball Networks Inc. (Vancouver, Canada)
2000/8 - 2001/5	Software Developer Software, TigerIT Inc. (Dhaka, Bangladesh)
1997/1 - 2000/7	Instructor Educational and training services, IBCS-Primax Software (BD) Ltd., Dhaka, Bangladesh Part-time Tenure Status: Non Tenure Track

Affiliations

The primary affiliation is denoted by (*)

(*) 2011/7 Assistant Professor, Concordia Institute for Information Systems Engineering (CIISE),
Concordia University

Research Funding History

Awarded [n=4]

2023/8 - 2024/3 Privacy Analysis of VR/AR Online Shopping Applications, Grant

Principal Investigator

Funding Sources:

Office of the Privacy Commissioner of Canada
Contributions Program
Total Funding - 35,450
Portion of Funding Received - 35,450
Funding Competitive?: Yes

Co-investigator : Amr Youssef

2019/9 - 2023/12 Cross Layer Security Mechanisms: From Design to Integration within Ultra-Dense

Principal Investigator Virtualized Radio Access Net, Grant

Funding Sources:

Ericsson Research Canada
Mitacs Accelerate Cluster
Total Funding - 146,666
Portion of Funding Received - 80,000
Funding Competitive?: Yes

2017/5 - 2023/4 Data Security through Trusted Execution and Comprehensive Analysis Framework, Grant,
Principal Investigator Operating

Funding Sources:

2017/5 - 2022/4 Natural Sciences and Engineering Research Council of Canada
(NSERC)
Discovery Grant
Total Funding - 138,000 (Canadian dollar)
Portion of Funding Received - 138,000
Funding Competitive?: Yes

2022/6 - 2023/3 Privacy Analysis of Technologies Used in Intimate Partner Abuse, Grant

Principal Investigator

Funding Sources:

Office of the Privacy Commissioner of Canada
Contributions Program
Total Funding - 26,716
Portion of Funding Received - 13,358
Funding Competitive?: Yes

Co-investigator : Amr Youssef

Completed [n=17]

2021/5 - 2022/3 Privacy Report Card for Online Solutions Targeting Seniors, Grant

Principal Investigator

Funding Sources:

Office of the Privacy Commissioner of Canada
Contributions Program
Total Funding - 49,740
Portion of Funding Received - 24,870
Funding Competitive?: Yes

Co-investigator : Amr Youssef

- 2020/5 - 2021/8
Principal Investigator
- Detecting Advanced Phishing and Malicious Websites, Grant
- Funding Sources:**
- Canadian Internet Registration Authority
 - Community Investment Program
 - Total Funding - 45,500
 - Portion of Funding Received - 22,750
 - Funding Competitive?: Yes
- Co-investigator : Amr Youssef
- 2018/9 - 2019/10
Principal Investigator
- Safety and Security for Connected and Autonomous Vehicles, Grant
- Funding Sources:**
- Irdeto Canada
 - Mitacs Accelerate Cluster
 - Total Funding - 40,000
 - Portion of Funding Received - 40,000
 - Funding Competitive?: Yes
- 2018/5 - 2019/4
Principal Investigator
- A Global View on Web Tracking and TLS Anomalies, Grant
- Funding Sources:**
- Canadian Internet Registration Authority
 - Community Investment Program
 - Total Funding - 43,150
 - Portion of Funding Received - 21,575
 - Funding Competitive?: Yes
- Co-investigator : Amr Youssef
- 2018/4 - 2019/3
Principal Investigator
- Privacy Leakage in Canadian Public Wi-Fi Networks, Grant
- Funding Sources:**
- Office of the Privacy Commissioner of Canada
 - Contributions Program
 - Total Funding - 58,391
 - Portion of Funding Received - 29,195
 - Funding Competitive?: Yes
- Co-investigator : Amr Youssef
- 2014/6 - 2017/5
Principal Investigator
- ARRE Project on Speaker Series and Workshop in Security, Grant, Workshop
- Funding Sources:**
- 2014/6 - 2017/5 Concordia University
 - Aid to Research Related Events, Publication, Exhibition and Dissemination Activities
 - Total Funding - 5,000 (Canadian dollar)
 - Portion of Funding Received - 5,000
 - Funding Competitive?: Yes
- 2012/5 - 2017/4
Principal Investigator
- Security and Privacy of High Impact Computer Applications, Grant, Operating
- Project Description: The proposed research focuses on three goals: (a) leverage existing and newly introduced hard- ware security features to enhance the foundation of low-level system software layers to better sup- port security-critical applications; (b) design privacy-preserving architectures and techniques given that users will continue exchanging data through cloud-based services; (c) deal with the "unmotivated user" problem by integrating security/privacy mechanisms with the functioning of the system itself. Overall,

the proposed research addresses important privacy concerns of today's digital citizens, offers high-assurance techniques for businesses and government agencies, and helps increase trustworthiness of computing systems.

Funding Sources:

2012/5 - 2017/4 Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery Grant
Total Funding - 110,000 (Canadian dollar)
Portion of Funding Received - 110,000 (Canadian dollar)
Funding Competitive?: Yes

Funding by Year:

2012/4 - 2017/4 Total Funding - 110,000
Portion of Funding Received - 44,000
Time Commitment: 25

2016/4 - 2017/3 Privacy Report Card for Children's Smart Toys, Grant, Operating
Principal Investigator

Funding Sources:

2017/4 - 2018/3 Office of the Privacy Commissioner of Canada
Contributions Program
Total Funding - 49,767 (Canadian dollar)
Portion of Funding Received - 24,883
Funding Competitive?: Yes

Co-investigator : Amr Youssef

2016/6 - 2016/9 WebAssembly Evaluation for Software Protection, Grant
Principal Investigator

Funding Sources:

2016/6 - 2016/9 Mathematics of Information Technology and Complex Systems (MITACS)
Mitacs Accelerate Program (Irdeto Canada)
Total Funding - 15,000 (Canadian dollar)
Portion of Funding Received - 15,000
Funding Competitive?: Yes

2013/8 - 2016/7 Software Fingerprinting for Automated Malicious Code Analysis, Grant, Operating
Co-investigator

Funding Sources:

2013/8 - 2016/7 Natural Sciences and Engineering Research Council of Canada (NSERC)
DND/NSERC Research Partnership Project (DNDPJ)
Total Funding - 641,739 (Canadian dollar)
Portion of Funding Received - 54,243
Funding Competitive?: Yes

Funding by Year:

2013/8 - 2016/7 Total Funding - 641,739
Portion of Funding Received - 16,000
Time Commitment: 20

Co-investigator : Amr Youssef; Benjamin Fung; Lingyu Wang;

Principal Investigator : Mourad Debbabi

2015/12 - 2016/5 Analysis of Linux Container-based Security Mechanisms, Grant
Principal Investigator

Funding Sources:

2015/12 - 2016/5 Natural Sciences and Engineering Research Council of Canada (NSERC)
 NSERC Engage Grant (Huawei Canada)
 Total Funding - 25,000 (Canadian dollar)
 Portion of Funding Received - 25,000
 Funding Competitive?: Yes

2015/4 - 2016/3
 Co-investigator

Certificate Authority Report Card: Examining the Root of Data Protection on the Web, Grant

Funding Sources:

2015/4 - 2016/3 Office of the Privacy Commissioner of Canada
 Contributions Program
 Total Funding - 49,225 (Canadian dollar)
 Portion of Funding Received - 13,000
 Funding Competitive?: Yes

Principal Investigator : Jeremy Clark

2013/4 - 2015/3
 Principal Investigator

Data Security and Privacy in Mobile Devices, Grant, Operating
 Clinical Research Project?: No

Project Description: To restrict unwanted access, all major mobile OS manufacturers include some level of storage encryption. However, encrypting user data may be inadequate in situations where users may be coerced into disclosing their decryption keys. Deniable encryption techniques have been devised to address this specific problem in the desktop environment. We argue that deniable storage encryption is more important for mobile devices as these devices are more widely used and portable than laptops or desktops. Another avenue for data leakage is through the use of mobile applications (apps), requiring access to privacy-sensitive system resources, e.g., camera, microphone, and GPS; these apps may leak information to third parties while the user remains unaware. The proposed research focuses on: (a) design and implement a deniable storage encryption system that can address challenges specific to m

Funding Sources:

2013/4 - 2015/3 Fonds de recherche du Québec - Nature et technologies (FRQNT)
 New researchers start up program
 Total Funding - 45,286 (Canadian dollar)
 Portion of Funding Received - 45,286 (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

Funding by Year:

2013/4 - 2015/4 Total Funding - 40,000 (Canadian dollar)
 Portion of Funding Received - 20,000 (Canadian dollar)
 Time Commitment: 20

2013/4 - 2015/4 Total Funding - 5,286 (Canadian dollar)
 Portion of Funding Received - 5,286 (Canadian dollar)
 Time Commitment: 0

2011/7 - 2014/4
 Principal Investigator

Securing User-to-User Authentication in IM/Web Applications, Grant

Funding Sources:

2011/7 - 2014/4 Concordia University
 Start-up Funds (ENCS)
 Total Funding - 50,000 (Canadian dollar)
 Portion of Funding Received - 50,000
 Funding Competitive?: No

Funding by Year:

2011/7 - 2014/4 Total Funding - 50,000
 Portion of Funding Received - 50,000
 Time Commitment: 25

2012/9 - 2013/2 Network Security in the Age of Smartphone Malware, Grant, Operating
 Principal Investigator

Funding Sources:

2012/9 - 2013/2 Natural Sciences and Engineering Research Council of Canada
 (NSERC)
 NSERC Engage Program (Irdeto Canada)
 Total Funding - 24,200 (Canadian dollar)
 Portion of Funding Received - 24,200
 Funding Competitive?: Yes

Funding by Year:

2012/9 - 2013/2 Total Funding - 24,200
 Portion of Funding Received - 24,200
 Time Commitment: 20

2009/7 - 2011/6 NSERC ISSNet Postdoctoral Fellowship, Fellowship
 Principal Applicant

Funding Sources:

2009/7 - 2011/6 NSERC ISSNet
 Postdoctoral Fellowship
 Total Funding - 74,500 (Canadian dollar)
 Portion of Funding Received - 74,500 (Canadian dollar)
 Funding Competitive?: Yes

2010/5 - 2011/6 NSERC Postdoctoral Fellowship, Fellowship
 Principal Applicant

Funding Sources:

2010/5 - 2011/6 Natural Sciences and Engineering Research Council of Canada
 (NSERC)
 Postdoctoral Fellowship
 Total Funding - 80,000 (Canadian dollar)
 Portion of Funding Received - 46,666 (Canadian dollar)
 Funding Competitive?: Yes

Funding by Year:

2006/5 - 2009/4 Total Funding - 80,000
 Portion of Funding Received - 46,666
 Time Commitment: 80

Student/Postdoctoral Supervision

Bachelor's [n=7]

2021/5 - 2021/8 Principal Supervisor	Guan, Chelsea (Completed) , Concordia University Thesis/Project Title: Detecting advanced phishing and malicious websites Present Position: Unknown
2021/5 - 2021/8 Principal Supervisor	Slimi, Adam (Completed) , ENSTA (National School of Advanced Techniques), Paris, France Thesis/Project Title: Certificate analysis in TOR Onion sites Present Position: Unknown
2019/5 - 2019/8 Principal Supervisor	Brillant-Giroux, Simon (Completed) , Concordia University Thesis/Project Title: Permission usage contextuality of Android apps Present Position: Software developer, Amazon AWS
2019/5 - 2019/8 Principal Supervisor	Fleurant, Nohan (Completed) , Concordia University Thesis/Project Title: Permission usage contextuality of Android apps Present Position: Software developer, INEAT Group
2016/5 - 2016/8 Principal Supervisor	Fisher, Philippe (Completed) , Concordia University Student Degree Start Date: 2016/1 Thesis/Project Title: End-to-end Encryption in Cloud-based Services (NSERC USRA Intern) Present Position: Software Developer, Broadsign
2016/5 - 2016/8 Principal Supervisor	Proctor-Shah, Sebastian (Completed) , Concordia University Student Degree Start Date: 2016/1 Thesis/Project Title: Tracking Privacy-sensitive Resource Usage in Android (NSERC USRA Intern) Present Position: Unknown
2014/6 - 2014/9 Principal Supervisor	Isler, Devris (Completed) , Zirve University, Turkey Student Degree Start Date: 2014/6 Thesis/Project Title: Secure Email for a Multi-platform Environment (Mitacs Globalink Intern) Present Position: Unknown

Master's non-Thesis [n=4]

2020/9 - 2020/12 Principal Supervisor	Adhikari, Aashish (Completed) , Concordia University Thesis/Project Title: Privacy Exposure in Online Government Services Present Position: Platform Engineer, Manulife
2018/9 - 2018/12 Co-Supervisor	Philbert, Alexandre (Completed) , Concordia University Thesis/Project Title: State of DNS Privacy Present Position: Unknown
2018/5 - 2018/8 Principal Supervisor	Omar, Munzir (Completed) , Concordia University Thesis/Project Title: Privacy Leakage of Public Wi-Fi Hotspot Present Position: Unknown
2016/1 - 2016/4 Principal Supervisor	Samarasinghe, Nayanamana (Completed) , Concordia University Student Degree Start Date: 2015/5 Thesis/Project Title: Security in Internet of Things (IoT) devices Present Position: Engineer (Associate), Enterprise Infrastructure, Morgan Stanley

Master's Thesis [n=39]

2023/9 - 2025/8 Co-Supervisor	Tariq Houis (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Security Analysis of Fleet Management Systems Present Position: Research Assistant, Concordia University
2023/9 - 2025/8 Co-Supervisor	Fahimeh Rezaei (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Privacy issues in single-sign on systems Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Principal Supervisor	Mangeard, Philippe (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Principal Supervisor	Alam, Ajmain (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Principal Supervisor	Maheshwari, Adivardhan (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Co-Supervisor	Sun, Xin (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Co-Supervisor	Ragab, Abdelrahman (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Principal Supervisor	Lamisa, Kazi Farhat (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/1 - 2023/12 Principal Supervisor	Baskaran, Supraja (In Progress) , Concordia University Thesis/Project Title: JavaScript vulnerabilities in mobile apps Present Position: Research Assistant, Concordia University
2021/9 - 2023/8 Principal Supervisor	Yu, Xiufen (Completed) , Concordia University Thesis/Project Title: Privacy Analysis of Technological Solutions Designed for Victims of Intimate Partner Abuse Present Position: Research Assistant, Concordia University
2021/9 - 2023/8 Co-Supervisor	Mohammadi, Hamed (In Progress) , Concordia University Thesis/Project Title: Evaluation of smart-contract vulnerability assessment tools Present Position: Research Assistant, Concordia University
2021/5 - 2023/1 Principal Supervisor	Pagey, Rohan (Completed) , Concordia University Thesis/Project Title: Security Weaknesses in E-commerce Platforms Present Position: Product Security Analyst, HackerOne

2021/5 - 2022/8 Principal Supervisor	Ramez Al Aghbar (In Progress) , Concordia University Student Degree Expected Date: 2022/8 Thesis/Project Title: Security and Privacy Analysis of Online Gaming Platforms Present Position: Research Assistant, Concordia University
2021/5 - 2022/8 Principal Supervisor	Rabotka, Vladimir (In Progress) , Concordia University Student Degree Start Date: 2013/1 Student Degree Expected Date: 2022/8 Student Canadian Residency Status: Canadian Citizen Thesis/Project Title: Characterizing Malware in Behaviors through Dynamic Analysis Present Position: Unknown
2021/1 - 2023/1 Principal Supervisor	Tejaswi, Bhaskar (Completed) , Concordia University Thesis/Project Title: Security Weaknesses in IoT Management Platforms Present Position: Application Security Specialist, OneSpan
2020/9 - 2022/8 Co-Supervisor	Brendan Wood (In Progress) , Concordia University Student Degree Expected Date: 2022/8 Thesis/Project Title: Security Analysis of Autonomic Networking Protocols and Solutions Present Position: Research Assistant, Concordia University
2020/9 - 2022/7 Principal Supervisor	Kluban, Maryna (Completed) , Concordia University Thesis/Project Title: Detection of Vulnerable JavaScript Functions in Real-World Applications Present Position: Cybersecurity consultant
2020/9 - 2022/8 Co-Supervisor	Pranay Kapoor (Completed) , Concordia University Thesis/Project Title: Security and Privacy Analysis of Online Solutions for Seniors Present Position: Full Stack Engineer (Digital Identity Security), Thales Group
2020/1 - 2022/4 Co-Supervisor	Salehi, Mehdi (Completed) , Concordia University Thesis/Project Title: An Analysis of Upgradeability, Oracles, and Stablecoins in the Ethereum Blockchain Present Position: Blockchain developer, Offchain Labs
2019/9 - 2021/9 Principal Supervisor	Elgharabawy, Mounir (Completed) , Concordia University Thesis/Project Title: Cross-vendor Security Analysis of Android Unix Domain Sockets Present Position: AV Engine Developer, Fortinet
2019/9 - 2021/12 Co-Supervisor	Shobiri, Behnam (Completed) , Concordia University Thesis/Project Title: CDNs' Dark Side: Identifying Security Problems in CDN-to-Origin Present Position: Security Researcher, Tigera
2019/5 - 2021/8 Co-Supervisor	Uddin, Md. Shahab (Completed) , Concordia University Thesis/Project Title: HORUS: A Security Assessment Framework for Android Crypto Wallets Present Position: Information Security Analyst, Lowe's Canada
2019/1 - 2020/9 Principal Supervisor	Osman, Tousif (Completed) , Concordia University Thesis/Project Title: AppVeto: Securing Android Applications through Resource Access Veto Present Position: Software Engineer, Morningstar Research Inc.
2019/1 - 2020/11 Principal Supervisor	Duchaussoy, Quentin (Completed) , Concordia University Thesis/Project Title: Security and Privacy Analysis of Parental Control Solutions Present Position: Security Engineer, AMOSSYS, France
2018/9 - 2021/3 Co-Supervisor	Safaie, Tina (Completed) , Concordia University Thesis/Project Title: ByPass: Reconsidering the Usability of Password Managers Present Position: Information Security Analyst, GENAIZ

- 2018/9 - 2020/5
Principal Supervisor Ali, Suzan (Completed) , Concordia University
Thesis/Project Title: A Large-Scale Evaluation of Privacy Practices of Public Wifi Captive Portals
Present Position: Cyber Security Instructor, University of Doha
- 2017/9 - 2020/9
Principal Supervisor Jafari, Mina (Completed) , Concordia University
Thesis/Project Title: Measuring the Effectiveness of Microsoft Authenticode: A Systematic Analysis of Signed Freeware
Present Position: Security Engineer, SAP Canada
- 2016/9 - 2018/12
Principal Supervisor Hossen, Zakir Md. (Completed) , Concordia University
Student Degree Start Date: 2016/9
Thesis/Project Title: On Understanding Permission Usage Contextuality of Android Apps
Present Position: Android Engineer, Amazon
- 2016/9 - 2018/8
Principal Supervisor Fisher, Philippe (In Progress) , Concordia University
Student Degree Start Date: 2016/9
Student Degree Expected Date: 2018/8
Thesis/Project Title: Analyzing OS Mechanisms for Protecting Anti-Ransomware Processes
- 2015/9 - 2017/8
Principal Supervisor Lew, Scott (In Progress) , Concordia University
Student Degree Start Date: 2015/9
Student Degree Expected Date: 2017/8
Thesis/Project Title: Security Analysis of Containerization Technologies
Present Position: Service Desk Manager, Appnovation Technologies, Montreal
- 2014/9 - 2016/12
Co-Supervisor Khanna, Abhimanyu (Completed) , Concordia University
Student Degree Start Date: 2014/9
Student Degree Received Date: 2017/4
Thesis/Project Title: Towards Usable and Fine-grained Security for HTTPS with Middleboxes
Present Position: Senior Consultant, Deloitte Canada
- 2014/1 - 2016/8
Principal Supervisor Mondal, Briti Sundar (Completed) , Concordia University
Student Degree Start Date: 2014/1
Student Canadian Residency Status: Study Permit
Thesis/Project Title: Bintype: A Scalable Type Inference Tool for Compiled C Programs
Present Position: Software Engineer, Meta/Facebook
- 2014/1 - 2016/3
Principal Supervisor Shahkar, Arash (Completed) , Concordia University
Student Degree Start Date: 2014/1
Student Canadian Residency Status: Study Permit
Thesis/Project Title: On Matching Binary to Source Code
Present Position: Software Engineer, Carta
- 2014/1 - 2016/12
Principal Supervisor Khanna, Parul (Completed) , Concordia University
Student Degree Start Date: 2014/1
Student Degree Received Date: 2017/4
Student Canadian Residency Status: Study Permit
Thesis/Project Title: Detecting Privacy Leaks Through Existing Android Frameworks
Present Position: Vice President - Cyber Security, BNP Paribas
- 2013/5 - 2014/4
Principal Supervisor de Carné de Carnavalet, Xavier (Completed) , Concordia University
Student Degree Start Date: 2013/5
Student Degree Received Date: 2014/4
Student Canadian Residency Status: Study Permit
Thesis/Project Title: A Large-scale Evaluation of High-impact Password Strength Meters
Present Position: Ph.D. student, Concordia University

- 2012/9 - 2014/8
Principal Supervisor Majumdar, Suryadipta (Completed) , Concordia University
Student Degree Start Date: 2012/9
Student Degree Received Date: 2014/8
Thesis/Project Title: On End-to-end Encryption for Cloud-based Services
Present Position: Ph.D. student, Concordia University
- 2012/9 - 2013/12
Co-Supervisor Kara, Abdullah Mert (Completed) , Concordia University
Student Degree Start Date: 2012/9
Student Degree Received Date: 2013/12
Thesis/Project Title: Malicious Payload Distribution Channels in Domain Name System
Present Position: Software Developer, Ericsson Canada

Other Supervisors: Co-Supervisor - Debbabi, Mourad
- 2011/9 - 2013/8
Principal Supervisor Saberi Pirouz, Atieh (Completed) , Concordia University
Student Degree Start Date: 2011/9
Student Degree Received Date: 2013/8
Thesis/Project Title: Securing Email Through Online Social Networks
Present Position: Software Engineer, ComboTrip.com (US)
- 2011/9 - 2013/4
Principal Supervisor Skillen, Adam (Completed) , Concordia University
Student Degree Start Date: 2011/9
Student Degree Received Date: 2013/4
Thesis/Project Title: Deniable Storage Encryption for Mobile Devices
Present Position: IT Security Analyst, CGI, Ottawa, Canada
- Doctorate [n=5]**
- 2020/9 - 2024/8
Principal Supervisor Pourali, Sajjad (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: Detection of Hidden Communication Channels
Present Position: Research Assistant, Concordia University
- 2020/5 - 2021/12
Co-Supervisor Mahmoud, Moustafa (Withdrawn) , Concordia University
Thesis/Project Title: Early Stage Detection of Advanced Persistent Malware
Present Position: Technical Lead - Production Security Incident Response, BNP Paribas
- 2017/9 - 2022/11
Principal Supervisor Samarasinghe, Nayanamana (Completed) , Concordia University
Thesis/Project Title: Measuring for privacy: From tracking to cloaking
Present Position: Application Performance Specialist, Morgan Stanley
- 2014/5 - 2019/7
Principal Supervisor de Carné de Carnavalet, Xavier (Completed) , Concordia University
Student Degree Start Date: 2014/5
Thesis/Project Title: Last-Mile TLS Interception: Analysis and Observation of the Non-Public HTTPS Ecosystem
Present Position: Assistant professor, Hong Kong Polytechnic University
- 2013/1 - 2018/7
Principal Supervisor Zhao, Lianying (Completed) , Concordia University
Student Degree Start Date: 2013/1
Student Canadian Residency Status: Study Permit
Thesis/Project Title: Authentication and Data Protection under Strong Adversarial Model
Present Position: Assistant professor, Carleton University, Ottawa, Canada

Event Administration

- 2020/6 - 2020/12
Publications Chair, New Security Paradigms Workshop (NSPW 2020), Workshop, 2020/10 - 2020/10

2019/6 - 2019/12	Publications Chair, New Security Paradigms Workshop (NSPW 2019), Workshop, 2019/9 - 2019/9
2018/6 - 2018/12	Publications Chair, New Security Paradigms Workshop (NSPW 2018), Workshop, 2018/8 - 2018/8
2017/9 - 2018/12	General co-Chair, The 25th ACM Conference on Computer and Communications Security (ACM CCS 2018), Conference, 2018/10 - 2018/10
2017/6 - 2017/12	Publications Chair, New Security Paradigms Workshop (NSPW 2017), Workshop, 2017/10 - 2017/10
2011/9 - 2017/9	Principal Organizer, Security, privacy and forensics (SPF) seminar at Concordia (bi-weekly, ongoing), Seminar, 2011/9 - 2017/9
2016/6 - 2016/12	Publications Chair, New Security Paradigms Workshop (NSPW 2016), Workshop, 2016/9 - 2016/9
2016/5 - 2016/12	Program Co-chair, ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM 2016), Workshop, 2016/10 - 2016/10
2016/10 - 2016/10	Session Chair, Session: "Network security I" in ACM Conference on Computer and Communications Security (CCS 2016), Conference, 2016/10 - 2016/10
2015/6 - 2015/12	Publications Chair, New Security Paradigms Workshop (NSPW 2015), Workshop, 2015/9 - 2015/9
2015/4 - 2015/10	Local Arrangements Chair, Symposium on Reliable Distributed Systems (SRDS 2015), Conference, 2015/9 - 2015/10
2014/1 - 2014/9	Publicity Chair, New Security Paradigms Workshop (NSPW 2014), Workshop, 2014/9 - 2014/9
2010/2 - 2010/4	Local Organizer, Program committee meeting for USENIX Security 2010, Conference, USENIX Association, 2010/4 - 2010/4

Editorial Activities

2020/6 - 2024/5	Associate Editor, IEEE Security & Privacy, Journal
2022/9 - 2023/4	Member, Technical Program Committee, ACM Asia Conference on Computer and Communications Security (ASIACCS 2023), Conference Abstract
2022/5 - 2022/6	Reviewer, IEEE Transactions on Information Forensics & Security (TIFS), Journal
2021/7 - 2022/6	Member, Technical Program Committee, USENIX Security Symposium 2022, Conference Abstract
2021/1 - 2021/12	Reviewer, IEEE Transactions on Information Forensics and Security (TIFS), Journal
2021/1 - 2021/12	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal
2020/1 - 2020/12	Reviewer, IEEE Transactions on Technology and Society, Journal
2019/9 - 2020/8	Guest Co-Editor, IEEE Security & Privacy, Special issue on Hardware-assisted Security 2020, Journal
2020/5 - 2020/7	Member, Technical Program Committee, EAI Security and Privacy in Communication Networks, SecureComm 2020, Conference Abstract
2019/1 - 2019/12	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal
2019/1 - 2019/12	Reviewer, IEEE Access, Journal
2019/1 - 2019/12	Reviewer, IEEE Internet Computing, SI: Meaning of Identity on the Internet, Journal

2019/1 - 2019/12	Reviewer, IEEE IEEE Security & Privacy, SPSI: Internet of Things (IoT) Security and Privacy, Journal
2019/1 - 2019/12	Reviewer, IEEE Transactions on Network and Service Management (TNSM), Journal
2019/5 - 2019/10	Member, Technical Program Committee, ACM Conference on Computer and Communications Security (ACM CCS) 2019, Conference Abstract
2018/1 - 2018/12	Reviewer, Journal of Information and Telecommunication, Journal
2018/1 - 2018/12	Reviewer, Elsevier Computers & Security, Journal
2018/2 - 2018/5	Member, Technical Program Committee, USENIX Security Symposium 2018, Conference Abstract
2017/12 - 2018/3	Member, Technical Program Committee, ACM Asia Conference on Computer and Communications Security (ASIACCS) 2018, Conference Abstract
2017/1 - 2017/12	Reviewer, IEEE Transactions on Information Forensics and Security (TIFS), Journal
2017/1 - 2017/12	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal
2017/9 - 2017/11	Member, Technical Program Committee, Workshop on Socio-Technical Aspects of Security and Trust (STAST) 2017, Conference Abstract
2017/9 - 2017/10	Member, Technical Program Committee, North America Applied Research Competition (CSAW) 2017, Conference Abstract
2017/6 - 2017/8	Member, Technical Program Committee, Conference on Privacy, Security and Trust (PST), 2017, Conference Abstract
2016/11 - 2017/3	Member, Technical Program Committee, ACM Asia Conference on Computer and Communications Security (ASIACCS 2017), Conference Abstract
2016/7 - 2016/11	Chair, Publications, New Security Paradigms Workshop (NSPW 2016), Conference Abstract
2016/9 - 2016/10	Reviewer, IEEE Communications Letters, Journal
2016/7 - 2016/9	Co-Chair, Technical Program Committee, ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM 2016), Conference Abstract
2016/5 - 2016/7	Member, Technical Program Committee, ACM Conference on Computer and Communications Security (CCS 2016), Conference Abstract
2015/10 - 2016/7	Reviewer, ACM Computing Surveys, Journal
2015/1 - 2016/7	Reviewer, IEEE Transactions on Information Forensics and Security (TIFS), Journal
2015/1 - 2016/7	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal
2016/4 - 2016/6	Member, Technical Program Committee, New Security Paradigms Workshop (NSPW 2016), Conference Abstract
2015/12 - 2016/1	Reviewer, IEEE Communications Letters, Journal
2015/1 - 2015/12	Reviewer, IEEE Transactions on Emerging Topics in Computing (TETC), Journal
2015/1 - 2015/12	Reviewer, Scientific Programming, Journal
2014/1 - 2015/12	Reviewer, IEEE Transactions on Cloud Computing (TCC), Journal
2015/7 - 2015/11	Chair, Publications, New Security Paradigms Workshop (NSPW 2015), Conference Abstract
2015/6 - 2015/7	Member, Technical Program Committee, ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM 2015), Conference Abstract

2015/5 - 2015/6	Member, Technical Program Committee, Conference on Trust & Trustworthy Computing (TRUST 2015), Conference Abstract
2015/4 - 2015/6	Member, Technical Program Committee, New Security Paradigms Workshop (NSPW 2015), Conference Abstract
2013/1 - 2014/12	Reviewer, Wiley Security and Communication Networks (SCN), Journal
2012/1 - 2014/12	Reviewer, ACM Transactions on Information and System Security (TISSEC), Journal
2014/7 - 2014/9	Member, Technical Program Committee, IEEE International Conference on Parallel and Distributed Systems (ICPADS 2014), Conference Abstract
2014/6 - 2014/8	Member, Technical Program Committee, Annual Computer Security Applications Conference (ACSAC 2014), Conference Abstract
2014/3 - 2014/4	Member, Technical Program Committee, Conference on Trust & Trustworthy Computing (TRUST 2014), Conference Abstract
2012/1 - 2013/12	Reviewer, IEEE Transactions on Information Forensics and Security (TIFS), Journal
2012/1 - 2013/12	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal
2013/8 - 2013/10	Member, Technical Program Committee, IEEE International Symposium on High Assurance Systems Engineering (HASE 2014), Conference Abstract
2013/8 - 2013/9	Member, Technical Program Committee, Workshop on Anti-malware Testing Research (WATeR 2013), Conference Abstract
2013/3 - 2013/3	Member, Technical Program Committee, Conference on Trust & Trustworthy Computing (TRUST 2013), Conference Abstract
2012/3 - 2012/5	Member, Technical Program Committee, Conference on Availability, Reliability and Security (ARES 2012), Conference Abstract
2012/3 - 2012/5	Member, Technical Program Committee, Conference on Privacy, Security and Trust (PST 2012), Conference Abstract
2010/2 - 2010/4	Member, Technical Program Committee, USENIX Security Symposium 2010, Conference Abstract

Journal Review Activities

2012/1 - 2013/6	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC) Number of Works Reviewed / Refereed: 2
2012/6 - 2013/1	Reviewer, ACM Transactions on Information and System Security (TISSEC) Number of Works Reviewed / Refereed: 2
2012/5 - 2013/1	Reviewer, IEEE Transactions on Information Forensics and Security (TIFS) Number of Works Reviewed / Refereed: 2
2010/10 - 2010/12	Reviewer, Springer World Wide Web Journal (WWWJ) Number of Works Reviewed / Refereed: 1
2009/9 - 2009/11	Reviewer, Computer Science and Information Systems (ComSIS) Journal Number of Works Reviewed / Refereed: 1
2008/2 - 2008/3	Reviewer, Journal of Information Security (IJIS) Number of Works Reviewed / Refereed: 1

Conference Review Activities

2013/3 - 2013/4	Program Committee Member, Trust & Trustworthy Computing (TRUST) 2013, Blind, Imperial College London, UK Number of Works Reviewed / Refereed: 5
2013/2 - 2013/2	Reviewer, IEEE International Symposium on Information Theory (ISIT) 2013, Blind, IEEE Number of Works Reviewed / Refereed: 1
2012/4 - 2012/5	Program Committee Member, Privacy, Security and Trust (PST) 2012, Blind, Institut Mines-Telecom Paris, France Number of Works Reviewed / Refereed: 4
2012/4 - 2012/4	Program Committee Member, Availability, Reliability and Security (ARES) 2012, Blind, University of Economics in Prague Number of Works Reviewed / Refereed: 5
2011/1 - 2011/1	External reviewer, IEEE/IFIP Dependable Systems and Networks (DSN) 2011, Blind Number of Works Reviewed / Refereed: 1
2010/2 - 2010/4	Program Committee Member, USENIX Security Symposium 2010, Blind, USENIX Association Number of Works Reviewed / Refereed: 21
2009/6 - 2009/6	External reviewer, ACM Conference on Computer and Communications Security (CCS) 2009, Blind, ACM SIGSAC Number of Works Reviewed / Refereed: 2
2009/4 - 2009/5	Reviewer, International Conference on Ubiquitous Computing (UbiComp) 2009, Blind, ACM Number of Works Reviewed / Refereed: 1
2009/3 - 2009/3	External reviewer, Symposium On Usable Privacy and Security 2009, Blind, Carnegie Mellon CyLab and Google Number of Works Reviewed / Refereed: 1
2009/3 - 2009/3	External reviewer, USENIX Security Symposium 2009, Blind, USENIX Association Number of Works Reviewed / Refereed: 2
2008/10 - 2008/10	External reviewer, ACM Symposium on Information, Computer and Communications Security (ASIACCS) 2009, Blind, ACM SIGSAC Number of Works Reviewed / Refereed: 1
2008/3 - 2008/3	External reviewer, USENIX Security Symposium 2008, Blind, USENIX Association Number of Works Reviewed / Refereed: 1
2007/6 - 2007/6	External reviewer, Annual Computer Security Applications Conference (ACSAC) 2007, Blind, Applied Computer Security Associates Number of Works Reviewed / Refereed: 4
2007/3 - 2007/4	External reviewer, Symposium On Usable Privacy and Security 2007, Blind, Carnegie Mellon CyLab Number of Works Reviewed / Refereed: 2
2007/2 - 2007/2	External reviewer, USENIX Security Symposium 2007, Blind, USENIX Association Number of Works Reviewed / Refereed: 2

Graduate Examination Activities

2013/6 - 2013/6	Master's Oral Exam Member, Weijia Su, Concordia Institute for Information Systems Engineering, Concordia University
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2013/4 - 2013/5	PhD Comprehensive Exam Committee Member, Riham Altawi, Concordia Institute for Information Systems Engineering, Concordia University
2013/1 - 2013/3	PhD External Reader, Jan-Erik Ekberg, Computer Science and Engineering, Aalto University
2013/1 - 2013/3	PhD Oral Exam Member, Khalil Al-Hussaeni, Electrical and Computer Engineering, Concordia University
2012/10 - 2012/11	PhD Oral Exam Member, Ali Mosleh, Electrical and Computer Engineering, Concordia University
2012/7 - 2012/9	PhD Oral Exam Member, Abdel Alim K. Farag, Electrical and Computer Engineering, Concordia University
2012/5 - 2012/5	Master's Oral Exam Member, Michael Schmid, Concordia Institute for Information Systems Engineering, Concordia University
2012/1 - 2012/3	PhD External Reader, Kari Kostiainen, Computer Science and Engineering, Aalto University
2011/8 - 2011/8	Master's Oral Exam Member, Wasim Hussain, Electrical and Computer Engineering, Concordia University

Committee Memberships

2013/2 - 2013/5	Committee Member, Preliminary Ph.D. thesis examiner (external), Helsinki University of Technology Jan-Erik Ekberg; supervisors: Tuomas Aura, N. Asokan; Aalto University (formerly known as Helsinki University of Technology)
2012/2 - 2012/5	Committee Member, Preliminary Ph.D. thesis examiner (external), Helsinki University of Technology Kari Kostiainen; supervisors: Tuomas Aura, N. Asokan; Aalto University (formerly known as Helsinki University of Technology)

Presentations

- (2021). Betrayed by the Guardian: Security and Privacy Risks of Parental Control Solutions. PrivacyCon 2021, US Federal Trade Commission, United States of America
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
- (2021). In the Name of Security: A Critical Evaluation of Online Security Products. Identity, Privacy and Security Institute (IPSI) Public Lecture, University of Toronto, Toronto, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No
- (2019). On Data Protection against Strong Adversaries. Security Seminar at Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh
Main Audience: Researcher
Invited?: Yes, Keynote?: No

4. (2018). Securing User Data and Open-source Binaries against Strong Adversaries. Security Seminar (Cyberphysical Systems group) at National Institute for Advanced Industrial Science and Technology (AIST), Tsukuba, Tsukuba, Japan
Main Audience: Researcher
Invited?: Yes, Keynote?: No
5. (2018). Password-based Authentication: from Measurements to Solutions. Mini security workshop at Waseda University, Tokyo, Japan
Main Audience: Researcher
Invited?: Yes, Keynote?: No
6. (2018). Securing User Data and Open-source Binaries against Strong Adversaries. Trusted Computing Group, Japan Chapter (TCG-JRF), Tokyo, Japan
Main Audience: Researcher
Invited?: Yes, Keynote?: No
7. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. Electrical Engineering departmental seminar at KTH Royal Institute of Technology, Stockholm, Sweden
Main Audience: Researcher
Invited?: Yes, Keynote?: No
8. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. Seminar for the Cyber-security research group at Tallinn University of Technology, Tallinn, Estonia
Main Audience: Researcher
Invited?: Yes, Keynote?: No
9. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. CS Colloquium, Friedrich-Alexander University Erlangen-Nurnberg, Erlangen, Germany
Main Audience: Researcher
Invited?: Yes, Keynote?: No
10. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. Security Seminar at the University of Innsbruck, Innsbruck, Austria
Main Audience: Researcher
Invited?: Yes, Keynote?: No
11. (2017). Securing Disk and RAM Data Against Strong Adversaries. Security Seminar (CrySP group) at the University of Waterloo, Waterloo, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No
12. (2017). Killed by Proxy: Analyzing Client-end TLS Interception Software. PrivacyCon 2017, US Federal Trade Commission, United States of America
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
13. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. CS departmental seminar at the University of Helsinki, Helsinki, Finland
Main Audience: Researcher
Invited?: Yes, Keynote?: No
14. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. Security seminar (privacy engineering team), Google Zurich, Zurich, Switzerland
Main Audience: Researcher
Invited?: Yes, Keynote?: No
15. (2017). Securing Disk and RAM Data Against Strong Adversaries. Security Colloquium at Munich University of Applied Sciences, Munich, Germany
Main Audience: Researcher
Invited?: Yes, Keynote?: No

16. (2017). Analyses, Measurements and Solutions – A Few Example Cases in Data Security and Authentication. ZISC Lunch Seminar at ETH Zurich, Zurich, Switzerland
Main Audience: Researcher
Invited?: Yes, Keynote?: No
17. (2016). Data Security under Coercion and Physical Attacks. Lecture Series "Current Trends in IT Security", organized by the Chair for IT Security, Technical University of Munich (TU Munich), Munich, Germany
Main Audience: Researcher
Invited?: Yes, Keynote?: No
18. (2016). Data Security under Coercion and Physical Attacks. CS Forum, Aalto University, Espoo, Finland
Main Audience: Researcher
Invited?: Yes, Keynote?: No
19. (2016). Password-based Deceptive Authentication for Data Security. Security seminar at United International University, Dhaka, Bangladesh
Main Audience: Knowledge User
Invited?: Yes, Keynote?: Yes
20. (2012). Designing Systems for an Untrusted Internet. Security Seminar at North South University, Dhaka, Bangladesh
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
21. (2012). Designing Systems for an Untrusted Internet. Security Seminar at Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
22. (2011). IVApps: Trusted Computing for the Masses. MITACS Digital Security Seminar Series at Carleton University, Ottawa, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
23. (2011). ISSNet Research on Trustworthy Networks and Services. Canada-EU Future Internet Workshop, Waterloo, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
24. (2011). Unicorn: Two-Factor Attestation for Data Security. TechnoTalks at Vanier College, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No, Competitive?: No
25. (2011). Authentication and Securing Personal Information in an Untrusted Internet. Security Seminar at Concordia University, Montreal, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
26. (2010). The Usable Security of Passwords based on Digital Objects: From Design and Analysis to User Study. Seminar at University of Calgary, Calgary, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
27. (2010). The Usable Security of Passwords based on Digital Objects: From Design and Analysis to User Study. Seminar at Simon Fraser University, Vancouver, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No

28. (2010). The Usable Security of Passwords based on Digital Objects: From Design and Analysis to User Study. Seminar at University of British Columbia, Vancouver, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
29. (2010). The Usable Security of Passwords based on Digital Objects: From Design and Analysis to User Study. Seminar at University of Ontario Institute of Technology, Oshawa, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
30. Van Oorschot PC. (2008). Security and Usability: The Gap in Real-World Online Banking. Financial Consumer Agency of Canada (FCAC), Ottawa, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No, Competitive?: No

Broadcast Interviews

- | | |
|----------------------------|--|
| 2021/08/20 -
2021/08/20 | Parental control privacy analysis, The Elias Makos Show, CJAD 800 (Montreal news talk radio station) |
| 2016/05/25 -
2016/05/25 | Security software vulnerabilities, BBC Click (technological and digital news from around the world; recorded phone interview), BBC World Service, UK |
| 2016/05/07 -
2016/05/07 | Security risks due to security software, News and talk radio (live-by-phone), CBS Radio News, San Francisco, USA |
| 2014/04/16 -
2014/04/16 | Are anti-virus programs useless?, KW Magazine (live-by-phone)), CKWR FM, Kitchener, Ontario, Canada |

Text Interviews

- | | |
|------------|---|
| 2022/10/24 | Google's Incognito Mode Isn't As Private As It Sounds — Here's What You Need To Know, MTLBlog, https://www.mtlblog.com/googles-incognito-mode-isnt-as-private-as-it-sounds-heres-what-you-need-to-know |
| 2022/05/19 | Government websites and apps use the same tracking software as commercial ones: Concordia research, The Suburban: https://www.thesuburban.com/life/education/government-websites-and-apps-use-the-same-tracking-software-as-commercial-ones-concordia-research/article_c9fc748c-d781-11ec-930b-67df312a7313.html |
| 2022/05/19 | Oui, Les Gouvernements Vous Suivent, Trouve L'université Concordia, Noovo.info https://www.noovo.info/nouvelle/oui-les-gouvernements-vous-suivent.html |
| 2022/05/18 | Government Websites, Apps Use Same Tracking Software as Commercial Sites, ACM Technews: https://technews.acm.org/archives.cfm?fo=2022-05-may/may-18-2022.html |
| 2021/08/24 | Wifi public : zéro protection, OC Magazine: https://ocmagazine.org/rubriques/vie-privee/wifi-public-zero-protection |
| 2021/08/18 | Sécurité et vie privée: les applications de contrôle parental font rarement l'affaire, Le Devoir: https://www.ledevoir.com/culture/625596/recherche-et-innovation-securite-et-vie-privee-les-applications-de-controle-parental-font-rarement-l-affaire |
| 2020/12/06 | Contrôle parental, La Presse: https://www.lapresse.ca/affaires/techno/2020-12-06/clins-d-oeil-technologiques.php |
| 2020/12/02 | Many Popular Parental Control Solutions Are Insecure, ACM Technews: https://technews.acm.org/archives.cfm?fo=2020-12-dec/dec-04-2020.html |

- 2019/12/22 Most free WiFi hotspots in Montreal track your personal data, study finds, Montreal Gazette: <https://montrealgazette.com/news/local-news/most-free-wifi-hotspots-in-montreal-track-your-personal-data-study-finds>
- 2019/07/23 Un coffre-fort contre les pirates informatiques, La Presse: <https://www.lapresse.ca/actualites/2019-07-23/un-coffre-fort-contre-les-pirates-informatiques>
- 2019/07/17 Concordia professor develops prototype to thwart data theft, Montreal Gazette: <https://montrealgazette.com/news/local-news/concordia-professor-develops-prototype-to-thwart-data-theft>
- 2019/05/21 Wajam, le logiciel de publicités indésirables qui espionne des centaines de millions d'internautes, Le Figaro: <https://www.lefigaro.fr/secteur/high-tech/wajam-le-logiciel-de-publicites-indesirables-qui-espionne-des-millions-d-internautes-20190521>
- 2019/05/20 Let adware be treated as malware, Canuck boffins declare after breaking open Wajam ad injector, The Register: https://www.theregister.com/2019/05/20/wajam_malware_claims/
- 2019/03/30 Data deletion malware can be devastating but also thwarted, says Concordia professor Mohammad Mannan, The Suburban: https://www.thesuburban.com/life/education/data-deletion-malware-can-be-devastating-but-also-thwarted-says/article_c44ff64c-518a-11e9-b749-1f56f30c3b16.html
- 2018/10/08 It's 2018, and network middleware still can't handle TLS without breaking encryption, ZDNet: <https://www.zdnet.com/article/its-2018-and-network-middleware-still-cant-handle-tls-without-breaking-encryption/>
- 2018/10/08 Network Middleware Still Can't Handle TLS Without Breaking Encryption, Slashdot.org: <https://tech.slashdot.org/story/18/10/08/186222/network-middleware-still-cant-handle-tls-without-breaking-encryption>
- 2018/09/27 TLS proxies? Nah. Truthfully Less Secure 'n' poxy, say Canadian infosec researchers, The Register: https://www.theregister.com/2018/09/27/tls_proxies_still_mostly_rubbish_say_canadian_infosec_boffins/
- 2018/02/23 Facebook's mandatory malware scan is an intrusive mess, WIRED: <https://www.wired.com/story/facebook-mandatory-malware-scan/>
- 2017/10/11 Kaspersky, Russia, and the antivirus paradox, WIRED: <https://www.wired.com/story/kaspersky-russia-antivirus/>
- 2017/03/23 The clever 'DoubleAgent' attack turns antivirus into malware, WIRED: <https://www.wired.com/2017/03/clever-doubleagent-attack-turns-antivirus-malware/>
- 2017/02/06 New Security Advances Bridge the Gap Between Software and Hardware, All About Circuits: <https://www.allaboutcircuits.com/news/new-security-advances-bridge-the-gap-between-software-and-hardware/>
- 2016/11/25 Software Hypnoguard Can Protect Your Laptop, Even When it's Asleep, CNN-News18: <https://www.news18.com/news/tech/software-hypnoguard-can-protect-your-laptop-even-when-its-asleep-1315846.html>
- 2016/11/23 How to protect your laptop — even when it's asleep, Science Magazine: <https://scienmag.com/how-to-protect-your-laptop-even-when-its-asleep/>
- 2016/07/13 Hoogleraar hekelt nut van anti-virussoftware, Security.nl: <https://www.security.nl/posting/477790/Hoogleraar+hekelt+nut+van+anti-virussoftware>
- 2016/07/12 Antivirüsler gerçekten koruyor mu?, Hurriyet (Turkey): <http://www.hurriyet.com.tr/antivirusler-gercekten-koruyor-mu-40141589>

- 2016/07/11 U.S. security agency warns against 'useless' antivirus programs, Digital Journal: <http://www.digitaljournal.com/technology/usa-security-agency-warns-against-useless-antivirus-programs/article/469596>
- 2016/07/08 Antivirus software is 'increasingly useless' and may make your computer less safe, CBC News Technology & Science: <http://www.cbc.ca/news/technology/antivirus-software-1.3668746>
- 2016/05/23 Independent test shows Avast offers best HTTPS protection in the market, AVAST Software: <https://blog.avast.com/independent-test-shows-avast-offers-best-https-protection-in-the-market>
- 2016/05/05 Les logiciels de sécurité informatique sont-ils dangereux?, LesAffaires: <https://www.lesaffaires.com/techno/technologie-de-l-information/les-logiciels-de-securite-informatique-sont-ils-dangereux/587247>
- 2016/05/05 Browsers protect better than antivirus, research suggests, Engineering and Technology Magazine: <http://eandt.theiet.org/news/2016/may/antivirus-decreases-security.cfm>
- 2016/05/05 TLS proxies: insecure by design say boffins, The Register (UK): http://www.theregister.co.uk/2016/05/05/tls_proxies_are_insecure/
- 2016/05/05 Antivirus can make online transactions less safe: Study, Times of India: <http://timesofindia.indiatimes.com/tech/tech-news/Antivirus-can-make-online-transactions-less-safe-Study/articleshow/52131112.cms>
- 2016/05/05 Is your antivirus software putting you MORE at risk? Programs are found to offer lower levels of security than some browsers, Daily Mail (UK): <http://www.dailymail.co.uk/sciencetech/article-3574724/Is-antivirus-software-putting-risk-Programs-offer-lower-levels-security-browsers.html>
- 2016/05/04 Dangereux, les logiciels de sécurité informatique?, LaPresse: <http://techno.lapresse.ca/nouvelles/logiciels/201605/04/01-4977972-dangereux-les-logiciels-de-securite-informatique-.php>
- 2016/05/04 Not so safe: Security software can put computers at risk, Science Daily: <https://www.sciencedaily.com/releases/2016/05/160504161650.htm> [Also appeared in: Daily Express UK, International Business Times UK, Business Standard, ACM Technews, Heise.de]
- 2016/01/20 2015's worst passwords are still really bad (so please tell me yours is not on the list), Forbes: <http://www.forbes.com/sites/ygrauer/2016/01/20/2015-passwords-really-bad-make-sure-yours-not-on-list/>
- 2015/08/19 Cyber security: will the Ashley Madison hack change our habits?, Concordia News: <http://www.concordia.ca/cunews/main/stories/2015/08/19/ashley-madison-hackers-download-data.html>
- 2015/04/01 Quebec sees 52% jump in cybercrime cases, CBC News: <http://www.cbc.ca/news/canada/montreal/quebec-sees-52-jump-in-cybercrime-cases-1.3017449>
- 2015/03/27 Zo maak je het ultieme wachtwoord, PC Magazine (Netherlands): <http://nl.pcmag.com/wachtwoord/1647/news/zo-maak-je-het-ultieme-wachtwoord>
- 2015/03/26 Many password strength meters are downright weak, researchers say, Slashdot: <https://it.slashdot.org/story/15/03/26/1540225/many-password-strength-meters-are-downright-weak-researchers-say> [Also appeared in: NetworkWorld.com, The Hill, CIO.de, ACM Technews]
- 2014/03/06 Experts claim malware has made antivirus useless, TechRadar: <http://www.techradar.com/news/software/security-software/experts-claim-malware-has-made-antivirus-useless-1231591>

- 2014/03/05 Malware threats making anti-virus software 'totally useless', CBC News: <http://www.cbc.ca/news/technology/malware-threats-making-anti-virus-software-totally-useless-1.2559432> [Also appeared in: Huffingtonpost.ca]
- 2014/02/24 Anti-NSA Blackphone 'commendable,' but will consumers buy it?, CBC News: <http://www.cbc.ca/news/technology/anti-nsa-blackphone-commendable-but-will-consumers-buy-it-1.2544562> [Also appeared in: Huffingtonpost.ca]
- 2008/08/12 Digital Objects as Passwords, Daily Telegraph UK
<http://www.telegraph.co.uk/technology/3358151/Name-that-tune-How-songs-could-be-the-passwords-of-the>
Description / Contribution Value: Name that tune: How songs could be the passwords of the future
- 2008/08/12 Digital Objects as Passwords, Slashdot.org
<http://it.slashdot.org/story/08/08/12/0144220/let-your-theme-song-be-your-password>
Description / Contribution Value: Let Your Theme Song be Your Password

Publications

Journal Articles

1. Mahmoud, M; Mannan, M; Youssef A. (2023). APTHunter: Detecting Advanced Persistent Threats in Early Stages. ACM Digital Threats: Research and Practice (DTRAP). 4(1): 1-31.
Published,
Refereed?: Yes, Open Access?: No
2. *Tejaswi, B; Mannan, M; Youssef A. (2023). Security Weaknesses in IoT Management Platforms. IEEE Internet of Things Journal.
In Press,
Refereed?: Yes
3. Galal, H; Mannan, M; Youssef A. (2022). Blindfold: Keeping Private Keys in PKIs and CDNs out of Sight. Elsevier Computers & Security. 118
Published,
Refereed?: Yes
4. Massacci, F; Sabetta, A; Mirkovic, J; Murray, T; Okhravi, H; Mannan, M; Rocha, A; Bodden, E; Geer, D. (2022). "Free" as in Freedom to Protest?. IEEE Security & Privacy. 20(5): 16-21.
Published,
Refereed?: No, Open Access?: No
5. *Shobiri, B; Mannan, M; Youssef A. (2021). CDNs' Dark Side: Security Problems in CDN-to-Origin Connections. ACM Digital Threats: Research and Practice (DTRAP).
In Press,
Refereed?: Yes
6. Peisert, S; Schneier, B; Okhravi, H; Massacci, F; Benzel, T; Landwehr, C; Mannan, M; Mirkovic, J; Prakash, A; Michael, J. (2021). Perspectives on the SolarWinds Incident. IEEE Security & Privacy. 19: 7-13.
Published,
Refereed?: No, Open Access?: No
7. *Samarasinghe, N; Mannan, M. (2021). On Cloaking Behaviors of Malicious Websites. Elsevier Computers & Security. 101: 1-18.
Published,
Refereed?: Yes, Open Access?: No

8. *Ali, S; *Elgharabawy, M; *Duchaussoy, Q; Mannan, M; Youssef, A. (2021). Parental Controls - Safer Internet Solutions or New Pitfalls?. IEEE Security & Privacy SPSI: ACSAC Nov/Dec 2021. : 2-12.
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22. Mannan M, Van Oorschot PC et al. (2011). Leveraging Personal Devices for Stronger Password Authentication from Untrusted Computers. *Journal of Computer Security*. 19(4): 703-750.
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Number of Contributors: 2
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First Listed Author
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Refereed?: Yes
Number of Contributors: 2

Thesis/Dissertation

1. Authentication and Securing Personal Information in an Untrusted Internet. (2009). Carleton University. Doctorate.
Number of Pages: 217 Supervisor: van Oorschot PC

Working Papers

1. Last Author. (Skillen A (*), Mannan M et al.). (2013). Myphrase: Passwords from your Own Words. : 21.
Number of Contributors: 2

Conference Publications

1. *Mangeard, P; *Yu, X; Mannan, M; Youssef, A. (2023). No Place to Hide: Privacy Exposure in Anti-Stalkerware Apps and Support Websites. Nordic Conference on Secure IT Systems (NordSec 2023), Oslo, Norway,
Conference Date: 2023/11
Paper
Published
Refereed?: Yes, Invited?: No
2. *Baskaran, S; Zhao, L; Mannan, M; Youssef, A. (2023). Measuring the Leakage and Exploitability of Authentication Secrets in Super-apps: The WeChat Case. Symposium on Research in Attacks, Intrusions and Defenses (RAID 2023), Hong Kong, Hong Kong,
Conference Date: 2023/10
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Refereed?: Yes, Invited?: No
3. *Ragab, A; Mannan, M; Youssef, A. (2023). Try on, Spied on? Privacy Analysis of Virtual Try-On Websites and Android Apps. Workshop on Data Privacy Management (DPM, co-located with ESORICS 2023), The Hague, Netherlands,
Conference Date: 2023/9
Paper
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Refereed?: Yes, Invited?: No
4. Stegman, J; Trottier, P; Hillier, C; Khan, H; Mannan, M. (2023). "My Privacy for their Security": Employees' Privacy Perspectives and Expectations when using Enterprise Security Software. USENIX Security Symposium, Anaheim, United States of America,
Conference Date: 2023/8
Paper
Accepted
Refereed?: Yes, Invited?: No
5. *Pagey, R; Mannan, M; Youssef, A. (2023). All Your Shops Are Belong to Us: Security Weaknesses in E-commerce Platforms. The Web Conference (WWW 2023), Austin, United States of America,
Conference Date: 2023/5
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Published
Refereed?: Yes, Invited?: No
6. *Tejaswi, B; Mannan, M; Youssef, A. (2023). All Your IoT Devices Are Belong to Us: Security Weaknesses in IoT Management Platforms. ACM Conference on Data and Application Security and Privacy (ACM CODASPY'23), Charlotte, United States of America,
Conference Date: 2023/4
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Refereed?: Yes, Invited?: No
7. *Pourali, S; *Samarasinghe, N; Mannan, M. (2022). Hidden in Plain Sight: Exploring Encrypted Channels in Android Apps. ACM Conference on Computer and Communications Security (ACM CCS 2022), Los Angeles, United States of America,
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Refereed?: Yes, Invited?: No

8. *Kapoor, P; *Pagey, R; Mannan, M; Youssef A. (2022). Silver Surfers on the Tech Wave: Privacy Analysis of Android Apps for the Elderly. EAI International Conference on Security and Privacy in Communication Networks (SecureComm), ,
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Conference Date: 2022/9
Paper
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Refereed?: Yes, Invited?: No
10. *Yu, X; *Samarasinghe, N; Mannan, M; Youssef, A. (2022). Got Sick and Tracked: Privacy Analysis of Hospital Websites. Workshop on Traffic Measurements for Cybersecurity (WTMC 2022), co-located with IEEE European Symposium on Security and Privacy (IEEE EuroS&P 2022), Italy,
Conference Date: 2022/6
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11. *Kluban, M; Mannan, M; Youssef, A. (2022). On Measuring Vulnerable JavaScript Functions in the Wild. ACM Asia Conference on Computer and Communications Security (ASIACCS 2022), Japan,
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14. *Salehi, M; Clark, J; Mannan, M. (2022). Not so Immutable: Upgradeability of Smart Contracts on Ethereum. Workshop on Trusted Smart Contracts (WTSC), co-located with Financial Cryptography and Data Security (FC 2022), ,
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15. *Samarasinghe, N; *Adhikari, A; Mannan, M; Youssef, A. (2022). Et tu, Brute? Privacy Analysis of Government Websites and Mobile Apps. The Web Conference (WWW 2022), France,
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40. Mannan M, *Shahkar A, *Pirouz A, *Rabotka V et al. (2015). Peace vs. Privacy: Leveraging Conflicting Jurisdictions for Email Security. New Security Paradigms Workshop (NSPW 2015), Netherlands (124-136), Conference Date: 2015/9
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52. Mannan M. (2008). Minimizing Threats from Flawed Security APIs: A Banking PIN Example. Workshop on Analysis of Security APIs (ASA-2), Pittsburgh, United States of America,
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Number of Contributors: 1
53. Mannan M, Van Oorschot PC et al. (2008). Privacy-Enhanced Sharing of Personal Content on the Web. World Wide Web Conference (WWW) 2008, Beijing, China (487-496). ACM,
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55. Mannan M, Van Oorschot PC et al. (2007). Security and Usability: The Gap in Real-World Online Banking. New Security Paradigms Workshop (NSPW) 2007, United States of America (1-14). ACM, Conference Date: 2007/9
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56. Mannan M, van Oorschot PC et al. (2007). Using a Personal Device to Strengthen Password Authentication from an Untrusted Computer. Financial Cryptography and Data Security (FC) 2007, Scarborough, Trinidad and Tobago (88-103). Springer, Conference Date: 2007/2
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57. Mannan M, van Oorschot PC et al. (2006). A Protocol for Secure Public Instant Messaging. Financial Cryptography and Data Security (FC) 2006, Anguilla (20-35). Springer, Conference Date: 2006/2
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58. Mannan M, van Oorschot PC et al. (2005). On Instant Messaging Worms, Analysis and Countermeasures. Workshop on Rapid Malcode (WORM) 2005, Fairfax, United States of America (2-11). ACM, Conference Date: 2005/11
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Refereed?: Yes, Invited?: No
Number of Contributors: 2
59. Mannan M, van Oorschot PC et al. (2004). Secure Public Instant Messaging: A Survey. Conference on Privacy, Security and Trust (PST) 2004, Fredericton, Canada (69-77), Conference Date: 2004/10
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First Listed Author
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Refereed?: Yes, Invited?: No
Number of Contributors: 2

Intellectual Property

Patents

1. Protection System and Method against Unauthorized Data Alteration. United States of America. US10977381B2.
Patent Status: Granted/Issued
Year Issued: 2021
Inventors: Mannan, M; *Zhao, L
This state-of-the-art anti-ransomware protection system is based on our NDSS 2019 paper. It provides data security against ransomware with the highest software privileges, including root/admin. It also protects data against deletion attacks.
2. Password Triggered Trusted Encryption Key Deletion. United States of America. US20170230179A1.
Patent Status: Granted/Issued
Year Issued: 2019
Inventors: Mannan, M; *Zhao, L
Our "Trusted Deletion" system enables (based on Gracewipe, published at NDSS 2015): triggering the hidden encryption key deletion process in a way that is indistinguishable from unlocking the hidden data; verification of the deletion process; restricting guessing of passwords used for data confidentiality; and full-memory encryption. Applications include: quick "erase" of hard disks, triggering deletion in lost/stolen laptops, cold-boot protection, erase hard disk under coercion.



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Dr. Arash Mohammadi

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
Persian	Yes	Yes	Yes	Yes	Yes

Degrees

- 2015/11 Post-doctorate, Signal Processing, University of Toronto
Supervisors: Konstantinos N. Plataniotis, 2013/12 - 2015/12
- 2013/11 Doctorate, Electrical Engineering and Computer Science, York University
Supervisors: Amir Asif, 2008/9 - 2013/11
- 2007/10 Master's Thesis, Biomedical Engineering, Amirkabir University of Technology
Supervisors: Almasganj, Farshad, 2005/9 - 2007/10
- 2005/8 Bachelor's, Electrical Engineering, University of Tehran

Recognitions

- 2022/6 Concordia University Research Award of Excellence - 5,000
Concordia University
Prize / Award
Concordia University Research Fellow for the Award in Category B – for researchers who are working towards facilitating and building upon their track record of research excellence, leadership, productivity and influence.
- 2022/2 GCS Research Chair - Tier II - 5,000
Concordia University
Prize / Award
Received Gina Cody School of Engineering (GCS) Dean's Excellence Research Award
- 2021/9 2021 IEEE 5-Minute Video Clip Context - 1,500
IEEE International Conference on Image Processing (ICIP)
Prize / Award
Third Prize at 2021 IEEE International Conference on Image Processing (ICIP) for our video entitled “Deep Learning for COVID-19 Diagnosis A to Z”
- 2020/6 Best Academic Paper Award
EEE International Conference on Prognostics and Health Management
Prize / Award
Best academic Paper Award, 2020 IEEE International Conference on Prognostics and Health Management.

- 2019/6 GCS Research Chair - Tier III - 5,000
Concordia University
Prize / Award
Concordia University, Gina Cody School of Engineering and Computer Science's Research Excellence Award, (GCS Research Chair - Tier III)
- 2019/6 GCS Teaching Excellence Award
Concordia University
Prize / Award
Concordia University, Gina Cody School of Engineering and Computer Science's Teaching Excellence Award in the New Teacher Category
- 2018/7 Concordia President's Excellence in Teaching Award - 2,000
Concordia University
Prize / Award
Concordia President's Excellence in Teaching Award in the New Teacher Category

User Profile

Research Specialization Keywords: Biomedical Signal Processing, Distributed Signal Processing, Human Machine Interfacing (HMI), Information Fusion, Internet of Things (IoT), Machine Learning (ML)/Artificial intelligence (AI), Medical Image Radiomics, Signal Processing over Networks, Statistical Signal processing, Tracking and Localization

Employment

- 2020/6 Associate Professor
Concordia Institute for Information System Engineering (CIISE), Concordia University
Full-time, Assistant Professor
Tenure Status: Tenure
- 2015/12 - 2020/6 Assistant Professor
Concordia Institute of Information System Engineering, Engineering, Concordia University
Full-time, Term, Assistant Professor
Tenure Status: Tenure Track
- 2013/12 - 2015/12 Post-doctoral Fellow
Electrical and Computer Engineering, University of Toronto
Full-time
Tenure Status: Non Tenure Track
Performing research on complex-valued dynamical systems; Designing centralized and distributed complex-valued estimation algorithms; Developing complex-valued clustering and mixture reduction algorithms.
- 2009/1 - 2013/11 Teaching Assistant
Computer Science, York University
Part-time
Tenure Status: Non Tenure Track
Tutorial Teaching Assistant (TTA) for the following courses: (i) Mobile communication (CSE-4215), 3 semesters; (ii) Signals and Systems (CSE3451), 3 semesters. Teaching Assistant for the following courses: (i) Introduction to Computer Science I (CSE1020), 3 semesters; (ii) Introduction to Computer Science II (CSE1030); (iii) Introduction to Computing for Mathematics and Statistics (CSE1560), and; (iv) Computer Use: Fundamentals (CSE1520), 2 semesters.

- 2008/9 - 2013/11
 Research Assistant
 Electrical Engineering and Computer Science, York University
 Full-time
 Tenure Status: Non Tenure Track
 Performing research on distributed signal processing algorithms for systems with non-linear dynamics.
- 2012/9 - 2012/12
 Sessional Instructor
 Electrical Engineering and Computer Science, Engineering, York University
 Full-time, Sessional, Lecturer
 Tenure Status: Non Tenure Track
 Organize lectures, teaching, mark assignments, managing and organizing laboratory classes.
- 2007/10 - 2008/9
 Research Associate
 Speech Processing, Research Center of Intelligent Signal Processing
 Development of Persian speech recognition engine/decoder. Design and performance improvement of a real time automatic Persian speech to text system

Research Funding History

Awarded [n=5]

- 2023/5 - 2028/4
 Principal Applicant
 NSERC Discovery Grant, Grant
Funding Sources:
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 Total Funding - 210,000
 Portion of Funding Received - 100
 Funding Competitive?: Yes
- 2022/8 - 2023/7
 Principal Applicant
 Mitacs cluster (6 Accelerates): "Advance Machine Learning for Medical Survival Analysis", Grant
Funding Sources:
 Mathematics of Information Technology and Complex Systems (MITACS)
 Cluster
 Total Funding - 90,000
 Portion of Funding Received - 60,000
 Funding Competitive?: Yes
- 2021/4 - 2023/4
 Principal Applicant
 Mitacs Cluster (9 Accelerates): "Advanced Signal Processing and Machine Learning for Autonomous Screening in Unconstrained Environments", Grant
Funding Sources:
 Mitacs
 Cluster
 Total Funding - 120,000
 Portion of Funding Received - 120,000
 Funding Competitive?: Yes
- 2019/11 - 2023/4
 Co-applicant
 Micro-Nets: Innovation for Defence Excellence and Security (IDEaS), Grant
Funding Sources:
 Government of Canada
 Micro-Nets: Innovation for Defence Excellence and Security (IDEaS)
 Total Funding - 1,762,116
 Portion of Funding Received - 169,500
 Funding Competitive?: Yes

Co-applicant : Fakhri Karray; Henry Leung; Konstantinos N. Plataniotis; Marina Gavrilova;
Mark Coates; Yaoping Hu; Yingxu Wang;

Principal Applicant : Svetlana Yanushkevich

2021/9 - 2022/12
Co-applicant

Canda Foundation for Innovation (CFI): "Toward Intelligent and Resilient Smart Cities with Energy-Vehicle-Human Interactions", Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

CFI

Total Funding - 1,800,000

Portion of Funding Received - 415,502

Funding Competitive?: Yes

Co-applicant : Jun Yan; Walter Lucia;

Principal Applicant : Chadi Assi

Completed [n=11]

2016/4 - 2023/4
Principal Applicant

NSERC Discovery Grant, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery Grant

Total Funding - 217,000

Portion of Funding Received - 217,000

Funding Competitive?: Yes

2022/3 - 2022/7
Principal Applicant

Mitacs Accelerates International (2 Accelerates): "Advanced Signal Processing for Directional BLE-based Indoor Localization", Grant

Funding Sources:

Mitacs

Total Funding - 30,000

Portion of Funding Received - 30,000

Funding Competitive?: Yes

2021/2 - 2022/1
Principal Applicant

Horizon Postdoctoral Fellowship, Grant

Funding Sources:

Concordia University

Horizon Postdoctoral Fellowship

Total Funding - 76,000

Portion of Funding Received - 38,000

Funding Competitive?: Yes

Co-applicant : Konstantinos N. Plataniotis

2019/5 - 2021/4
Principal Applicant

Mitacs Cluster (9 Accelerates): "Advanced Signal Processing and Machine Learning for BLE-based Indoor Localization", Grant

Funding Sources:

Mitacs

Mitacs Cluster (9 Accelerates)

Total Funding - 120,000

Portion of Funding Received - 93,333

Funding Competitive?: Yes

Co-applicant : Konstantinos N. Plataniotis

2017/9 - 2019/9

FRQNT New University Researchers Start up Program, Grant

Principal Applicant **Funding Sources:**
 Fonds de recherche du Québec - Nature et technologies (FRQNT)
 FRQNT
 Total Funding - 89,730
 Portion of Funding Received - 89,730
 Funding Competitive?: Yes

2019/2 - 2019/7
 Principal Investigator **Funding Sources:**
 NSERC-ENGAGE, Grant
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 NSERC-Engage
 Total Funding - 25,000
 Portion of Funding Received - 25,000
 Funding Competitive?: Yes

2018/5 - 2019/5
 Principal Applicant **Funding Sources:**
 ENCS Capital Research Innovation Funds (CRIF), Grant
 Concordia University
 Capital Research Innovation Funds
 Total Funding - 100,000
 Portion of Funding Received - 99,989
 Funding Competitive?: Yes
 Co-applicant : Amr Youssef; Chadi Assi; Habib Benali; Jun Yan; Lingyu Wang; Luis Rodrigues; Walter Lucia

2018/4 - 2019/4
 Principal Applicant **Funding Sources:**
 Aid to Research-Related Events Grant (ARRE), Grant
 Concordia University
 Aid to Research-Related Events Grant (ARRE)
 Total Funding - 7,500
 Portion of Funding Received - 7,500
 Funding Competitive?: Yes

2016/8 - 2017/11
 Principal Investigator **Funding Sources:**
 NSERC GRF: Signal Processing Through Graphs, Grant
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 Total Funding - 4,247
 Portion of Funding Received - 4,247
 Funding Competitive?: Yes

2017/4 - 2017/10
 Principal Applicant **Funding Sources:**
 NSERC ENGAGE, Grant
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 ENGAGE
 Total Funding - 25,000
 Portion of Funding Received - 25,000
 Funding Competitive?: Yes

2016/10 - 2017/10
 Principal Applicant **Funding Sources:**
 Aid to Research-Related Events Grant (ARRE), Grant
 Concordia University
 Total Funding - 7,500
 Portion of Funding Received - 7,500
 Funding Competitive?: Yes

Under Review [n=1]

2023/5 - 2028/4
Co-applicant

Enhancing the Resilience and Security of the Smart Grid, Grant

Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Alliance
Total Funding - 2,406,522
Portion of Funding Received - 0
Funding Competitive?: Yes

Co-applicant : Amr M.Youssef; Chadi Assi; Jun Yan; Lingyu Wang; Mohsen Ghafouri;
Principal Applicant : Mourad Debbabi

Student/Postdoctoral Supervision**Bachelor's [n=18]**

2022/10 - 2023/9
Principal Supervisor

Corinne Beaudoin-Pellerin (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/10 - 2023/9
Principal Supervisor

Karl Schroeder (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/10 - 2023/9
Principal Supervisor

Timothee Duthoit (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/10 - 2023/9
Principal Supervisor

Anonna Chowdhury (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/10 - 2023/9
Principal Supervisor

Khaled Matloub (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/10 - 2023/9
Principal Supervisor

Mathias Ho (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/5 - 2022/8
Principal Supervisor

Kshitiz Bansal (Completed) , Concordia University
Thesis/Project Title: Man Machine Interfacing via sEMG Signals
Present Position: Mitacs Globalink

2022/5 - 2022/8
Principal Supervisor

HaoTian Hong (Completed) , Concordia University
Thesis/Project Title: Man-Machine Interfacing via sEMG Signals coupled with AR/VR
Present Position: Mitacs Globalink

2022/5 - 2022/8
Principal Supervisor

Anuj Attri (Completed) , Concordia University
Thesis/Project Title: AR/VR for Man-Machine Interfacing
Present Position: Mitacs Globalink

2020/5 - 2020/8
Principal Supervisor

Yaling Wu (Completed) , Concordia University
Thesis/Project Title: Lung Cancer Radiomics: Deep Learning-based Automatic Tumor Annotation
Present Position: Student

- 2020/5 - 2021/9
Principal Supervisor Marian Maksimos (Completed) , Concordia University
Thesis/Project Title: Multiple Model Reinforcement Learning for Autonomous Systems
Present Position: Student
- 2019/5 - 2019/12
Principal Supervisor Laura Isabel Grueso (Completed) , Concordia University
Thesis/Project Title: Assistive Technologies: Design of Motion Graphics for Brain Computer Interfacing
Present Position: Industry
- 2018/5 - 2018/9
Principal Supervisor Jesse Steven Abeke (Completed) , Concordia University
Thesis/Project Title: Secure State Estimation in Smart Grids via Phasor Measurement Units
Present Position: Student
- 2018/5 - 2018/9
Principal Supervisor William Cui (Completed) , Concordia University
Thesis/Project Title: Control of a Mobile Robot Using an Advanced EEG Headset for Brain Computer Interfacing
Present Position: NSERC USRA Student
- 2018/5 - 2018/9
Principal Supervisor Suzette Slim (Completed) , Concordia University
Thesis/Project Title: Segmentation of Lung Cancer Tumors
Present Position: TRAC Student
- 2017/5 - 2017/9
Principal Supervisor Desiree Blizzard (Completed) , Concordia University
Thesis/Project Title: **Event-based Object Tracking for Intrusion Detection**
Present Position: NSERC USRA Student
- 2017/5 - 2017/9
Principal Supervisor Tim Maloney (Completed) , Concordia University
Thesis/Project Title: **Online EEG-based Brain Computer Interface for Robotic Control**
Present Position: NSRC USRA Student
- 2017/5 - 2017/8
Co-Supervisor Mohammad Nour Ghalayini (Completed) , Concordia University
Thesis/Project Title: Cooperative Unmanned Aerial Vehicles Cyber-Physical Testbed
Present Position: Student, Concordia University

Master's non-Thesis [n=1]

- 2017/9 - 2017/12
Principal Supervisor Kabir Ahmed (Completed) , Concordia University
Thesis/Project Title: Degradation Modelling/Analysis and Implementation based on NASA data
Present Position: Student, Concordia University

Master's Thesis [n=12]

- 2023/1 - 2024/12
Principal Supervisor Mary Acquah (In Progress) , Concordia University
Thesis/Project Title: Secure Distributed Estimation/Learning based on Block-Chain Technologies
Present Position: Student
- 2022/9 - 2024/8
Principal Supervisor June Sung Moon (In Progress) , Concordia University
Thesis/Project Title: Brain Computer Interfacing via Augmented Reality
Present Position: Student
- 2021/9 - 2023/8
Co-Supervisor Mansooreh Montazerin (Completed) , Concordia University
Thesis/Project Title: Gesture Recognition via High-density sEMg Signals
Present Position: Student
- 2021/1 - 2022/12
Principal Supervisor Bahar Karimi (Completed) , Concordia University
Thesis/Project Title: Autonomous Cognitive Assessment Avatar
Present Position: Student

- 2020/1 - 2021/12
Principal Supervisor
Shahin Heidarian (Completed) , Concordia University
Thesis/Project Title: Capsule Network-based COVID-19 Diagnosis and Transformer-based Lung Cancer Invasiveness Prediction via Computerized Tomography (CT) Images
Present Position: Machine Learning Scientist, Synthesis Health Intelligence Inc.
- 2019/9 - 2021/8
Co-Supervisor
Farnoush Ronaghi (Completed) , Concordia University
Thesis/Project Title: Deep Learning-based Information Fusion Frameworks for Stock Price Movement Prediction
Present Position: Data Analyst, Rakuten Kobo Inc.
- 2019/1 - 2020/12
Principal Supervisor
Mohammadamin Atashi (Completed) , Concordia University
Thesis/Project Title: Multiple Model-based Indoor Localization via Bluetooth Low Energy and Inertial Measurement Unit Sensors
Present Position: Senior Data Scientist, The Globe and Mail
- 2019/1 - 2020/12
Principal Supervisor
Raika Karimi (Completed) , Concordia University
Thesis/Project Title: Low Fatigue Designs and Deep Learning-based Classification for Motion Visual Evoked Potentials
Present Position: Machine Learning Research Engineer, Huawei
- 2018/9 - 2020/8
Principal Supervisor
Parvin Malekzadeh (Completed) , Concordia University
Thesis/Project Title: Multiple Model Bayesian Estimation for BLE-based Localization and RL-based Decision Support of Autonomous Agents
Present Position: PhD Candidate, University of Toronto
- 2018/1 - 2019/12
Co-Supervisor
Mahsa Mirgholami (Completed) , Concordia University
Thesis/Project Title: EEG-based Brain-Computer Interfaces Using Motor-Imagery Experiments
Present Position: Data Engineer, Merkle Canada
- 2016/9 - 2018/7
Principal Supervisor
Somaieh Davar (Completed) , Concordia University
Thesis/Project Title: Ternary and Hybrid Event-based Particle Filtering for Distributed State Estimation in Cyber-Physical Systems
Present Position: Surgical Innovation Fellow, McGill University
- 2016/9 - 2018/6
Principal Supervisor
Golnar Kalantar (Completed) , Concordia University
Thesis/Project Title: Advanced Signal Processing Solutions for Brain-Computer Interfaces: From Theory to Practice
Present Position: Data Scientist, Octave Group
- Doctorate [n=11]**
- 2019/9 - 2023/5
Principal Supervisor
Zohreh Hajiakhondi (In Progress) , Concordia University
Thesis/Project Title: Caching in Wireless Sensor Networks
Present Position: PhD Candidate
- 2019/5 - 2022/10
Principal Supervisor
Mohammad Salimibeni (In Progress) , Concordia University
Thesis/Project Title: Implementation of Location-based Services based on BLE Beacons
Present Position: PhD Candidate
- 2019/4 - 2023/5
Co-Supervisor
Afshin Ebita (In Progress) , Concordia University
Thesis/Project Title: Wide Area Monitoring in Smart Grids
Present Position: PhD Candidate
- 2018/9 - 2022/9
Co-Supervisor
Abolfazl Rahiminejad (In Progress) , Concordia University
Thesis/Project Title: Micro-Grid Management Systems
Present Position: PhD Candidate

2018/9 - 2023/5 Co-Supervisor	Saghar Vahidi (In Progress) , Concordia University Thesis/Project Title: Wide Area Monitoring Systems in Smart Grid Present Position: PhD Candidate
2018/6 - 2022/9 Principal Supervisor	Elaheh Rahimian (In Progress) , Concordia University Thesis/Project Title: Advanced Bio-Signal Processing for Wearable Technologies Present Position: PhD Candidate
2018/6 - 2022/9 Co-Supervisor	Soheil Zabihi (In Progress) , Concordia University Thesis/Project Title: Deep Learning for Visual Tracking Present Position: PhD Candidate
2017/9 - 2021/8 Principal Supervisor	Parnian Afshar (Completed) , Concordia University Thesis/Project Title: Capsule Network-based Radiomics: From Diagnosis to Treatment Present Position: Data Scientist II, Amazon
2016/9 - 2020/12 Principal Supervisor	Soroosh Shahtalebi (Completed) , Concordia University Thesis/Project Title: Towards effective application of data-driven learning models for assistive technologies and brain-computer interfaces. Present Position: Postdoctoral Research Fellow, Vector Institute
2016/5 - 2020/12 Co-Supervisor	Ali Al-Dulaimi (Completed) , Concordia University Thesis/Project Title: Degradation Modeling and Remaining Useful Life Estimation: From Statistical Signal Processing to Deep Learning Models. Present Position: Assistant Professor, University of Missouri
2016/1 - 2020/12 Co-Supervisor	Amir Amini (Completed) , Concordia University Thesis/Project Title: Event-triggered Consensus Frameworks for Multi-agent Systems Present Position: Engineer - MTS, MDA Ltd.

Post-doctorate [n=4]

2021/2 - 2022/1 Co-Supervisor	Amir Amini (Completed) , Concordia University Thesis/Project Title: Secure Localization via Smart Beacons in Internet of Things (IoT) Present Position: Engineer - MTS, MDA Ltd.
2021/1 - 2021/11 Co-Supervisor	Ali Al-Dulaimi (Completed) , Concordia University Thesis/Project Title: Prognostic Health Management Present Position: Assistant Professor, University of Missouri
2019/9 - 2020/1 Co-Supervisor	Farzad Amirjavid (Completed) , Concordia University Thesis/Project Title: Signal Processing and Machine Learning for BLE-based Indoor Localization Present Position: Data Scientist
2016/8 - 2017/10 Co-Supervisor	Hamidreza Sadreazami (Completed) , Concordia University Thesis/Project Title: Graph-based Signal Processing Present Position: Senior Data Scientist, Groupe Dynamite

Event Administration

2023/6 - 2024/7	Organizing Committee Member, Program Chair, IEEE International Conference on Human-Machine Systems (IEEE ICGMS), Conference, 2024/5 - 2024/5
2022/9 - 2023/7	Organizing Committee Member, Tutorials Co-Chair, 2023 IEEE Intelligent Vehicles (IV), Conference, 2023/6 - 2023/6

2022/5 - 2022/11	Sole Special Session Organizer, Signal Processing for Physiological Signals, as part of IEEE Asilomar Conference on Signals, Systems, and Computers, Conference, 2022/11 - 2022/11
2019/8 - 2021/12	Organizing Committee Member, General Co-Chair, IEEE International Conference on Autonomous Systems (ICAS), Conference, 2021/8 - 2021/8
2020/4 - 2021/10	Organizing Committee Member, Special Session Co-Chair, IEEE International Conference on Image Processing (ICIP), Conference, 2021/9 - 2021/9
2020/4 - 2021/6	Organizing Committee Member, Challenge Co-Chair, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Conference, 2021/6 - 2021/6
2020/5 - 2020/11	Sole Special Session Organizer, Statistical Signal Processing Over Networks, as part of IEEE Asilomar Conference on Signals, Systems, and Computers, Conference, 2020/11 - 2020/11
2020/5 - 2020/11	Sole Special Session Organizer, Neuro-Rehabilitation and Assistive Technologies, as part of IEEE Asilomar Conference on Signals, Systems, and Computers, Conference, 2020/11 - 2020/11
2020/4 - 2020/10	Lead Special Session Organizer, Explainable Machine Learning for Image Processing Special Session, as part of 2020 IEEE International Conference on Image Processing (ICIP), Conference, 2020/10 - 2020/10
2019/4 - 2019/11	General Co-Chair, Symposium on Advanced Bio-Signal Processing & Machine Learning for Assistive and Neuro-Rehabilitation Systems, Conference, 2019/11 - 2019/11
2019/4 - 2019/10	Lead Special Session Organizer, Explainable Machine Learning for Image Processing Special Session as part of 2019 IEEE International Conference on Image Processing (ICIP), Conference, 2019/10 - 2019/10
2019/1 - 2019/6	Organization & Technical Committee Member, Autonomy and Intelligence in Robotic Rehabilitation and Assistive Technologies as as part of 2019 RehabWeek, Workshop, 2019/6 - 2019/6
2018/1 - 2018/10	General Co-Chair, Symposium on Advanced Bio-Signal Processing and Machine Learning for Medical Cyber-Physical Systems, Conference, 2018/10 - 2018/10
2018/4 - 2018/9	Lead Organizer, 2018 IEEE Video and Image Processing (VIP) Cup, Conference, 2018/12 - 2018/12
2017/1 - 2017/11	General Co-Chair, Symposium on Advanced Bio-Signal Processing for Rehabilitation & Assistive Systems, Conference, 2017/11 - 2017/11
2017/2 - 2017/10	Lead Special Session Organizer, Bio-Signal Processing for Movement Assessment, Neuro-Rehabilitation & Assistive Technologies, Conference, 2017/10 - 2017/10

Editorial Activities

2022/9 - 2025/8	Associate Editor (AE), International Journal of Digital Human, Journal
2021/11 - 2024/12	Associate Editor (AE), Nature Scientific Reports, Journal
2020/1 - 2023/12	Associate Editor (AE), IEEE Signal Processing Letters, Journal
2019/9 - 2021/4	Guest Editor (GE), IEEE Signal Processing Magazine (SPM), Special Issue entitled "Signal Processing for Neurorehabilitation and Assistive Technologies", Journal
2017/1 - 2020/7	Associate Editor (AE), IET Signal Processing, Journal
2016/12 - 2018/3	Lead Guest Editor (LGE), IEEE Transactions on Signal and Information Processing over Networks, Journal

International Collaboration Activities

2022/1 - 2024/12	Research Collaborator, Australia Research collaboration with Prof. Hamid Alinejad Rokny from University of New South Wales, (UNSW Sydney), Sydney, Australia on Graph-Learning techniques to analyze electronic health records.
2021/7 - 2023/12	Research Collaborator, United States of America Research collaboration with Prof. E. Mark Haacke from Wayne State University, Detroit, Michigan, USA, on development of signal processing and machine learning solutions for diagnosis based on MRI images.
2021/6 - 2023/12	Research Collaborator, United States of America Research collaboration with Prof. Reza Taleei from Thomas Jefferson University Hospitals, Philadelphia, PA United States, on development of prognostic signal processing and machine learning models.
2019/9 - 2023/12	Research Collaborator, United Kingdom Research collaboration with Prof. Dario Farina from Imperial Collage London, Imperial College London, London, United Kingdom, on development of signal processing and machine learning solutions to advance human machine interfacing.
2019/1 - 2022/12	Research Collaborator, United States of America Research collaboration with Prof. S. Farokh Atashzar from New York University (NYU), New York, NY, United States, on development of signal processing and machine learning models for Rehabilitation and Assistive Systems.
2017/6 - 2022/7	Research Collaborator, United States of America Research collaboration with Prof. Mohseni from Case Western Reserve University, Cleveland, OH, USA on development of advance processing solutions for cuff-less blood pressure estimation based on a new device developed in the BioMicroSystems Lab.
2018/6 - 2021/12	Research Collaborator, United States of America Research collaboration with Dr. Keyvan Farahani from National Cancer Institute (NCI), USA, on development of signal processing and machine learning solutions for Medical Image Radiomics.
2019/5 - 2020/12	Research Collaborator, United States of America Research collaboration with Dr. Ehsan Saeidpour and Prof. Kenneth Loparo from Case Western Reserve University, Cleveland, OH, United States, on application of signal processing techniques for load demand response forecasting in Smart Grids.

Committee Memberships

2022/1	Chair, Academic Committee Chair, Canadian Medical and Biological Engineering Society (CMBES)
2018/9	Committee Member, IEEE System, Man, and Cybernetics (SMC) Technical committee on "Brain-Inspired Cognitive Systems", IEEE
2016/8	Co-chair, Montreal Chapter, IEEE Signal Processing Society (SPS)
2022/9 - 2024/8	Committee Member, Steering Committee of EEE Autonomous Systems Initiative (ASI), IEEE Signal Processing Society (SPS)
2019/1 - 2021/12	Committee Member, IEEE Signal Processing Society (SPS) Student Services Committee, IEEE

2018/1 - 2021/12	Committee Member, Membership Board of IEEE Signal processing Society (SPS), Institute of Electrical and Electronics Engineers (IEEE) Voting member of IEEE Signal processing Society (SPS) Membership Board
2018/1 - 2021/12	Chair, (Director) Membership Services Developments of IEEE Signal Processing Society (SPS), Institute of Electrical and Electronics Engineers (IEEE) Elected as the Director Membership Services of IEEE Signal Processing Society (SPS) and chair of the associated committee.
2018/1 - 2021/12	Committee Member, Publication Board of Signal processing Society (SPS), Institute of Electrical and Electronics Engineers (IEEE) Member (non-voting) of IEEE Signal processing Society (SPS) Publication Board
2018/1 - 2021/12	Committee Member, Conference Board of IEEE Signal Processing Society (SPS), Institute of Electrical and Electronics Engineers (IEEE) Voting member of IEEE Signal Processing (SPS) Conference Board.

Other Memberships

2022/6 - 2023/12	Committee Member, Concordia University Gina Cody School (GCS), Funding Adjudication Committee
2022/4 - 2023/12	Committee Member, Concordia University Gina Cody School (GCS), Faculty Optimization Program (FOP) Committee
2022/2 - 2023/12	Committee Member, Concordia University Gina Cody School (GCS), Research Grant Committee
2021/4 - 2022/12	Committee Member, Concordia University Concordia University Human Research Ethics Committee (UHREC)
2021/1 - 2022/12	Committee Member, Concordia University Concordia University, SGS Graduate Awards/Prizes Adjudication Committees
2021/1 - 2022/12	Committee Member, Concordia University President's Excellence in Teaching Award (PETA) Committee
2017/8 - 2019/8	Committee Member, Concordia University ENCS Faculty Health and Safety Committee
2017/3 - 2019/3	Committee Member, Concordia University ENCS Faculty Council

Presentations

- (2022). Biological Signal Processing and Machine Learning: From Brain Computer Interfaces (BCI) to Cancer/COVID-19 Radiomics. Seminar Series of University of New South Wales (UNSW Sydney), Graduate School of Biomedical Engineering, Australia
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
- (2022). Signal Processing (SP) and Machine Learning (ML) for Brain Computer Interfacing (BCI) & Brain MRI Analysis. PERFORM/BIC Research Retreat, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No

3. (2021). On Future Development of Autonomous Systems. Plenary Panel at IEEE International Conference on Autonomous Systems (ICAS), Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
4. (2021). Deep Learning for Diagnosis/Prognosis of COVID-19 Chest Images. engAGE / PERFORM Research Retreat, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
5. (2020). IEEE Signal Processing Society (SPS) Membership Preview. IEEE Signal Processing Society (SPS), Canada
Main Audience: General Public
Invited?: Yes, Keynote?: Yes
6. (2020). Advanced Biological Signal Processing and Machine Learning Systems. Canadian Society of Iranian Engineers & Architects, Toronto, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: Yes
7. (2019). Distributed, Event-based, and Secure Multi-Agent Autonomous Systems. IEEE SPS AutoDefense Winter School on Autonomous Systems, Ottawa, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
8. (2018). Advanced Signal Processing & Machine Learning for Hybrid Brain Computer Interfacing and Pathological Tremor Extraction. Toronto Rehabilitation Institute Seminar Series, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes

Publications

Journal Articles

1. S. Afshar, M. Roshanzamir, H. Asgharnezhad, A. Mohammadi, H. Alinejad-Rokny. (2023). A Novel Uncertainty-aware Skin Cancer Diagnosis based on Deep Learning. *Neural Computing and Applications*. 35: 22179–2218.
Published
Refereed?: Yes, Open Access?: No
2. S. Zabihi*, E. Rahimian*, A. Asif, A. Mohammadi. (2023). TraHGR: Transformer for Hand Gesture Recognition via ElectroMyography. *IEEE Transactions on Neural Systems & Rehabilitation Engineering*. 31: 4211-4224.
Published
Refereed?: Yes, Open Access?: Yes
3. G. Kianfar, M. Azadi, J. Abouei, A. Mohammadi, K.N. Plataniotis. (2023). Wireless Body Area NanoNetworks via Vascular Molecular Communication. *IEEE Transactions on NanoBioscience*.
Revision Requested
Refereed?: Yes, Open Access?: No
4. X. Liu, F. Deng, W. Wei, X. Zhao, A. Mohammadi. (2023). Consensus Tracking of Networked Stochastic Multi-Agent Systems with Adaptive Fault-Tolerant Control under Markovian Switching. *IEEE Transactions on Control of Network Systems*.
Submitted
Refereed?: Yes, Open Access?: No

5. N. Enshaei, F. Naderkhani, F. Berger, S. Mubareka, V. Campos, K. Narang, V. Thayalasuthan, A. Mohammadi, A. Oikonomou. (2023). Differentiation of COVID-19 from non-COVID Seasonal Viral Infections on Baseline Chest Radiographs: Comparison of a Deep Learning Model with Multireader Evaluation. *Radiology*.
Submitted
Refereed?: Yes, Open Access?: No
6. X. Liu, F. Deng, W. Wei, X. Zhao, A. Mohammadi. (2023). Fault-tolerant Tracking Control of Networked Stochastic Heterogeneous Multi-Agent Systems with Communication Time-Delay. *IEEE Transactions on Circuits and Systems II: Express Briefs*.
Submitted
Refereed?: Yes, Open Access?: No
7. S. Vahidi*, A. Amini, M. Ghafouri, M. Au, A. Mohammadi, and M. Debbabi. (2023). Resilient Periodic Observer-based Event-Triggered Wide-Area Controller For Oscillation Damping Against Time Synchronization Attacks in WAMPAC Systems. *IEEE Transactions on Industrial Informatics*.
Revision Requested
Refereed?: Yes, Open Access?: No
8. Z. HajiAkhondi*, A. Mohammadi, J. Abouei, and K.N. Plataniotis,. (2023). CLSA: Contrastive Learning-based Survival Analysis for Popularity Prediction in MEC Networks. *IEEE Internet of Things (IoT) Journal*.
Accepted
Refereed?: Yes, Open Access?: No
9. A. Rahiminezhad*, M. Ghafouri, R. Atallah, W. Lucia, M. Debbabi, and A. Mohammadi. (2023). Resilience Enhancement of Islanded Microgrid by Diversification, Reconfiguration, and DER Placement/Sizing. *International Journal of Electrical Power & Energy Systems*. 147
Published
Refereed?: Yes, Open Access?: No
10. M. Montazerin*, E. Rahimian*, F. Naderkhani, S. Farokh Atashzar, S. Yanushkevich, A. Mohammadi. (2023). Hand Gesture Recognition with High-Density Electromyogram Signals via Transformer Architecture. *Nature Scientific Reports*. 13
Published
Refereed?: Yes, Open Access?: Yes
11. A. Ebita*, M. Ghafouri, M. Debbabi, A. Mohammadi. (2023). Spatial-Temporal Data-Driven Model for Load Altering Attack Detection in Smart Power Distribution Networks. *IEEE Transactions on Industrial Informatics*.
Revision Requested
Refereed?: Yes, Open Access?: No
12. S. Vahidi*, M. Ghafouri, M. Au, M. Kassouf, A. Mohammadi, and M. Debbabi. (2022). Security of Wide-Area Monitoring, Protection and Control (WAMPAC) Systems: A Survey on Challenges and Opportunities. *IEEE Communications Surveys and Tutorials*. 25(2): 1294-1335.
Published
Refereed?: Yes, Open Access?: No
13. B. Karimi*, S. Zabihi*, A. Keynia, A. Montazami, A. Mohammadi. (2022). AVCA: Autonomous Virtual Cognitive Assessment. *Transactions on Computational Science*.
Published
Refereed?: Yes, Open Access?: No
14. N. Enshaei, A. Oikonomou, M.J. Rafiee, P. Afshar*, S. Heidarian*, A. Mohammadi, K.N. Plataniotis, and F. Naderkhani. (2022). COVID-Rate: An Automated Framework for Segmentation of COVID-19 Lesions from Chest CT Images. *Nature Scientific Reports*. 12(1)
Published
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Published
Refereed?: Yes, Invited?: No
29. Z. Hajiakhondi*, M. Salimibeni*, A. Mohammadi, and, K.N. Plataniotis. (2021). Bluetooth Low Energy and CNN-based Angle of Arrival Localization in Presence of Rayleigh Fading. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
30. B. Sarhadi, J. Abouei, Z. Hajiakhondi*, A. Mohammadi, and K. N. Plataniotis. (2021). Streaming Compression Multimedia Data over WMSNs based on Fairness Cluster-based Routing Protocol. IEEE International Conference on Systems, Man, and Cybernetics (SMC),
Paper
Published
Refereed?: Yes, Invited?: No
31. E. Rahimian*, S. Zabihi*, A. Asif, S.F. Atashzar, and A. Mohammadi. (2021). Few-Shot Learning for Decoding Surface Electromyography for Hand Gesture Recognition. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
32. A. Al-Dulaimi*, A. Asif, and A. Mohammadi. (2020). Multipath Parallel Hybrid Deep Neural Networks Framework for Remaining Useful Life Estimation. IEEE International Conference on Prognostics and Health Management (PHM),
Paper
Published
Refereed?: Yes, Invited?: No
33. E. Rahimian*, S. Zabihi*, S.F. Atashzar, Amir Asif, and A. Mohammadi. (2020). XceptionTime: Independent Time-Window xceptiontime architecture for hand gesture classification.IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), (1304-1308)
Paper
Published
Refereed?: Yes, Invited?: No

34. Y. Wang, S.N. Yanushkevich, M. Hou, K.N. Plataniotis, M. Coates, M. Gavrilova, Y. Hu, F. Karray, H. Leung, A. Mohammadi, S. Kwong, E.W. Tunstel, L. Trajkovic, I.J. Rudas, J. Kacprzyk. (2020). A Tripartite Theory of Trustworthiness for Autonomous Systems. IEEE International Conference on Systems, Man, and Cybernetics (SMC),
Paper
Published
Refereed?: Yes, Invited?: Yes
35. M. Asadi, J. Abouei, Z. Hajiakhondi*, M. Mazidi, and A. Mohammadi. (2020). FDIA Detection through an Adaptive Multi- Level Features Classification in Smart Grids. IEEE International Conference on Systems, Man, and Cybernetics (SMC),
Paper
Published
Refereed?: Yes, Invited?: No
36. A. Al-Dulaimi*, A. Mohammadi, and A. Asif. (2020). Remaining Useful Life Estimation via Hybrid of NBGRU and CNN. Institute of Industrial & Systems Engineers (IISE) Annual Conference & Expo,
Paper
Published
Refereed?: Yes, Invited?: No
37. A. Amini*, A. Asif, and A. Mohammadi. (2020). Dynamic Event-triggered Formation Control for Multi-agent Systems: A Co-design Optimization Approach. IEEE American Control Conference (ACC),
Paper
Published
Refereed?: Yes, Invited?: No
38. Z. Hajiakhondi*, M. Salimibeni*, K. N. Plataniotis, and A. Mohammadi. (2020). Bluetooth Low Energy-based Angle of Arrival Estimation via Switch Antenna Array for Indoor Localization. IEEE International Conference on Information Fusion,
Paper
Published
Refereed?: Yes, Invited?: No
39. P. Afshar*, A. Oikonomou, K.N. Plataniotis, and A. Mohammadi. (2020). MDR-SURV: a Multi-scale Deep Learning-based Radiomics for SURVival Prediction in Pulmonary Malignancies. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
40. P. Afshar*, K. N. Plataniotis, and A. Mohammadi. (2020). BoostCaps: A Boosted Capsule Network for Brain Tumor Classification. IEEE Engineering in Medicine and Biology Conference (EMBC),
Paper
Published
Refereed?: Yes, Invited?: No
41. P. Malekzadeh*, S. Mehryar, P. Spachos, K.N. Plataniotis, A. Mohammadi. (2020). Non-Gaussian BLE-based Indoor Localization via Gaussian Sum Filtering Coupled with Wasserstein Distances. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: Yes

42. F. Ronaghi*, M. Salimibeni*, F. Naderkhani, and A. Mohammadi. (2020). ND-SMPF: A Noisy Deep Neural Network Fusion Framework for Stock Price Movement Prediction. IEEE International Conference on Information Fusion,
Paper
Published
Refereed?: Yes, Invited?: No
43. A. Al-Dulaimi*, A. Mohammadi, and A. Asif. (2020). Noisy Parallel, Hybrid Model for Remaining Useful Life Estimation (NPHM). Institute of Industrial & Systems Engineers (IISE) Annual Conference & Expo,
Paper
Published
Refereed?: Yes, Invited?: No
44. M. Salimibeni*, P. Malekzadeh*, K.N. Plataniotis, and A. Mohammadi. (2020). Distributed Hybrid Kalman Temporal Differences for Reinforcement Learning. IEEE Asilomar Conference on Signals, Systems, and Computers,
Paper
Published
Refereed?: Yes, Invited?: Yes
45. R. Karimi*, L. Rosero*, Amir Asif, and A. Mohammadi. (2020). Deep Video Canonical Correlation Analysis for Steady State motion Visual Evoked Potential Feature Extraction. European Signal Processing Conference (EUSIPCO),
Paper
Published
Refereed?: Yes, Invited?: No
46. M. Salimibeni*, Z. Hajiakhondi*, P. Malekzadeh*, M.A. Atashi*, K.N. Plataniotis, A. Mohammadi. (2020). IoT-TD: IoT Dataset for Multiple Model BLE-based Indoor Tracking. European Signal Processing Conference (EUSIPCO),
Paper
Published
Refereed?: Yes, Invited?: No
47. M.A. Atashi*, M. Salimibeni*, P. Malekzadeh*, Z. Hajiakhondi*, K.N. Plataniotis, A. Mohammadi. (2020). Orientation- Matched Multiple Modeling for RSSI-based Indoor Localization via BLE Sensors. European Signal Processing Conference (EUSIPCO),
Paper
Published
Refereed?: Yes, Invited?: No
48. E. Rahimian*, S. Zabihi*, A. Asif, and A. Mohammadi. (2020). Hybrid Deep Neural Networks for Sparse Surface EMG-Based Hand Gesture Recognition. IEEE Asilomar Conference on Signals, Systems, and Computers,
Paper
Published
Refereed?: Yes, Invited?: Yes
49. Z. Hajiakhondi*, M. Salimibeni*, A. Mohammadi, and K.N. Plataniotis. (2020). Bluetooth Low Energy-based Angle of Arrival Estimation in Presence of Rayleigh Fading. IEEE International Conference on Systems, Man, and Cybernetics (SMC),
Paper
Published
Refereed?: Yes, Invited?: No

50. S. Shahtalebi*, A. Asif, A. Mohammadi. (2020). Siamese Neural Networks for EEG-based Brain-computer Interfaces. IEEE Engineering in Medicine and Biology Conference (EMBC),
Paper
Published
Refereed?: Yes, Invited?: No
51. A. Amini*, A. Asif, and A. Mohammadi. (2019). Quantized Event-triggered Sampled-data Average Consensus with Guaranteed Rate of Convergence. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
52. M. Salimibeni*, P. Malekzadeh*, M.A. Atashi*, M. Barbulescu, K.N. Plataniotis, A. Mohammadi. (2019). Event-Triggered Monitoring/Communication of Inertial Measurement Unit for IoT Applications. IEEE Sensors,
Paper
Published
Refereed?: Yes, Invited?: No
53. E. Rahimian*, S. Zabihi*, A. Asif, and A. Mohammadi. (2019). sEMG-Based Hand Gesture Recognition via Dilated Convolutional Neural Networks. IEEE Global Signal Processing Conference (GlobalSIP),
Paper
Published
Refereed?: Yes, Invited?: No
54. P. Afshar*, K.N. Plataniotis, and A. Mohammadi. (2019). Capsule Networks for Brain Tumor Classification based on MRI Images and Course Tumor Boundaries. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
55. M.A. Atashi*, M. Salimibeni*, P. Malekzadeh*, M. Barbulescu, K.N. Plataniotis, A. Mohammadi. (2019). Multiple Model BLE-based Tracking via Validation of RSSI Fluctuations Under Different Conditions. IEEE International Conference on Information Fusion,
Paper
Published
Refereed?: Yes, Invited?: No
56. P. Afshar*, K.N. Plataniotis, and A. Mohammadi. (2019). Explainable Capsule Networks for Cancer Radiomics. IEEE International Conference on Image Processing (ICIP),
Paper
Published
Refereed?: Yes, Invited?: Yes
57. S. Shahtalebi*, S.F. Atashzar, R.V. Patel, A. Mohammadi. (2019). Training of Deep Bidirectional RNNs for Hand Motion Filtering via Multimodal Data Fusion. IEEE Global Signal Processing Conference (GlobalSIP),
Paper
Published
Refereed?: Yes, Invited?: No
58. A. Amini*, A. Azarbahram, A. Mohammadi, and A. Asif. (2019). Resilient Event-triggered Average Consensus Under Denial of Service Attack and Uncertain Network. IEEE International Conference on Control, Decision and Information Technologies (CoDIT),
Paper
Published
Refereed?: Yes, Invited?: Yes

59. A. Amini*, Z. Zeinali, A. Asif, and A. Mohammadi. (2019). Performance Constrained Distributed Event-triggered Consensus in Multi-agent Systems. IEEE American Control Conference (ACC),
Paper
Published
Refereed?: Yes, Invited?: No
60. M. Mirgholami*, S. Shahtalebi*, R. Karimi*, A. Asif, and A. Mohammadi. (2019). Adaptive Subject-Specific Bayesian Spectral Filtering for Single Trial EEG Classification. IEEE Global Signal Processing Conference (GlobalSIP),
Paper
Published
Refereed?: Yes, Invited?: No
61. P. Malekzadeh*, M. Salimibeni*, M.A. Atashi*, M. Barbulescu, K.N. Plataniotis, A. Mohammadi. (2019). Gaussian Mixture- Based Indoor Localization via Bluetooth Low Energy Sensors. IEEE Sensors,
Paper
Published
Refereed?: Yes, Invited?: No
62. R. Karimi*, L. Rosero*, M. Mirgholami*, Amir Asif, and A. Mohammadi. (2019). Study on Novel Designs with Reduced Fatigue for Steady State Motion Visual Evoked Potentials. IEEE Global Signal Processing Conference (GlobalSIP),
Paper
Published
Refereed?: Yes, Invited?: No
63. A. Al-Dulaimi*, S. Zabihi*, A. Asif, and A. Mohammadi. (2019). A Hybrid Deep Neural Network Framework for Estimating Remaining Useful Life in Prognostic Health Management Industrial Applications. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
64. S. Shahtalebi* and A. Mohammadi. (2019). Feature Space Reduction for Single Trial EEG Classification based on Wavelet Decomposition. IEEE International Engineering in Medicine and Biology Conference (EMBC),
Paper
Published
Refereed?: Yes, Invited?: No
65. S. Mehryar, P. Malekzadeh*, S. Mazuelas, P. Spachos, K.N. Plataniotis, and A. Mohammadi. (2019). Belief Condensation Filtering for RSSI-based State Estimation in Indoor Localization. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: Yes
66. G. Kalantar*, A. Mohammadi, N. Sadrieh. (2018). Analyzing the Effect of Bluetooth Low Energy (BLE) with Randomized MAC Addresses in IoT Applications. IEEE International Conference on Internet of Things (iThings),
Paper
Published
Refereed?: Yes, Invited?: No

67. G. Kalantar*, M. Mirgholami*, Amir Asif, and A. Mohammadi. (2018). Improving the Performance of Motor Imagery EEG-based BCIs via an Adaptive Epoch Trimming Mechanism. IEEE Global Signal Processing Conference (GlobalSIP),
Paper
Published
Refereed?: Yes, Invited?: No
68. A. Amini*, A. Mohammadi, A. Asif. (2018). Resilient Event-Triggered Consensus with Exponential Convergence in Multi-agent Systems. IEEE American Control Conference (ACC),
Paper
Published
Refereed?: Yes, Invited?: No
69. P. Afshar*, A. Shahroudnejad, A. Mohammadi. (2018). CARISI: Convolutional Autoencoder-based Inter-Slice Interpolation of Brain Tumor Volumetric Images. IEEE International Conference on Image Processing (ICIP),
Paper
Published
Refereed?: Yes, Invited?: No
70. S. Davar*, A. Mohammadi, K. Plataniotis. (2018). Autonomous and self-aware systems, Autonomous Vehicles, Event-triggered estimation, Particle filtering. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP): Special Session on Signal Processing for Autonomous and Self Aware systems,
Paper
Published
Refereed?: Yes, Invited?: Yes
71. A. Amini*, A. Asif, A. Mohammadi. (2018). A Robust Event-Triggered Consensus Strategy for Linear Multiagent Systems with Uncertain Network Topology. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
72. A. Al-Dulaimi*, A. Mohammadi, A. Asif. (2018). Interactive Multiple Model Particle Filters for Generalized Degradation Path Modeling. Institute of Industrial & Systems Engineers (IISE) Annual Conference & Expo,
Paper
Published
Refereed?: Yes, Invited?: No
73. A. Shahroudnejad, P. Afshar*, K.N. Plataniotis, and A. Mohammadi. (2018). Improved Explainability of Capsule Networks: Relevance Path by Agreement. IEEE Global Conference on Signal and Information Processing,
Paper
Published
Refereed?: Yes, Invited?: No
74. G. Kalantar*, S. Mukhopadhyay, F. Marefat, P. Mohseni, A. Mohammadi. (2018). WAKE-BPAT: Wavelet based Adaptive Kalman Filtering for Blood Pressure Estimation via Fusion of Pulse Arrival Times. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No

75. A. Amini*, A. Asif, A. Mohammadi. (2018). An Event-triggered Average Consensus Algorithm with Performance Guarantees for Distributed Sensor Networks. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
76. V. Khorasani, A. Mohammadi, S. Atashzar, R. Patel. (2018). Multiple-Model and Reduced-Order Kalman Filtering for Pathological Hand Tremor Extraction. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
77. S. Shahtalebi*, A. Mohammadi. (2018). A Bayesian Framework to Optimize Double Band Spectra Spatial Filters for Motor Imagery Classification. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
78. P. Afshar*, A. Mohammadi, K. Plataniotis. (2018). Tumor Classification via Capsule Nets. IEEE International Conference on Image Processing (ICIP),
Paper
Published
Refereed?: Yes, Invited?: No



Protected when completed

Date Submitted: 2024-03-28 19:20:41

Confirmation Number: 1760404

Template: NSERC_Researcher

Professor Farnoosh Naderkhani

Correspondence language: English

Contact Information

The primary information is denoted by (*)

Address

Primary Affiliation (*)

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EV007.635
Montreal Quebec H3G 1MB
Canada

Telephone

Mobile 1-438-5206508

Work (*) 1-514-8482424

Email

Work (*) farnoosh.naderkhani@concordia.ca



Protected when completed

Professor Farnoosh Naderkhani

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
Persian	Yes	Yes	Yes	Yes	Yes
Turkish	Yes	Yes	Yes	Yes	Yes

Degrees

- 2018/6 Post-doctorate, Industrial and Systems Engineering, Georgia Institute of Technology
Supervisors: Dr. Kamran Paynabar, 2017/9 - 2018/6
- 2017/6 Doctorate, Industrial Engineering, University of Toronto
Supervisors: Prof. Viliam Makis, 2012/1 - 2017/6
- 2009/6 Bachelor's, Industrial Engineering, University of Tehran

Recognitions

- 2023/9 Concordia University Research Award of Excellence - 5,000
Concordia University
Prize / Award
Concordia University Research Fellow for the Award in Category A
- 2023/8 Gina Cody School's Teaching Excellence Award
Concordia University
Prize / Award
Recipient of Gina Cody School of Engineering and Computer Science Teaching Excellence Award in the New Teacher Category
- 2022/5 - 2024/4 Gina Cody Research and innovation Fellowship - 40,000
Concordia University
Prize / Award
Awarded the Gina Cody School of Engineering and Computer Science's Research and Innovation Fellowship Award
- 2017/9 - 2019/9 NSERC Postdoctoral Fellowship (NSERC-PDF) - 90,000
Georgia Institute of Technology
Prize / Award
Postgraduate Scholarship

User Profile

Research Specialization Keywords: Condition Monitoring, Diagnosis/Prognosis Analysis, Predictive Monitoring, Quality Control, Reliability, Survival Analysis

Employment

- 2023/6 Associate Professor
Concordia Institute for Information System Engineering (CIISE), Concordia University
Full-time
Tenure Status: Tenure
- 2018/7 Assistant Professor
Concordia Institute of Information System Engineering, Concordia University
Full-time
Tenure Status: Tenure Track
- 2017/9 - 2018/6 Post-doctoral fellow
Industrial and Systems Engineering, Georgia Institute of Technology
Full-time
Tenure Status: Non Tenure Track
- 2011/9 - 2017/6 Research Assistant
Mechanical and Industrial Engineering (MIE), University of Toronto
Full-time
Tenure Status: Non Tenure Track
Performing research on quality control in economic design of multivariate Bayesian control chart and developing optimal maintenance policy for a partially observable system subject to stochastic degradation.
- 2013/1 - 2016/6 Research Intern and Project Lead
Mechanical and Industrial Engineering (MIE), University of Toronto
Part-time
Tenure Status: Non Tenure Track
Collaborative research program between University of Toronto (U of T) and Bombardier Aerospace Inc. to perform research on different areas such as improving the efficiency of Operations.
- 2011/9 - 2016/5 Teaching Assistant
Mechanical and Industrial Engineering (MIE), University of Toronto
Part-time
Tenure Status: Non Tenure Track
Tutorial and lab teaching assistant for the following courses: (i) MIE364: Methods of Quality Control & Improvement, 4 semesters; (ii) MIE1727H: Statistical Methods of Quality Assurance, 1 semester; (iii) MIE360: Systems Modelling and Simulation, 2 semesters; (iv) MIE367: Cases in Operational Research, 3 semesters.
- 2011/9 - 2012/9 Collaborative Research Assistant
Mechanical and Industrial Engineering (MIE), University of Toronto
Part-time
Tenure Status: Non Tenure Track
Performing research on a collaborative research program between University of Toronto (U of T) and Ministry of Transportation Ontario (MTO) on developing a stochastic approach to model and forecast highway collisions in winter time.

Leaves of Absence and Impact on Research

- 2021/1 - 2022/1 Parental, Concordia University
Maternity Leave: January 2021 to January 2022.

Research Funding History

Awarded [n=5]

- 2023/1 - 2024/12
Principal Applicant
Gina Cody Research & Innovation Fellowship, Grant
Funding Sources:
Concordia University
Total Funding - 40,000
Portion of Funding Received - 40,000
Funding Competitive?: Yes
- 2019/4 - 2024/3
Principal Applicant
Natural Sciences and Engineering Research Council of Canada- ECR supplement, Grant
Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Total Funding - 12,500
Portion of Funding Received - 12,500
Funding Competitive?: Yes
- 2019/4 - 2024/3
Principal Applicant
Natural Sciences and Engineering Research Council of Canada (NSERC)- Discovery Grant (NSERC DG), Grant
Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Total Funding - 130,000
Portion of Funding Received - 13,000
Funding Competitive?: Yes
- 2021/11 - 2023/10
Principal Applicant
Mitacs Cluster, Grant
Funding Sources:
Mathematics of Information Technology and Complex Systems (MITACS) Cluster
Total Funding - 107,000
Portion of Funding Received - 107,000
Funding Competitive?: Yes
- 2021/5 - 2023/4
Co-investigator
Sunnybrook AFP Innovation Fund, Grant
Funding Sources:
Sunnybrook Hospital
Total Funding - 100,000
Portion of Funding Received - 40,000
Funding Competitive?: Yes

Completed [n=2]

- 2018/12 - 2020/12
Principal Applicant
Concordia Start-Up Grant, Grant
Funding Sources:
Concordia University
Total Funding - 50,000
Portion of Funding Received - 50,000
Funding Competitive?: No
- 2017/9 - 2018/6
Principal Applicant
Natural Sciences and Engineering Research Council of Canada (NSERC)-Post doctoral Fellowship (NSERC-PDF), Fellowship
Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Total Funding - 90,000

Portion of Funding Received - 90,000
Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's non-Thesis [n=6]

2020/1 - 2020/5 Academic Advisor	Maryam Raza (Completed) , Concordia University Thesis/Project Title: Application of Advanced Machine Learning Solutions in Quality Control Present Position: Flight science intern at Bombardier Aerospace Inc.
2020/1 - 2020/5 Principal Supervisor	Misha Kindarji (Completed) , Concordia University Thesis/Project Title: Canada Post Process Optimization Present Position: Principal Implementation Project Manager, Ceridian
2020/1 - 2020/5 Principal Supervisor	Uday Tatareddy (Completed) , Concordia University Thesis/Project Title: Detail Walk Through of Predicting Remaining Useful Life using Machine Learning and Deep Learning Present Position: ETL Developer, Wipro
2019/9 - 2019/12 Principal Supervisor	Houman Esmaili Burekheyl (Completed) , Concordia University Thesis/Project Title: Maintenance Management in Aviation Present Position: Data Management Analyst, Pratt & Whitney
2019/5 - 2019/8 Principal Supervisor	Sahil Bohat (Completed) , Concordia University Thesis/Project Title: Deep Learning-based Predictive Maintenance Present Position: Data Scientist, Industry
2018/9 - 2019/5 Principal Supervisor	Hamid Ahmadpanah (Completed) , Concordia University Thesis/Project Title: Fault Detection of a Hydraulic Test Rig based on Real Multi-Sensor Data Present Position: Master Student

Master's Thesis [n=8]

2022/9 - 2025/12 Principal Supervisor	Marzieh Saadat (In Progress) , Concordia University Thesis/Project Title: Prognostic Health Management via Active Learning Solutions Present Position: PhD Student, Concordia University
2022/1 - 2023/9 Principal Supervisor	Mehrnaz Salmani (In Progress) , Concordia University Thesis/Project Title: Deep Neural Networks for Maintenance Management Present Position: Student, Concordia University
2021/9 - 2023/8 Co-Supervisor	Mansooreh Montazerin (Completed) , Concordia University Thesis/Project Title: Deep Learning Methods for Hand Gesture Recognition via High-Density Surface Electromyogram (HD-sEMG) Signals Present Position: PhD Student, University of Southern California
2021/1 - 2023/9 Principal Supervisor	Mehrnaz Mirzaei (In Progress) , Concordia University Thesis/Project Title: Deep Learning-based Reliability Analysis Present Position: Student, Concordia University
2019/9 - 2021/9 Principal Supervisor	Kamyar Azar (Completed) , Concordia University Thesis/Project Title: Hybrid Statistical, Machine Learning, and Deep Learning Models for Fault Diagnosis and Prognosis in Condition-based Maintenance Present Position: Data Scientist, Playground

2019/9 - 2021/8 Co-Supervisor	Farnoush Rounaghi (Completed) , Concordia University Thesis/Project Title: Deep Learning-based Predictive Analysis Present Position: Data Analyst, Rakuten Kobo Inc.
2019/1 - 2021/5 Principal Supervisor	Negar Ghodsi (Completed) , Concordia University Thesis/Project Title: Optimal control of supply chain network with disruption Present Position: Operations Scheduler, Vention Inc.
2019/1 - 2021/5 Principal Supervisor	Safwan Ahmad (Completed) , Concordia University Thesis/Project Title: Hybrid Statistical and Deep Learning Models for Diagnosis and Prognosis in Manufacturing Systems Present Position: Data Specialist, VIA

Doctorate [n=3]

2022/1 - 2025/12 Principal Supervisor	Hengameh Hadian (In Progress) , Concordia University Thesis/Project Title: Condition-based Maintenance via Industrial Internet-of-Things Present Position: PhD Student, Concordia University
2022/1 - 2025/12 Principal Supervisor	Soroosh Shahsafi (In Progress) , Concordia University Thesis/Project Title: Artificial Intelligence-based Predictive Analytics Present Position: PhD Student, Concordia University
2019/5 - 2023/12 Principal Supervisor	Nastaran Enshaei (In Progress) , Concordia University Thesis/Project Title: Radiomics-based Diagnostics and Prognostics Present Position: PhD Candidate, Concordia University

Event Administration

2023/1 - 2023/8	Organizer, GCS GirlSet, Workshop, 2023/1 - 2023/8
2022/1 - 2022/8	Organizer, GCS GirlSet, Workshop, 2022/1 - 2022/8
2021/3 - 2021/3	Lead Special Panel Organizer, Young Women in Engineering, Seminar, 2021/3 - 2021/3
2020/1 - 2020/8	Organizer, GCS GirlSet, Workshop, 2020/1 - 2020/8
2019/9 - 2019/9	Lead Special Panel Organizer, The Future Talent of Quality, Seminar, 2019/9 - 2019/9
2019/1 - 2019/8	Organizer, GCS GirlsSet, Workshop, 2019/1 - 2019/8
2019/2 - 2019/4	Organizer, Sustainable Feet-on-the-Ground Humanitarian Technology, Seminar, 2019/4 - 2019/4
2019/1 - 2019/3	Organizer, Many Faces of Quality Networking, Seminar, 2019/3 - 2019/3
2018/4 - 2018/10	Competition Jury Member, 2018 IEEE Video and Image Processing (VIP) Cup, Conference, 2018/10 - 2018/10
2016/9 - 2017/6	Graduate Student Union Representative, Elected Member of the Association of Mechanical and Industrial Engineering graduate students (AMIGAS)., Association, 2009/9 - 2018/9

Committee Memberships

- 2019/1 Committee Member, Leadership Board of American Society for Quality (ASQ) Montreal Section, American Society for Quality (ASQ)
I serve as the Student Outreach Committee Chair in Montreal section of the ASQ since January 2019 due to my recent involvements, contributions, and activities within the ASQ Society. ASQ is the world's premier professional society for quality scientists and professionals.
- 2021/1 - 2023/12 Committee Member, IEEE Reliability Society Administrative Committee (AdCom), IEEE Reliability Society (RS)
- 2021/1 - 2023/12 Committee Member, Student Achievement Award Committee, IEEE Reliability Society (RS)
- 2022/8 - 2023/7 Chair, Program Chair and Local arrangement Chair, 2023 IEEE International Prognostic and Health Management (PHM) Conference
I am serving as a Program Chair at 2023 IEEE International Conference on Prognostic and Health Management (PHM), which is a Flagship Conference of "IEEE Reliability Society". The conference will be held at Concordia University in June 2023.
- 2021/8 - 2022/7 Chair, Program Chair, 2022 IEEE International Prognostic and Health Management (PHM) Conference
I was serving as the Program Chair of 2022 IEEE International Conference on Prognostic and Health Management, which is a Flagship Conference of "IEEE Reliability Society".
- 2020/8 - 2021/7 Chair, Paper Review Chair, 2021 IEEE International Prognostic and Health Management (PHM) Conference
Given success of the 2020 IEEE PHM Conference, I was invited to serve as the Paper Review Chair (Technical Program Chair) for the 2021 PHM.
- 2019/8 - 2021/7 Chair, Local Arrangement Chair, 2021 IEEE International Conference on Autonomous Systems (IEEE ICAS)
I was serving as the Local Arrangement Co-Chair of 2021 IEEE International Conference on Autonomous Systems (ICAS'21), which was a new Flagship Conference of "IEEE Signal Processing Society (SPS)".
- 2019/8 - 2020/7 Co-chair, Paper Review Vice-Chair, 2020 IEEE International Prognostic and Health Management (PHM) Conference
I was the Paper Review Chair (Technical Program Chair) at 2020 IEEE International Conference on Prognostic and Health Management (PHM), which is a Flagship Conference of "IEEE Reliability Society".

Other Memberships

- 2022/11 Member, Concordia University
Member of SGS Horizon Postdoctoral Fellowship Review Committee: I am serving as a member of SGS Horizon Postdoctoral Fellowship Review Committee at Concordia University since November 2022.
- 2021/9 Member, Concordia University
Member of Concordia Applied AI Institute: I am serving as a member of Concordia Applied AI Institute.
- 2021/1 Member, Concordia University
Member of Thermal Spray and Surface Engineering (TSSE) Research Centre: I am serving as a member of Thermal Spray and Surface Engineering (TSSE) Research Centre at Concordia University since 2021.

Publications

Journal Articles

1. Montazerin, M. Rahimian, E. Naderkhani, F. Atashzar, S.F. Yanushkevich, S. Mohammadi, A. (2023). Transformer-based Hand Gesture Recognition via High-Density EMG Signals: From Instantaneous Recognition to Fusion of Motor Unit Spike Trains. *Nature Scientific Reports*.
Revision Requested
Refereed?: Yes, Open Access?: Yes
2. Azar, K. Naderkhani, F. (2023). Haz-Net: Deep Learning-based Cox's Proportional Hazard Network for Maintenance Applications. *IEEE Transactions on Reliability*.
Revision Requested
Refereed?: Yes, Open Access?: No
3. Rasay, H. Naderkhani, F. Azizi, F. (2023). A Mathematical Maintenance Model for a Production System Subject to Deterioration According to a Stochastic Geometric Process. *Annals of Operations Research*.
Submitted
Refereed?: Yes, Open Access?: No
4. Khademi, S. Heidarian, S. Afshar, P. Enshaei, N. Naderkhani, N. Rafiee, M.J. Oikonomou, A. Shafiee, A. Babaki Fard, F. Plataniotis, K.N. Mohammadi, A. (2023). Robust Framework for COVID-19 Identification from a Multicenter Dataset of Chest CT Scans. *Plos One*. 18(3)
Published
Refereed?: Yes, Open Access?: Yes
5. Enshaei, N. Paul, P. Tremblay, S. Naderkhani, F. Ebadi, A. (2023). A Deep Learning-based Automatic Meter Reading System for Real-time Gas Consumption Monitoring “, under review in *Energy Journal*.
Energy Journal.
Submitted
Refereed?: Yes
6. Rasay, H. Azizi, F. Salmani, M. Naderkhani, F. (2023). Joint Optimization of Condition-based Maintenance and Production Rate using Reinforcement Learning Algorithms. *Applied Mathematical Modeling*.
Submitted
Refereed?: Yes, Open Access?: No
7. Naderkhani, F. (2022). Time to Signal Distribution of Multivariate Bayesian Control Chart with Dual Sampling Scheme. *International Journal of Production Research (IJPR)*. 60(20): 6124-614.
Published
Refereed?: Yes
8. Azar, K. Naderkhani, K. (2022). Semi-supervised clustering-based method for fault diagnosis and prognosis: A case study. *Reliability Engineering & System Safety*. 222
Published
Refereed?: Yes, Open Access?: No
9. Rounaghi, F. Salimibeni, M. Naderkhani, F. Mohammadi, A. (2022). COVID19-HPSMP: COVID-19 Adopted Hybrid and Parallel Deep Information Fusion Framework for Stock Price Movement Prediction. *Expert Systems with Applications*. 187
Published
Refereed?: Yes, Open Access?: No
10. Afshar, P. Rafiee, M.J. Naderkhani, F. Heidarian, F. Enshaei, F. Oikonomou, A. Babaki Fard, F. Anconina, R. Farahani, K. Plataniotis, K.N. Mohammadi, A. (2022). Human-level COVID-19 Diagnosis from Lowdose CT Scans Using a Two-stage Time-distributed Capsule Network. *Nature Scientific Reports*. 12
Published
Refereed?: Yes, Open Access?: Yes

11. Rassay, H. Naderkhani, F. (2022). Mathematical Maintenance Model for Manufacturing Systems under Depredations According to a Stochastic Geometric Process. *Applied Mathematical Modeling*. Submitted
Refereed?: Yes, Open Access?: No
12. Rassay, H. Naderkhani, F. Azizi, F. (2022). Opportunistic Maintenance Integrated Model for a Two-stage Manufacturing Process. *International Journal of Advanced Manufacturing Technology*. 119: 8173–8191. Published
Refereed?: Yes, Open Access?: No
13. Enshaei, N. Afshar, P. Heidarian, S. Oikonomou, A. Plataniotis, K.N. Rafiee, M.J. Mohammadi, A. Naderkhani, F. (2022). COVID-Rate: An Automated Framework for Segmentation of COVID-19 Lesions from Chest CT Scan. *Nature Scientific Report*. 12
Published
Refereed?: Yes, Open Access?: Yes
14. Mohammadi, A. Wang, Y. Enshaei, N. Afshar, P. Naderkhani, F. Oikonomou, A. Rafiee, M.J. Yanushkevich, S. Oliveira, H.C.R. Plataniotis, K.N. (2021). Diagnosis/Prognosis of COVID-19 Chest Images via Machine Learning and Hypersignal Processing: Challenges, opportunities, and applications. *IEEE Signal Processing Magazine (SPM)*. 38(5)
Published
Refereed?: Yes, Open Access?: No
15. Heidarian, S. Afshar, P. Enshaei, N. Naderkhani, F. Oikonomou, A. Atashzar, S.F. Babaki Fard, F. Samimi, K. Plataniotis, K.N. Mohammadi, A. Rafiee, M.J. (2021). COVID-FACT: A Fully-Automated Capsule Network-based Framework for Identification of COVID-19 Cases from Chest CT scans. *Frontiers in Artificial Intelligence*. 4
Published
Refereed?: Yes, Open Access?: Yes
16. Afshar, P. Heidarian, S. Enshaei, N. Naderkhani, F. Rafiee, M.J. Oikonomou, A. Babaki Fard, F. Samimi, K. Plataniotis, K.N. Mohammadi, A. (2021). COVID-CT-MD: COVID-19 Computed Tomography (CT) Scan Dataset Applicable in Machine Learning and Deep Learning. *Nature Scientific Data*. 8(121)
Published
Refereed?: Yes, Open Access?: Yes
17. Afshar, P. Naderkhani, F. Oikonomou, A. Rafiee, M.J. Mohammadi, A. Plataniotis, K.N. (2021). MIXCAPS: A Capsule Network-based Mixture of Experts for Lung Nodule Malignancy Prediction. *Pattern Recognition*. 116
Published
Refereed?: Yes, Open Access?: No
18. Afshar, P. Heidarian, S. Naderkhani, F. Plataniotis, K.N. Mohammadi A. (2020). COVID-CAPS: A Capsule Network-based Framework for Identification of COVID-19 Cases from X-ray Images. *Pattern Recognition Letter*. 138: 638-643.
Published
Refereed?: Yes
19. Rassay, H. Naderkhani, F. Golmohammadi, A.M. (2020). Designing Variable Sampling Plans based on Lifetime Performance Index under Failure Censoring Reliability Tests. *Journal of Quality Engineering*. 32(3): 354-370.
Published
Refereed?: Yes, Open Access?: No
20. Afshar, P. Oikonomou, A. Naderkhani, F. Tyrrell, P.N. Plataniotis, K.N. Farahani K. Mohammadi, A. (2020). 3D-MCN: A 3D Multi-scale Capsule Network for Lung Nodule Malignancy Prediction. *Nature Scientific Report*.
Published
Refereed?: Yes, Open Access?: Yes

21. Jafari, L., Naderkhani, F., and Makis, V. (2018). Joint Optimization of Maintenance Policy and Inspection Interval for a Two-units Series System using Proportional Hazards Model. Journal of the Operational Research Society. 69(1): 36-48.
Published
Refereed?: Yes, Open Access?: No

Book Chapters

1. Ghodsi, N. Naderkhani, F. Awashti, A. (2021). Optimal Control Policy for a Partially Observable Facility under Stochastic Disruption. Fleet Management and Planning for Sustainable Connected Mobility Systems. : 1-23.
Published, IGI Global
Refereed?: Yes
2. Enshaei, N. Naderkhani, F. (2019). A Comprehensive Review on Advanced Maintenance Strategies for Smart Railways. Interdisciplinary Approaches to Decision Making for Sustainable Supply Chains. : 1-19.
Published, IGI Global
Refereed?: Yes

Conference Publications

1. Mirzaei, M. Saadat, M. Naderkhani, F. (2023). Application of Machine Learning for Anomaly Detection in Printed Circuit Boards Imbalance Data Set. IEEE Conference on Prognostics and Health Management (ICPHM),
Paper
Accepted
Refereed?: Yes, Invited?: Yes
2. Khademi, S. Heidarian, S. Afshar, P. Naderkhani, F. Oikonomou, A. Plataniotis, K.N. Mohammadi, A. (2023). Spatio-Temporal Hybrid Fusion of CAE and SWIn Transformers for Lung Cancer Malignancy Prediction. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Accepted
Refereed?: Yes, Invited?: No
3. Hadian, H. Naderkhani, F. (2023). Deep Learning-Based Models for Wind and Solar Curtailment Forecasting. International Conference on Energy Harvesting, Storage, and Transfer (EHST),
Paper
Accepted
Refereed?: Yes, Invited?: No
4. Montazerin, M. Rahimian, E. Naderkhani, F. Atashzar, S.F. Alinejad-Rokny, H. Mohammadi, A. (2023). HYDRA-HGR: A Hybrid Transformer-based Architecture for Fusion of Macroscopic and Microscopic Neural Drive Information. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Accepted
Refereed?: Yes, Invited?: No
5. Rasay, H. Azizi, F. Salmani, M. Naderkhani, F. (2023). A Reinforcement Learning Algorithm for Optimal Dynamic Policies of Joint Condition-based Maintenance. IEEE Conference on Prognostics and Health Management (ICPHM),
Paper
Accepted
Refereed?: Yes, Invited?: No

6. Rasay, H. Naderkhani, F. (2022). Reinforcement Learning based on Stochastic Dynamic Programming for Condition-based Maintenance of Deteriorating Production Processes. IEEE International Conference on Prognostics and Health Management, Paper
Published
Refereed?: Yes, Invited?: No
7. Montazerin, M. Zabihi, S. Rahimian, E. Mohammadi, A. Naderkhani, F. (2022). ViT-HGR: Vision transformer-based hand gesture recognition from high density surface EMG signals. 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), Paper
Published
Refereed?: Yes, Invited?: No
8. Enshaei, N. Rafiee, M.J. Mohammadi, A. Naderkhani, F. (2022). Data Shapley Value for Handling Noisy Labels: An application in Screening COVID-19 Pneumonia from Chest CT Scans,. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Paper
Published
Refereed?: Yes, Invited?: No
9. Salmani, M. Azizi, F. Rasay, H. Naderkhani, F. (2022). Dynamic Maintenance for Large Scale Identical Parallel Manufacturing Systems Using Reinforcement Learning. The 69th Annual Reliability & Maintainability Symposium (RAMS® 2023), Paper
Published
Refereed?: Yes, Invited?: No
10. Enshaei, N. Rafiee, M.J. Naderkhani, F. (2022). A Generalization Enhancement Approach for Deep Learning Segmentation Models: Application in COVID-19 Lesion Segmentation from Chest CT Images. European Signal Processing Conference (EUSIPCO), Paper
Published
Refereed?: Yes, Invited?: No
11. Azizi, F. Rasay, H. Naderkhani, F. (2022). Dynamic Maintenance of Continuously Monitored Parallel Systems. IEEE International Conference on Prognostics and Health Management (PHM), Paper
Published
Refereed?: Yes, Invited?: No
12. Heidarian, S. Afshar, P. Naderkhani, F. Rafiee, M.J. Oikonomou, A. Plataniotis, K.N. Mohammadi, A. (2021). Hybrid Deep Learning Model for Diagnosis of COVID-19 using CT Scans and Clinical/Demographic Data. IEEE International Conference on Image Processing (ICIP), Paper
Published
Refereed?: Yes, Invited?: No
13. Heidarian, S. Afshar, P. Enshaei, N. Naderkhani, F. Rafiee, M.J. Oikonomou, A. Babaki Fard, F. Shafiee, A. Plataniotis, K.N. Mohammadi, A. (2021). WSO-CAPS: Diagnosis Of Lung Infection From Low And Ultra-Lowdose CT Scans Using Capsule Networks And Windowsetting Optimization. IEEE International Conference on Autonomous Systems (ICAS), Paper
Published
Refereed?: Yes, Invited?: No

14. Heidarian, S. Afshar, P. Mohammadi, A. Rafiee, M.J. Oikonomou, A. Plataniotis, K.N. Naderkhani, F. (2021). CT-CAPS: Feature Extraction-based Automated Framework for COVID-19 Disease Identification from Chest CT Scans using Capsule Networks. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: Yes
15. Enshaei, N. Afshar, P. Heidarian, S. Mohammadi, A. Rafiee, M.J. Oikonomou, F.A. Babaki Fard, F. Plataniotis, K.N. Naderkhani, F. (2021). An Ensemble Learning Framework For Multi-Class Covid-19 Lesion Segmentation From Chest Ct Images. IEEE International Conference on Autonomous Systems (ICAS),
Paper
Published
Refereed?: Yes, Invited?: Yes
16. Rasay, H. Naderkhani, F. (2021). Comparison of Two Maintenance Policies for the Coordination of Decisions of Quality Control and Maintenance Planning. IEEE International Conference on Prognostics and Health Management,
Paper
Published
Refereed?: Yes, Invited?: Yes
17. Azar, K. Naderkhani, F. (2020). Semi-Supervised Learning Approach for Optimizing Condition-based-Maintenance (CBM) Decisions. IEEE International Conference on Prognostics and Health Management,
Paper
Published
Refereed?: Yes, Invited?: No
18. Enshaei, N. Naderkhani, F. (2020). Application of Deep Learning for Fault Diagnostic in Induction Machine's Bearings. IEEE International Conference on Prognostics and Health Management,
Paper
Published
Refereed?: Yes, Invited?: No
19. Ronaghi, F. Salimibeni, M. Naderkhani, F. Mohammadi, A. (2020). ND-SMPF: A Noisy Deep Neural Network Fusion Framework for Stock Price Movement Prediction. IEEE International Conference on Information Fusion,
Paper
Published
Refereed?: Yes, Invited?: No
20. Enshaei, N. Ahmad, S. Naderkhani, F. (2020). Automated detection of textured-surface defects using UNet-based semantic segmentation network. IEEE International Conference on Prognostics and Health Management,
Paper
Published
Refereed?: Yes, Invited?: No
21. Ahmad, S. Enshaei, N. Awasthi, A. Naderkhani, F. (2020). Integrated Deep Learning and Statistical Process Control for Online Monitoring of Manufacturing Processes. IEEE International Conference on Prognostics and Health Management,
Paper
Published
Refereed?: Yes, Invited?: No

22. Rasay, H. Naderkhani, F. (2020). Designing a Reliability Quick Switching Sampling Plan based on the Lifetime Performance Index. IEEE International Conference on Prognostics and Health Management, Paper
Published
Refereed?: Yes, Invited?: No
23. Ghodsi, N. Naderkhani, F. Awasthi, A. (2019). Application of Markov Decision Process in Facility Location under Disruption. Canadian Operation Research Conference (CORS), Paper
Published
Refereed?: Yes, Invited?: No
24. Ahmad, S. Naderkhani, F. Awasthi, A. (2019). Deep Learning Based Survival Analysis. Canadian Operation Research Conference (CORS), Paper
Published
Refereed?: Yes, Invited?: No



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Dr. Zachary Patterson

Correspondence language: English

Contact Information

The primary information is denoted by (*)

Address

Mailing

1455, blvd. De Maisonneuve ouest
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Dr. Zachary Patterson

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes

Degrees

- 2008/8 Post-doctorate, Transportation Land-use Modeling, Ecole polytechnique fédérale de Lausanne
Supervisors: Michel Bierlaire, 2006/10 - 2008/9
- 2007/2 Doctorate, Freight Transportation Modeling and the Environment, McGill University
Supervisors: Gordon Ewing, 2003/8 - 2006/5
- 2000/5 Master's Thesis, Transportation/Environmental Economics, Simon Fraser University
Supervisors: Nancy Olewiler, 1997/9 - 2000/5
- 1997/5 Bachelor's, Economic Anthropology, McGill University
Supervisors: Laurel Bossen, 1993/9 - 1997/5

User Profile

Research Specialization Keywords: emerging data, computational geoprocessing, discrete choice experiments, energy use, passenger transportation, passenger travel behaviour, stated preference tech., transp. and environment, transp. land-use modeling, transportation economics

Employment

- 2023/6 Professor
Concordia Institute for Information Systems Engineering, Sir George Williams, Concordia University
Full-time, Professor
Tenure Status: Tenure
- 2021/6 - 2023/6 Associate Professor
Concordia Institute for Information Systems Engineering, Gina Cody School of Business, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure

2016/6 - 2021/5	Associate Professor Geography, Planning and Environment, Faculty of Arts & Sciences, Concordia University Full-time, Associate Professor Tenure Status: Tenure
2010/8 - 2016/5	Assistant Professor Geography, Concordia University Full-time Tenure Status: Tenure Track
2008/9 - 2010/5	Modeling Specialist Information sur la mobilité et transport métropolitain, Agence métropolitaine de transport, Montreal
2007/9 - 2008/6	Co-managing director Urban Utility Management, École Polytechnique Fédérale de Lausanne
2003/9 - 2006/5	PhD Candidate Geography, McGill University Full-time Tenure Status: Non Tenure Track
2005/1 - 2005/5	Teaching Assistant Geography, McGill University Part-time Tenure Status: Non Tenure Track
2004/9 - 2004/12	Teaching Assistant Geography, McGill University Part-time Tenure Status: Non Tenure Track
2004/1 - 2004/5	Teaching Assistant Geography, McGill University Part-time Tenure Status: Non Tenure Track
2000/10 - 2003/8	Economist Environment, Economy and Trade, Commission for Environmental Cooperation
2000/5 - 2000/9	Junior Economist Transportation and Energy Use Division, Natural Resources Canada
1999/1 - 1999/8	Teaching Assistant Economics, Simon Fraser University Part-time Tenure Status: Non Tenure Track

Research Funding History

Awarded [n=6]

2023/5 - 2030/4 Collaborator	Bridging Divides: Migrant Integration in the mid-21st Century, Grant Funding Sources: Canada First Research Excellence Fund Total Funding - 99,253,482 Portion of Funding Received - 2,800,000 Funding Competitive?: Yes
2022/5 - 2027/4	Graph Neural Networks for Transit Passenger Flow Prediction, Grant

Principal Investigator	<p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 180,000 Portion of Funding Received - 180,000 Funding Competitive?: Yes</p>
2021/1 - 2027/2 Principal Investigator	<p>Micro Transit Demand Management (microTDM) - AI & Transit Operations, Grant</p> <p>Funding Sources: Mitacs iPDF Total Funding - 900,000 Portion of Funding Received - 735,000 Funding Competitive?: No</p>
2020/5 - 2027/2 Principal Investigator	<p>Micro Transit Demand Management (microTDM) with Big Data and Artificial Intelligence, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 1,426,666 Portion of Funding Received - 1,336,666 Funding Competitive?: Yes</p> <p>Co-investigator : Nizar Bouguila; Owen Waygood</p>
2018/5 - 2024/4 Co-applicant	<p>Canadian Urban Environmental Health Research Consortium (CANUE), Grant</p> <p>Funding Sources: Canadian Institutes of Health Research (CIHR) Total Funding - 4,200,000 Portion of Funding Received - 60,000 Funding Competitive?: Yes</p> <p>Co-applicant : Dan Rainham; Greg Evans;</p> <p>Principal Applicant : Howard Hu; Jeffrey Brook; Kim Mcgrail; Michael Brauer; Padmaja Subarrao; Philip Awadalla</p>
2021/3 - 2022/4 Principal Investigator	<p>Développement d'indicateurs d'accessibilité pour la production d'analyses multimodales et non comparatives (R860.1), Contract</p> <p>Funding Sources: Ministère des Transports (Québec) Total Funding - 86,000 Portion of Funding Received - 86,000 Funding Competitive?: No</p>
Completed [n=14]	
2022/1 - 2022/12 Principal Investigator	<p>Graph Neural Networks for Transit Data Imputation, Grant</p> <p>Funding Sources: Concordia University Next Generation Cities Institute Total Funding - 5,000 Portion of Funding Received - 5,000 Funding Competitive?: Yes</p>
2021/11 - 2022/5 Principal Applicant	<p>Anticipation de mouvement des usagers dans l'espace d'une intersection avec feu de circulation à partir de données de sources multiples, Grant</p>

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Explore

Total Funding - 5,000

Portion of Funding Received - 5,000

Funding Competitive?: Yes

2021/11 - 2022/5
Principal Applicant

Modélisation de mobilité à l'aide de jumeaux numériques, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Explore

Total Funding - 5,000

Portion of Funding Received - 5,000

Funding Competitive?: Yes

2017/3 - 2021/3
Co-applicant

Time, Geography, and Food: How time use, social-spatial context, transportation options, and personal economics affect access to food in cities, Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

Insight Grants

Total Funding - 264,305

Portion of Funding Received - 25,000

Funding Competitive?: Yes

Co-applicant : Jason Gililand; Leia Minaker; Steven Farber;

Collaborator : Kristian Larsen;

Principal Applicant : Michael Widener

2018/7 - 2018/12
Principal Applicant

MTL Trajet 2018 - A Smartphone Travel Survey, Contract

Funding Sources:

Ville de Montréal

Total Funding - 23,000

Portion of Funding Received - 23,000

Funding Competitive?: No

2016/5 - 2018/4
Principal Applicant

The DataMobile Partnership: An Open Platform for Spatialized Data Collection and Analysis, Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

Partnership Development Grants

Total Funding - 297,736

Portion of Funding Received - 120,000

Funding Competitive?: Yes

Co-applicant : Benoit Lavigne; Bilal Farooq; Jean-François Cantin; Michael Widener; Steven Farber;

Collaborator : Pierre Tremblay

2017/3 - 2018/3
Principal Applicant

The DataMobile Platform - Research Dissemination and Outreach, Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

Connection Grants

Total Funding - 40,306

Portion of Funding Received - 40,306

2017/7 - 2017/12
Principal Applicant

Funding Competitive?: Yes

MTL Trajet 2017 - A Smartphone Travel Survey, Contract

Funding Sources:
Ville de Montréal
Total Funding - 20,000
Portion of Funding Received - 20,000
Funding Competitive?: No

2017/6 - 2017/12
Principal Applicant

MTL Trajet 2017 - A Smartphone Travel Survey App, Contract

Funding Sources:
Ville de Montreal
Research Contract
Total Funding - 23,000
Portion of Funding Received - 20,000
Funding Competitive?: No

2016/7 - 2017/12
Principal Investigator

CFSMobile - A GPS travel component to the Canada Food Study, Contract

Funding Sources:
University of Waterloo
PHAC: Public Health Agency of Canada Innovation Strategy
Total Funding - 12,650
Portion of Funding Received - 12,650
Funding Competitive?: No

2017/7 - 2017/12
Principal Applicant

City Logger, Contract

Funding Sources:
UofT Transportation Research Institute
TTS 2.0
Total Funding - 20,000
Portion of Funding Received - 17,000
Funding Competitive?: Yes

2016/11 - 2017/11
Principal Applicant

THE DATAMOBILE PLATFORM WORKSHOP, Grant

Funding Sources:
Concordia University
Aid to research related events
Total Funding - 4,910
Portion of Funding Received - 4,910
Funding Competitive?: Yes

2016/11 - 2017/10
Principal Applicant

Aid to Research-related Events for the Itinerum Platform Workshop, Grant

Funding Sources:
Concordia University
Aid to Research-related Events
Total Funding - 5,000
Portion of Funding Received - 5,000
Funding Competitive?: Yes

2016/6 - 2017/6
Principal Applicant

CANADA RESEARCH CHAIR - TIER 2 IN TRANSPORTATION AND LAND USE LINKAGES FOR REGIONAL SUSTAINABILITY - SUPPORT FOR INFRASTRUCTURE UPGRADES, Research Chair

Funding Sources:
Concordia University
SUPPORT FOR INFRASTRUCTURE UPGRADES

Total Funding - 30,000
 Portion of Funding Received - 30,000
 Funding Competitive?: No

Student/Postdoctoral Supervision

Bachelor's [n=2]

- 2022/5 - 2022/9
Co-Supervisor Raghav Narula (Mitacs Globalink Intern) (All But Degree) , Thapar Institute of Engineering and Technology
 Student Degree Expected Date: 2023/5
 Thesis/Project Title: Variational graph convolution network with normalizing flows for passenger flow prediction.
 Present Position: Undergraduate Student
- 2022/5 - 2022/9
Co-Supervisor Mohamed Chaaben (Mitacs Globalink Intern) (Completed) , École Supérieure des communications de Tunis
 Thesis/Project Title: Short-Term Bus Passenger Flow Prediction Using Multi-Component Graph Attention Neural Network Model
 Present Position: Master's student (Concordia Institute for Information Systems Engineering)

Bachelor's Honours [n=4]

- 2020/5 - 2021/8
Principal Supervisor Aaron Bensmihen (Completed) , Concordia University
 Thesis/Project Title: The Multimodal Accessibility Benchmark and Innovation in Canadian Cities.
 Present Position: Master's of Urban Planning Student (McGill University), McGill University - Urban Planning
- 2019/5 - 2020/8
Principal Supervisor Scott McCallum (Completed) , Concordia University
 Thesis/Project Title: Google Location History and Activity Space Stabilization.
 Present Position: Product Owner, MobilityData, MobilityData IO
- 2019/5 - 2021/4
Principal Supervisor Ben Azoulay (Completed) , Concordia University
 Thesis/Project Title: Standardized Reporting Guidelines for Smartphone Travel Surveys.
 Present Position: Area Manager, Amazon, Amazon
- 2017/2 - 2020/5
Principal Supervisor Phillip Veilleux (Completed) , Concordia University
 Thesis/Project Title: GTFS and Transit Accessibility Measures.
 Present Position: Senior Analyst, Canada Mortgage and Housing Corporation, Canada Mortgage and Housing Corporation

Master's Equivalent [n=1]

- 2016/5 - 2018/12
Principal Supervisor Megan Chan (Completed) , Concordia University
 Thesis/Project Title: Applications of smartphone transportation data collection to EIA
 Present Position: Invoicing Representative, Traffic Tech, Traffic Tech

Master's non-Thesis [n=2]

- 2022/11 - 2023/4
Co-Supervisor Mina Amiripour (Completed) , Concordia University
 Thesis/Project Title: Cloud-base Monitoring and Alerting IoT System
 Present Position: Engineer at BusPas, Inc.

2021/9 - 2022/9
Co-Supervisor Kimia Jourabchi (Completed) , Concordia University
Thesis/Project Title: Deep learning for trajectory analysis at intersections with digital twins
Present Position: Quality Control Specialist, Expresco, Concordia University

Master's Thesis [n=15]

2023/9 - 2025/8
Principal Supervisor Isaac Otchere (In Progress) , Concordia University
Student Degree Expected Date: 2025/8
Thesis/Project Title: Long-term residential and mode choice patterns with smartphone travel survey applications
Present Position: Master's student, Concordia Institute for Information Systems Engineering

2023/7 - 2025/6
Co-Supervisor Nadira Nipa (In Progress) , Concordia University
Student Degree Expected Date: 2025/6
Thesis/Project Title: Data fusion and security
Present Position: Master's student, Concordia Institute for Information Systems Engineering

2023/1 - 2024/12
Co-Supervisor Mohamed Chaaben (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Non-zero inflated Graph Neural Network for Transit Passenger Flow Prediction
Present Position: Master's student, Concordia Institute for Information Systems Engineering

2022/10 - 2023/12
Co-Supervisor Pardis Ghaziamin (Completed) , Concordia University
Thesis/Project Title: AI for computer vision for video analysis for passenger counting at bus stops
Present Position: Master's student, Concordia Institute for Information Systems Engineering

2022/10 - 2023/12
Co-Supervisor Farnaz Kashefinshabouri (Completed) , Concordia University
Thesis/Project Title: Deep learning approaches to Smart Bus Stop energy demand forecasting and management
Present Position: Master's student, Concordia Institute for Information Systems Engineering

2021/9 - 2022/12
Principal Supervisor Sneha Paul (Completed) , Concordia University
Thesis/Project Title: Data modeling and fusion for the development of digital twins of intersections
Present Position: PhD Student, Concordia Institute for Information Systems Engineering, Concordia University

2020/10 - 2021/12
Co-Supervisor Vemuri, Ravi (Completed) , Concordia University
Thesis/Project Title: Bayesian methods for traffic count estimations with video data at intersections
Present Position: Machine Learning Fellow, Fellowship.AI (San Francisco), Concordia University - CIISE

2020/10 - 2022/9
Co-Supervisor Baghdadi, Ali (Completed) , Concordia University
Thesis/Project Title: Load-factor forecasting with online APC and AVL data
Present Position: Senior Cloud Specialist, CGI, Concordia University - CIISE

2020/9 - 2022/9
Co-Supervisor Wood, Hannah (Completed) , Concordia University
Thesis/Project Title: Load-factor forecasting with historical APC and AVL data
Present Position: Cloud Solution Architect, Microsoft, Concordia University - CIISE

2020/5 - 2024/5 Principal Supervisor	Gavin Hermanson (All But Degree) , Concordia University Student Degree Expected Date: 2024/5 Thesis/Project Title: Multimodal accessibility measures in transportation planning Present Position: Transportation Planner, City of New Westminster, Concordia University - Department of Geography
2020/1 - 2021/9 Co-Supervisor	Laffont, Pierre Christophe Marc (Completed) , Polytechnique Montréal Thesis/Project Title: Electrical vehicle forecast requirements to meet CO2 emission goals in Montreal Present Position: Data Analyst, Exo - Réseau de transport métropolitain, Polytechnique Montréal - Civil Engineering
2017/8 - 2018/8 Co-Supervisor	Zhang, Qi (Completed) , Concordia University Thesis/Project Title: Machine learning for information inference from smartphone travel survey data Present Position: Biostatistician, Jewish General Hospital (Montreal), Lady Davis Institute for Medical Research
2017/4 - 2018/8 Co-Supervisor	Akbarzadeh, Hannah (Withdrawn) , Concordia University Thesis/Project Title: Information inference from smartphone travel survey data Present Position: Unknown, Unknown
2017/1 - 2017/5 Co-Supervisor	Hamouni, Parham (Completed) , Concordia University Thesis/Project Title: Information inference from smartphone travel survey data Present Position: Senior Data Scientist, The Kraft Heinz Company, Concordia University
2015/11 - 2017/5 Co-Supervisor	Rezaei, Mohsen (Completed) , Concordia University Thesis/Project Title: Travel mode inference from data collected with smartphone travel survey applications Present Position: Data Engineer - Machine Learning, CGI, Concordia University

Doctorate [n=14]

2024/1 - 2026/12 Principal Supervisor	Farbod Abbasi (In Progress) , Concordia University Student Degree Expected Date: 2026/12 Thesis/Project Title: Deep Learning in Travel Behaviour Analysis and Simulation Present Position: PhD Student, Concordia Institute for Information Systems Engineering
2024/1 - 2026/12 Co-Supervisor	Eric Agyemang (In Progress) , Concordia University Student Degree Expected Date: 2026/12 Thesis/Project Title: Federated Learning in Autonomous IOT Devices Present Position: PhD Student, Concordia Institute for Information Systems Engineering
2024/1 - 2026/12 Principal Supervisor	Houman Haghi (In Progress) , Concordia University Student Degree Expected Date: 2026/12 Thesis/Project Title: Deep Learning Methods in Residential Location Choice Modelling and Simulation Present Position: PhD Student, Concordia Institute for Information Systems Engineering
2023/9 - 2027/8 Principal Supervisor	Mahan Mollajafari (In Progress) , Concordia University Student Degree Expected Date: 2027/8 Thesis/Project Title: Modeling of long-term residential and mode choice decisions of new Canadians Present Position: PhD Student, Concordia Institute for Information Systems Engineering

2023/9 - 2026/12 Co-Supervisor	Amin Fattahi (In Progress) , Polytechnique de Montréal Student Degree Expected Date: 2026/12 Thesis/Project Title: Willingness to Pay for GHG Emissions Reduction in Residential Location Choice Present Position: PhD Student, Polytechnique de Montréal
2023/1 - 2027/12 Co-Supervisor	Sneha Paul (In Progress) , Concordia University Student Degree Expected Date: 2027/12 Thesis/Project Title: AI in computer vision for passenger counting at bus stops Present Position: PhD Student, Mitacs Intern (BusPas, Inc.), Concordia Institute for Information Systems Engineering
2021/9 - 2025/9 Co-Supervisor	Siavash Farazmand (In Progress) , Concordia University Student Degree Expected Date: 2025/9 Thesis/Project Title: Artificial intelligence-based user profiling in transportation planning Present Position: PhD Student, Mitacs Intern (BusPas, Inc.), Concordia University
2021/9 - 2021/12 Principal Supervisor	Saeed Rahmani (In Progress) , Concordia University Thesis/Project Title: Network-based deep-learning approaches in transportation planning Present Position: PhD Student, Delft Technical University, Concordia University
2021/2 - 2022/5 Co-Supervisor	Amirnia, Ashkan (Withdrawn) , Concordia University Thesis/Project Title: Recommender systems for transit itinerary diversion Present Position: Unknown, Concordia University - CIISE
2021/1 - 2025/6 Co-Supervisor	Baghbani, Asiye (In Progress) , Concordia University Student Degree Expected Date: 2025/6 Thesis/Project Title: Graph Neural Networks for Transit Load Factor Forecasting Present Position: PhD Student, Mitacs Intern (BusPas, Inc.), Concordia University - CIISE
2020/9 - 2025/12 Co-Supervisor	Hamed Naseri (In Progress) , Polytechnique Montréal Student Degree Expected Date: 2023/9 Thesis/Project Title: Machine learning methods for estimating transit passenger diversion Present Position: PhD Student, Polytechnique Montréal - Civil Engineering
2019/9 - 2024/12 Co-Supervisor	Roudbari, Naghmeh Shafiee (In Progress) , Concordia University Thesis/Project Title: Automated Data Acquisition Methods for Transportation and Land-use Modeling Present Position: PhD Student, Concordia University - Computer Science
2017/1 - 2021/4 Co-Supervisor	Badu-Marfo, Godwin (Completed) , Concordia University Thesis/Project Title: Methods to ensure server-side confidentiality and security with Big Transport Data Present Position: Senior ML Engineer, Qube Tech, Ryerson University - Civil Engineering
2016/9 - 2020/5 Co-Supervisor	Yazdizadeh, Ali (Completed) , Concordia University Thesis/Project Title: The Application of Artificial Intelligence for Analyzing Traveler Mobility and Activity Patterns with Smartphone Data Present Position: Senior Data Scientist, Metrolinx, Metrolinx
Post-doctorate [n=8]	
2023/7 - 2025/6 Co-Supervisor	Xiaoyu Zhang (In Progress) , Polytechnique de Montréal Student Degree Expected Date: 2025/6 Thesis/Project Title: A Framework for On-demand Transit Simulation Present Position: Postdoctoral Researcher, Polytechnique de Montréal

2023/1 - 2023/12 Co-Supervisor	Mehdi Meshkani (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Recommender systems for on-demand transit dispatching Present Position: Postdoctoral Researcher, Mitacs Intern (BusPas, Inc.), Concordia Institute for Information Systems Engineering
2022/10 - 2023/2 Co-Supervisor	Fereshteh Samadi (Completed) , Concordia University Thesis/Project Title: AI for transit passenger count forecasting Present Position: Postdoctoral Fellow (Ecole de technologie superieure), École de technologie supérieure
2021/1 - 2021/7 Co-Supervisor	Ihou, Eddy (Completed) , Concordia University Thesis/Project Title: User Profiling for transit demand management. Present Position: Data scientist, Zetane Systems Inc., Concordia University - CIISE
2021/1 - 2022/9 Co-Supervisor	Pan Long (Completed) , Polytechnique Montréal Thesis/Project Title: Discrete Choice Experiments for Transit Diversion. Present Position: Assistant Professor, Beijing Jiaotong University, Polytechnique Montréal - Civil Engineering
2020/9 - 2021/10 Co-Supervisor	Muhammad Azam (Completed) , Concordia University Thesis/Project Title: AI for Transit Load Factor Forecasting. Present Position: Artificial Intelligence Lead, Axem Neurotechnology, Concordia University - CIISE
2018/1 - 2021/12 Co-Supervisor	Bobin Wang (Completed) , Polytechnique Montréal Thesis/Project Title: Discrete Choice Experiments for Transit User Diversion Present Position: Assistant Professor, Université Laval, Polytechnique Montréal - Civil Engineering
2017/8 - 2018/6 Co-Supervisor	Fallah-Shorhani, Masoud (Completed) , McGill University Thesis/Project Title: Calculating daily pollution emissions exposure with smartphone data Present Position: Senior Research Associate, University of Southern California, University of Southern California

Research Associate [n=4]

2019/5 - 2020/8 Principal Supervisor	Dillan Cools (Completed) , Concordia University Thesis/Project Title: Google Location History and Activity Space Stabilization. Present Position: Master's of Urban Planning Student (McGill University), Concordia University - Department of Geography
2017/2 - 2017/7 Principal Supervisor	Stephane Lavoie (Completed) , Concordia University Thesis/Project Title: Design of Documentation for Itinerum Platform. Present Position: Freelance documentary filmmaker, writer and designer, University of British Columbia
2017/2 - 2017/7 Principal Supervisor	Hannah Materne (Completed) , Concordia University Thesis/Project Title: Design of Documentation for Itinerum Platform. Present Position: Freelance Graphic Designer, Self-employed
2015/11 - 2022/5 Principal Supervisor	Kyle Fitzsimmons, Concordia University Thesis/Project Title: Research development Present Position: Research Frontend and Smart Contracts Developer, DFX Finance, Concordia University

Event Administration

2020/6 - 2020/6	Organizer, The Economy of Cities: Urban planning and transportation, Seminar, 2020/6 - 2020/6
2020/1 - 2020/1	Co-organizer, Travel Behaviour and Safety Studies from the Psychological / Neurophysiological Perspective: Application of Virtual Reality, Workshop, 2020/1 - 2020/1
2019/1 - 2019/1	Co-organizer, Hands-on Workshop for VR in Stated Response Research, Workshop, 2019/1 - 2019/1
2019/1 - 2019/1	Organizer, Beyond Disciplines: Cities, Workshop, 2019/1 - 2019/1
2018/1 - 2018/1	Co-organizer, Workshop on Virtual and Augmented Reality for Travel Behavior Analysis, Workshop, 2018/1 - 2018/1
2015/3 - 2017/1	Organizer, TRB Workshop on the Use of Visualization in Stated Preference Surveys, Workshop, 2017/1 - 2017/1

Editorial Activities

2018/1 - 2024/1	Reviewer, Transportation, Journal
2023/1 - 2023/12	Reviewer, Transportation Planning and Technology, Journal
2023/1 - 2023/12	Reviewer, Travel Behaviour and Society, Journal
2021/1 - 2023/12	Reviewer, IEEE Intelligent Transportation Systems Transactions, Journal
2015/1 - 2023/12	Reviewer, Transportation Research: Part A, Journal
2010/9 - 2023/6	Reviewer, Transportation Research Record, Journal
2022/1 - 2022/12	Reviewer, Geospatial Information Science, Journal
2022/1 - 2022/12	Reviewer, Journal of Advanced Transportation, Journal
2022/1 - 2022/12	Reviewer, Journal of Environmental Economics and Policy, Journal
2022/1 - 2022/12	Reviewer, Environment and Planning B: Planning and Design, Journal
2020/1 - 2022/12	Reviewer, Journal of Planning Education Research, Journal
2021/8 - 2021/12	Reviewer, Transportation Research Part C: Emerging Technologies, Journal
2019/1 - 2021/12	Reviewer, Urban Studies, Journal
2020/1 - 2020/12	Reviewer, Computers Environment and Urban Systems, Journal
2017/1 - 2020/12	Reviewer, Journal of Geographical Systems, Journal
2019/1 - 2019/12	Reviewer, Journal of Environmental Economics and Management, Journal
2019/1 - 2019/12	Reviewer, Landscape and Urban Planning, Journal
2018/1 - 2018/12	Reviewer, PlosOne, Journal
2018/1 - 2018/12	Reviewer, Sensors, Journal
2017/1 - 2017/12	Reviewer, International Journal of GIS, Journal

Knowledge and Technology Translation

2021/5 - 2023/6 Principal Investigator, R&D Collaboration with Industry
 Group/Organization/Business Serviced: Transports Québec
 Target Stakeholder: Government Personnel
 Outcome / Deliverable: Development of multimodal accessibility transportation indicators for transportation planning purposes.
 Evidence of Uptake/Impact: Report and knowledge transfer presentation to wide group of representatives of Transports Québec.

International Collaboration Activities

2021/1 - 2021/12 Research Collaborator, United States of America
 Development of research needs statements with professors at Central Florida University, University of Virginia and University of Tennessee

2016/1 - 2018/1 Research Collaborator, United States of America
 With Ricardo Daziano (and Owen Waygood of Laval), work on representational mode in Discrete Choice Experiments on respondent willingness to pay estimates for GHG reductions

2016/5 - 2017/2 Research Collaborator, United States of America
 PI of grant application submitted to the Transatlantic Partnership "Digging into Data Challenge" with Catherine Lawson (and others) of University at Albany

2016/5 - 2017/2 Research Collaborator, United Kingdom
 PI of grant application submitted to the Transatlantic Partnership "Digging into Data Challenge" with Aruna Sivakumar (and others) of Imperial College London

Committee Memberships

2022/4 - 2026/3 Chair, TRB Standing Committee on Travel Survey Methods (AEP25), Transportation Research Board of the United States

2020/4 - 2024/4 Committee Member, Transportation Research Board Urban Data Committee (AED20), US Transportation Research Board

2021/6 - 2023/12 Co-chair, Big Urban Data subcommittee AED20(2), US Transportation Research Board

2018/1 - 2023/12 Co-chair, Stated Response Subcommittee of Travel Survey Methods Committee, US Transportation Research Board

2016/6 - 2023/4 Committee Member, TRB Standing Committee on Travel Survey Methods (ABJ40), Transportation Research Board

2014/1 - 2019/5 Committee Member, Scientific Committee of the Chaire Mobilité, École Polytechnique de Montréal

Other Memberships

2010/5 Regular Member, Centre interuniversitaire de recherche sur les réseaux d'entreprise, la logistique et le transport

Presentations

1. Zachary Patterson, Mehdi Meshkani, Siavash Farazmand & Zachary Patterson. (2024). Innovative On-Demand Transit for First-Mile Trips: A Cutting-Edge Approach. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
2. (2024). Revolutionary Instrument or Another Tool in the Toolbox?. Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
3. Long Pan, EOD Waygood, and Zachary Patterson. (2023). Public Transit Itinerary Choice Analysis Considering Various Incentives. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
4. Hamed Naseri, Owen Waygood, Zachary Patterson & Bobin Wang. (2023). Who Is More Likely to Buy Electric Vehicles?. World Conference on Transportation Research, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No
5. Hamed Naseri, EOD Waygood, Bobin Wang and Zachary Patterson. (2023). An Interpretable Machine Learning Approach to Predict Who Will Buy Electric Vehicles. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
6. Hamed Naseri, Owen Waygood, Zachary Patterson, Meredith Alousi-Jones, Bobin Wang. (2023). Travel Mode Choice Prediction: Developing New Techniques to Prioritize Variables and Interpret Black-box Machine Learning Techniques. World Conference on Transportation Research, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No
7. (2023). Développement d'indicateurs d'accessibilité pour la production d'analyses multimodales et non comparatives - Projet R860.1. Activité de transfert de connaissance, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
8. Ashkan Amirnia, Long Pan, EOD Waygood, Zachary Patterson and Nizar Bouguila. (2023). Personalized Bus Recommender System Approach For Flattening Demand. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
9. Mohamed Chaaben, Asiye Baghbani, Nizar Bouguila and Zachary Patterson. (2023). Short-Term Bus Passenger Flow Prediction Using Multi-Component Graph Attention Neural Network Model. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
10. Zachary Patterson, E.O.D. Waygood and Long Pan. (2023). How Bus Crowding Information Affects Bus Transit User Itinerary Choice. World Conference on Transport Research, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No

11. Hamed Naseri, Owen Waygood, Zachary Patterson, Meredith Alousi-Jones & Bobin Wang. (2023). Travel Mode Choice Prediction: Developing New Techniques to Prioritize Variables and Interpret Black-box Machine Learning Techniques. World Conference on Transport Research, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No
12. Asiye Baghbani, Saeed Rahmani, Nizar Bouguila and Zachary Patterson. (2023). Multi-step Short-term Passenger Flow Prediction In Bus Networks Using Graph-based Deep Learning Model. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
13. Hamed Naseri, EOD Waygood, Bobin Wang and Zachary Patterson. (2023). Application of Machine Learning to Child Mode Choice with a Novel Technique to Optimize Hyperparameters. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
14. Zachary Patterson and Ben Azoulay. (2023). Towards Standardization of Reporting in Smartphone Travel Surveys. The 12th International Conference on Transport Survey Methods, Porto Novo, Portugal
Main Audience: Researcher
Invited?: No, Keynote?: No
15. Zachary Patterson, Bobin Wang, E.O.D. Waygood, Ricardo Daziano, Marketta Braun Kohlova. (2022). Consistency Analysis of Survey Data. The 12th International Conference on Transport Survey Methods, Porto Novo, Portugal
Main Audience: Researcher
Invited?: No, Keynote?: No
16. Long Pan, E.O.D Waygood and Zachary Patterson. (2022). Public transit itinerary choice analysis considering various incentives. Conference of the International Association of Travel Behaviour Research, Santiago, Chile
Main Audience: Researcher
Invited?: No, Keynote?: No
17. Hamed Naseri, E.O.D Waygood, Bobin Wang and Zachary Patterson. (2022). An Interpretable Machine Learning Approach to Predict Who Will Buy Electric Vehicles. Conference of the International Association of Travel Behaviour Research, Santiago, Chile
Main Audience: Researcher
Invited?: No, Keynote?: No
18. (2021). Smart Cities - A solution for infrastructure longevity?. MTL Connect, Online, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No
19. (2020). Une appli peut-elle sauver les villes ?. MTL Connecte (Le Monde), Montreal, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No
20. (2020). The Walrus Leadership Roundtable: Building the Next-Generation City. The Walrus Leadership Roundtable, Online, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
21. (2019). Applications smartphone pour le recueil de données de mobilité. Journées d'études sur la mobilité urbaine, Paris, France
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No

Broadcast Interviews

2017/10/03 - 2017/10/03	MTL Trajet, Global News Morning, Global Television
2016/02/05 - 2016/09/01	Mapping Bus Routes with Smartphones in Africa, RadioCanada International, RadioCanada International
2014/10/24 - 2015/10/24	Seniors and Suburbanization, Radio Canada International (French), Radio Canada International (French)
2014/10/14 - 2015/10/14	Suburbanization of Seniors, Radio Canada International (English), Radio Canada International
2014/11/01 - 2014/11/01	Suburbanization of Seniors, Des aînés et des droits, CIBL (Montreal), CHOQ-FM (Toronto)
2014/10/17 - 2014/10/17	Suburbanization of Seniors, The Aaron Rand Show, CJAD (Montreal)
2014/10/15 - 2014/10/15	Suburbanization of Seniors, CBC Montreal - Radio Noon, CBC Radio

Publications

Journal Articles

1. Long Pan, EOD Waygood & Zachary Patterson. (2024). How Bus Crowding Information Affects Bus Transit User Itinerary Choice. *Cast Studies on Transport Policy*.
Accepted
Refereed?: Yes, Open Access?: No
2. Mehdi Meshkani, Siavash Farazmand, Nizar Bouguila & Zachary Patterson. (2024). Innovative On-Demand Transit for First-Mile Trips: A Cutting-Edge Approach. *Transportation Research Record*.
Accepted
Refereed?: Yes, Open Access?: No
3. Hamed Naseri, Owen Waygood, Zachary Patterson & Bobin Wang. (2024). Who Is More Likely to Buy Electric Vehicles?. *Transport Policy*.
Submitted
Refereed?: Yes, Open Access?: No
4. Hamed Naseri, Owen Waygood, Zachary Patterson, Meredith Alousi-Jones & Bobin Wang. (2024). Travel Mode Choice Prediction: Developing New Techniques to Prioritize Variables and Interpret Black-box Machine Learning Techniques. *Transportation Planning and Technology*.
Submitted
Refereed?: Yes, Open Access?: No
5. Sneha Paul, Zachary Patterson & Nizar Bouguila. (2024). FishSegSSL: A Semi-supervised Semantic Segmentation Framework for Fish-eye Images. *Journal of Imaging*.
Submitted
Refereed?: Yes, Open Access?: Yes
6. Bobin Wang, E.O.D. Xun Ji, Hamed Naseri, Alex L. Loisselle, Ricardo A. Daziano, Zachary Patterson, and Matthew Feinberg. (2023). How to Effectively Communicate about Greenhouse Gas Emissions with Different Populations. *Environmental Science & Policy*. 147(September): 29-43.
Published
Refereed?: Yes

7. Sneha Paul, Zachary Patterson & Nizar Bouguila. (2023). DualMLP: A Two-stream Fusion Model for 3D Point Cloud Classification. The Visual Computer Journal: <https://doi.org/10.1007/s00371-023-03114-3>.
Published
Refereed?: Yes, Open Access?: No
8. Hamed Naseri,* EOD Waygood, Bobin Wang and Zachary Patterson. (2023). An Interpretable Machine Learning Approach to Predict Who Will Buy Electric Vehicles. Transportation Research Record.
Published
Refereed?: Yes
9. Saeed Rahmani, Nizar Bouguila and Zachary Patterson. (2023). Graph Neural Networks for Intelligent Transportation Systems: A Survey. IEEE Transactions for Intelligent Transportation Systems.
Published
Refereed?: Yes
10. Long Pan, EOD Waygood, and Zachary Patterson. (2023). Public Transit Itinerary Choice Analysis Considering Various Incentives. Transportation Research Record. 2677(11)
Published
Refereed?: Yes
11. Zachary Patterson, Aaron Bensmihen, Gavin Hermanson. (2023). The Multimodal Accessibility Target. Transportation Research Record. 2678(1)
Published
Refereed?: Yes, Open Access?: Yes
12. Bobin Wang, Xun Ji, E.O.D. Waygood, Hamed Naseri, Alex Latulipe Loiselle, Zachary Patterson, Matthew Feinberg. (2023). Exploring the Effects of New Framing Techniques for Greenhouse Gas Emissions. Journal of Cleaner Production.
Revision Requested
Refereed?: Yes
13. Hamed Naseri, EOD Waygood, Bobin Wang and Zachary Patterson. (2022). Application of Machine Learning to Child Mode Choice with a Novel Technique to Optimize Hyperparameters. International Journal of Environmental Research and Public Health. 19(4)
Published
Refereed?: Yes
14. Pierre Laffont; E.O.D. Waygood; Zachary Patterson. (2022). How Many EVs Are Needed To Reach CO2 Emissions Goals? A Case Study from Montreal, Canada. Sustainability. 14(3)
Published
Refereed?: Yes
15. Godwin Badu-Marfo, Bilal Farooq and Zachary Patterson. (2022). Composite Travel Generative Adversarial Networks for Tabular and Sequential Population Synthesis. IEEE Transactions on Intelligent Transportation Systems. 23(10)
Published
Refereed?: Yes
16. Ali Baghdadi, Narges Manouchehri, Zachary Patterson, Wentao Fan, and Nizar Bouguila. (2022). Hierarchical Dirichlet and Pitman-Yor process mixtures of shifted scaled dirichlet distributions for proportional data modelling. Computational Intelligence. 38: 2095-2115.
Published
Refereed?: Yes
17. Asiye Baghbani, Nizar Bouguila, Zachary Patterson. (2022). Short-Term Passenger Flow Prediction Using a Bus Network Graph Convolutional LSTM Neural Network Model. Transportation Research Record. 2677(2)
Published
Refereed?: Yes, Open Access?: No

18. Bochu Liu, Michael J. Widener, Lindsey G. Smith, Steven Farber, Dionne Gesink, Leia M. Minaker, Zachary Patterson, Kristian Larsen, and Jason Gilliland. (2022). Time-Geographic Project of Household Food Provision: Conceptualization and a Pilot Case Study. *Annals of the American Association of Geographers*.
Published
Refereed?: Yes
19. Hamed Naseri; E.O.D. Waygood; Bobin Wang; Zachary Patterson; Ricardo Daziano. (2022). A Novel Feature Selection Technique to Better Predict Climate Change Stage of Change. *Sustainability*. 14(40)
Published
Refereed?: Yes
20. Godwin Badu-Marfo, Bilal Farooq, Zachary Patterson. (2022). Differentially Private Multi-Output Deep Generative Networks for Population Mobility Data Synthesis. *Transportation Research Part A: Policy and Practice*.
Revision Requested
Refereed?: Yes, Open Access?: No
21. Bochu Liu, Michael J. Widener, Lindsey G. Smith, Steven Farber, Dionne Gesink, Leia M. Minaker, Zachary Patterson, Kristian Larsen, and Jason Gilliland. (2022). Who's cooking tonight? a time-use study of coupled adults in Toronto, Canada. *Time & Society*. 33(4): 480--507.
Published
Refereed?: Yes, Open Access?: Yes
22. Long Pan, E.O.D. Waygood, Zachary Patterson. (2022). Would You Wait? Bus Choice Behavior Analysis Considering Various Incentives. *Transportation Research Record*. 2676(7)
Published
Refereed?: Yes, Open Access?: No
23. Dillan Cools, Scott Christian McCallum, Daniel Rainham, Nathan Taylor, and Zachary Patterson. (2021). Understanding Google Location History as a tool for travel diary data acquisition. *Transportation Research Record*. 2675(1)
Published
Refereed?: Yes, Open Access?: No
24. Bochu Liu, Michael J. Widener, Lindsey G. Smith, Steven Farber, Leia M. Minaker, Zachary Patterson, Kristian Larsen, Jason Gilliland. (2021). Disentangling Time Use, Food Environment, and Food Behaviors Using Multi-Channel Sequence Analysis. *Geographical Analysis*. 54(4): 881-917.
Published
Refereed?: Yes, Open Access?: Yes
25. Ali Yazdizadeh, Zachary Patterson & Bilal Farooq. (2021). Semi-supervised GANs to Infer Travel Modes in GPS Trajectories. *Journal of Big Data Analytics in Transportation*. (July)
Published
Refereed?: Yes, Open Access?: No
26. Ravi Teja Vemuri, Muhammad Azam, Nizar Bouguila & Zachary Patterson. (2021). A Bayesian sampling framework for asymmetric generalized Gaussian mixture models learning. *Neural Computing and Applications*.
Published
Refereed?: Yes, Open Access?: No
27. E. O. D. Waygood, Bobin Wang, Ricardo A. Daziano, Zachary Patterson & Markéta Braun Kohlová. (2021). The climate change stage of change measure: vehicle choice experiment. *Journal of Environmental Planning and Management*.
Published
Refereed?: Yes, Open Access?: Yes

28. Ali Yazdizadeh, Arash Kalatian, Zachary Patterson, Bilal Farooq. (2021). Multi-task Recurrent Neural Networks to Simultaneously Infer Mode and Purpose in GPS Trajectories. Transportation. Submitted
Refereed?: Yes, Open Access?: No
29. BobinWang, E.O.D.Waygood, Ricardo A. Daziano, Zachary Patterson, Matthew Feinberg. (2021). Does Hedonic Framing Improve People's Willingness-To-Pay for Vehicle Greenhouse Gas Emissions?. Transportation Research Part D. 98(September)
Published
Refereed?: Yes, Open Access?: Yes
30. Lindsey G Smith, Michael J Widener, Bochu Liu, Steven Farber, Leia Minaker, Zachary Patterson, Kristian Larsen and Jason Gilliland. (2021). Comparing household and individual measures of access through a food environment lens: what household food opportunities are missed when measuring access to food retail at the individual level. Annals of the American Association of Geographers.
Published
Refereed?: Yes, Open Access?: No
31. Ben Azoulay, Zachary Patterson. (2021). Towards the Standardization of Reporting in Smartphone Travel Surveys: The Development and Application of the Smartphone Survey Reporting Guidelines (SSRGs). Transportation Research Procedia from the 12th International Conference on Transport Survey Methods.
Accepted
Refereed?: Yes, Open Access?: No
32. R.Daziano, E.O.D.Waygood, Z.Patterson, M.Feinberg, B.Wang. (2020). Reframing greenhouse gas emissions information presentation on the Environmental Protection Agency's new-vehicle labels to increase willingness to pay. Journal of Cleaner Production. 279(10 January)
Published
Refereed?: Yes, Open Access?: No
33. Ali Yazdizadeh, Zachary Patterson & Bilal Farooq. (2020). Ensemble Convolutional Neural Networks for Mode Inference in Smartphone Travel Survey. IEEE Transactions on Intelligent Transportation Systems. 21(6)
Published
Refereed?: Yes, Open Access?: No
34. Godwin Badu-Marfo, Bilal Farooq & Zachary Patterson. (2019). Perturbation Methods for Protection of Sensitive Location Data: Smartphone Travel Survey Case Study. Transportation Research Record. 2673(12)
Published
Refereed?: Yes, Open Access?: No
35. Ali Yazdizadeh, Zachary Patterson, Bilal Farooq. (2019). An automated approach from GPS traces to complete trip information. International Journal of Transportation Science and Technology. 8(1): 82-100.
Published
Refereed?: Yes, Open Access?: Yes
36. Zachary Patterson, Kyle Fitzsimmons, Stewart Jackson, Takeshi Mukai. (2019). Itinerum: The open smartphone travel survey platform. SoftwareX. 10(Jul-Dec)
Published
Refereed?: Yes, Open Access?: Yes
37. Godwin Badu-Marfo, Bilal Farooq, Zachary Patterson. (2019). A Perspective on the Challenges and Opportunities for Privacy-Aware Big Transportation Data. Journal of Big Data Analytics in Transportation. (1): 1-23.
Published
Refereed?: Yes, Open Access?: No

38. Masoud Fallah-Shorshani, Marianne Hatzopoulou, Nancy A. Ross, Zachary Patterson, Scott Weichenthal. (2018). Evaluating the Impact of Neighborhood Characteristics on Differences between Residential and Mobility-Based Exposures to Outdoor Air Pollution. *Environmental Science & Technology*. 52(18): 10777–10786.
Published
Refereed?: Yes, Open Access?: No
39. Ali Rezaei and Zachary Patterson. (2018). Preference Stability in Household Location Choice: Accounting for the Evolution of Choice Behavior in Montreal across Three Censuses. *Research in Transportation Economics*. 67(May): 44-53.
Published
Refereed?: Yes, Open Access?: No
40. Michael J Widener, Leia M Minaker, Jessica L Reid, Zachary Patterson, Tara Kamal Ahmadi, David Hammond. (2018). Activity space-based measures of the food environment and their relationships to food purchasing behaviours for young urban adults in Canada. *Public Health Nutrition*. 21(11)
Published
Refereed?: Yes, Open Access?: Yes

Book Chapters

1. Ravi Vemuri, Narges Manouchehri, Zachary Patterson, and Nizar Bouguila. (2021). Bayesian Inference of Hidden Markov Models using Dirichlet Mixtures. Nizar Bouguila, W. Fan, and M. Amayri. *Hidden Markov Models and Applications*. : 157–176.
Published, Springer
Refereed?: Yes
2. Ali Baghdadi, Narges Manouchehri, Zachary Patterson and Nizar Bouguila. (2021). Shifted-Scaled-Dirichlet Based Hierarchical Dirichlet Process Hidden Markov Models with Variational Inference Learning. Nizar Bouguila; W. Fan; M. Amayri. *Hidden Markov Models and Applications*. : 263–292.
Published, Springer
Refereed?: Yes

Reports

1. Gavin Hermanson, Pierre Laffont and Zachary Patterson. (2023). Rapport final : Développement d'indicateurs d'accessibilité pour la production d'analyses multimodales et non comparatives R860.1. 77. Transports Québec.
2. Gavin Hermanson, Pierre Laffont, Zachary Patterson. (2021). Rapport d'étape : Développement d'indicateurs d'accessibilité pour la production d'analyses multimodales et non comparatives R860.1. 26. Transports Quebec.
3. Bobin Wang, Owen Waygood, Zachary Patterson. (2021). Micro Transit Demand Management (microTDM) with Big Data and Artificial Intelligence. 23. BusPas Inc.

Conference Publications

1. Sneha Paul, Zachary Patterson & Nizar Bouguila. (2024). Semi-supervised Semantic Segmentation on Vehicle-Mounted Fish-eye Camera Images. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2024/1
Poster
Published
Refereed?: Yes, Invited?: No

2. Asiye Baghbani, Saeed Rahmani, Nizar Bouguila and Zachary Patterson. (2023). Predicting Passenger Flow Using Graph Neural Networks with Scheduled Sampling on Bus Networks. 2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC), Bilbao, Spain
Conference Date: 2023/9
Paper
Accepted
Refereed?: Yes, Invited?: No
3. Mohamed Chaaben, Asiye Baghbani, Nizar Bouguila and Zachary Patterson. (2023). Multi-STGAC: A Graph Attention Based Model for Short-term Bus Passenger Flow Forecasting. 2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC), Bilbao, Spain
Conference Date: 2023/9
Paper
Accepted
Refereed?: Yes, Invited?: No
4. Long Pan, E.O.D. Waygood, Zachary Patterson. (2023). How Bus Crowding Information Affects Bus Transit User Itinerary Choice. World Conference on Travel Research, Montreal, Canada
Conference Date: 2023/7
Paper
Accepted
Refereed?: Yes, Invited?: No
5. Naghmeh Shafiee Roudbari, Zachary Patterson, Ursula Eicker and Charalambos Poullis. (2022). Simpler is better: Multilevel Abstraction with Graph Convolutional Recurrent Neural Network Cells for Traffic Prediction. IEEE SSCI 2022 proceedings. IEEE Symposium Series On Computational Intelligence (ICIT22), Singapore, Singapore
Conference Date: 2022/12
Paper
Published
Refereed?: Yes, Invited?: No
6. Ravi Teja Vemuri, Muhammad Azam, Nizar Bouguila and Zachary Patterson. (2022). Bayesian Model and Feature Selection in Asymmetric Generalized Gaussian Mixtures. 2022 IEEE International Conference on Industrial Technology (ICIT), Shanghai (fully online), China
Conference Date: 2022/8
Paper
Published
Refereed?: Yes, Invited?: No
7. Sneha Paul, Zachary Patterson and Nizar Bouguila. (2022). Improved Training for 3D Point Cloud Classification. Structural, Syntactic, and Statistical Pattern Recognition. S+SSPR 2022 - IAPR Joint International Workshops on Statistical Techniques in Pattern Recognition (SPR 2022) and Structural and Syntactic Pattern Recognition (SSPR 2022), Montreal, Canada
Conference Date: 2022/8
Paper
Published
Refereed?: Yes, Invited?: No
8. Gavin Hermanson, Zachary Patterson. (2022). Multimodal Accessibility to Employment and Equity: A Case Study of the Pie-IX Bus Rapid Transit in Montreal, Canada. Proceedings of the 101st Annual Meeting of the Transportation Research Board. 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Accepted
Refereed?: Yes, Invited?: No

9. Hamed Naseri, Owen Waygood, Bogin Wang, Zachary Patterson. (2022). How to predict Climate Change Stage of Change Accurately: Proposing A New Feature Selection Technique. Proceedings of the 101st Annual Meeting of the Transportation Research Board. Proceedings of the 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Accepted
Refereed?: Yes, Invited?: No
10. Bobin Wang, Xun Ji, E.O.D. Waygood, Hamed Naseri, Alex Latulipe Loiselle, Zachary Patterson, Matthew Feinberg. (2022). Exploring the Effects of New Framing Techniques for Greenhouse Gas Emissions. Proceedings of the 101st Annual Meeting of the Transportation Research Board. Proceedings of the 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Published
Refereed?: Yes, Invited?: No
11. Aaron Bensmihen, Zachary Patterson. (2022). The Multimodal Accessibility Indicator (MAI) across the United States. Proceedings of the 101st Annual Meeting of the Transportation Research Board. 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Accepted
Refereed?: Yes, Invited?: No
12. Asiye Baghbani, Nizar Bouguila, Zachary Patterson. (2022). Short-Term Passenger Flow Prediction Using a Bus Network Graph Convolutional LSTM Neural Network Model. Proceedings of the 101st Annual Meeting of the Transportation Research Board. 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Accepted
Refereed?: Yes, Invited?: No
13. Long Pan, E.O.D. Waygood, Zachary Patterson. (2022). Would You Wait? Bus Choice Behavior Analysis Considering Various Incentives. 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Accepted
Refereed?: Yes, Invited?: No
14. Zachary Patterson, Aaron Bensmihen, Gavin Hermanson. (2021). The Multimodal Accessibility Target (MAT). Proceedings of the 2021 World Symposium on Transportation and Land Use Research. 2021 World Symposium on Transportation and Land Use Research, Washington, United States of America
Conference Date: 2021/8
Paper
Published
Refereed?: Yes, Invited?: No

15. Godwin Badu-Marfo, Bilal Farooq, Zachary Patterson. (2021). Privacy versus Accuracy in Activity Diary Synthesis: A Differentially Private Multi-Output Deep Generative Networks Approach. Proceedings of the 100th Annual Meeting of the Transportation Research Board. 100th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2021/1
Paper
Published
Refereed?: Yes, Invited?: No
16. Zachary Patterson, Aaron Bensmihen, Gavin Hermanson. (2021). The Multimodal Accessibility Benchmark (MAB) in Transportation Planning. Proceedings of the 100th Annual Meeting of the Transportation Research Board. 100th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2021/1
Paper
Published
Refereed?: Yes, Invited?: No
17. Ben Azoulay, Zachary Patterson. (2021). Towards the Standardization of Reporting in Smartphone Travel Surveys: The Smartphone Survey Reporting Guidelines (SSRG). Proceedings of the 100th Annual Meeting of the Transportation Research Board. 100th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2021/1
Paper
Published
Refereed?: Yes, Invited?: No
18. Bobin Wang, Owen Waygood, Ricardo Daziano, Zachary Patterson. (2021). Willingness-To-Pay for Transport Emissions by Region and Climate Change-Stage of Change: A Vehicle Choice Experiment with Framing. Proceedings of the 100th Annual Meeting of the Transportation Research Board. 100th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2021/1
Paper
Published
Refereed?: Yes, Invited?: No
19. Scott McCallum, Zachary Patterson. (2021). Google Location History Data and its Potential for Activity Space Research. Proceedings of the 100th Annual Meeting of the Transportation Research Board. 100th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2021/1
Paper
Published
Refereed?: Yes, Invited?: No
20. Ricardo Daziano, E. Owen Waygood, Zachary Patterson, Matthew Feinberg, Bobin Wang. (2020). Framing greenhouse gas emissions on the environmental protection agency's new vehicle labels to increase willingness to pay. Proceedings of the 99th Annual Meeting of the Transportation Research Board. 99th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2020/1
Paper
Published
Refereed?: Yes, Invited?: No

21. Dillan Cools, Scott McCallum, Daniel Rainham, Nathan Taylor, Zachary Patterson. (2020). Understanding Google Location History as a tool for travel diary data acquisition. Proceedings of the 99th Annual Meeting of the Transportation Research Board. 99th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2020/1
Paper
Published
Refereed?: Yes, Invited?: No
22. David Lopez, Ali Yazdizadeh, Bilal Farooq, Zachary Patterson. (2020). A distributed framework for privacy aware mode interference. Proceedings of the 99th Annual Meeting of the Transportation Research Board. 99th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2020/1
Paper
Published
Refereed?: Yes, Invited?: No
23. Ben Azoulay, Barrett Hedges, and Zachary Patterson. (2020). Toward a quantitative methodology for evaluating the distribution of space in complete streets. Proceedings of the 99th Annual Meeting of the Transportation Research Board. 99th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2020/1
Paper
Published
Refereed?: Yes, Invited?: No
24. E. Owen Waygood, Bobin Wang, Ricardo Daziano, Zachary Patterson, Marketa Braun Kohlova. (2020). Vehicle choice and CO2 emissions information: Framing effects and individual climate change stage of change. Proceedings of the 99th Annual Meeting of the Transportation Research Board. 99th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2020/1
Paper
Published
Refereed?: Yes, Invited?: No
25. Owen Waygood, Ricardo Daziano, Matthew Feinberg, Zachary Patterson, Bobin Wang. (2019). How will Information Framing Influence Individual's Willingness-to-Pay for CO2 Emissions Reductions. Proceedings of the 6th International Choice Modelling Conference. 6th International Choice Modelling Conference, Kobe, Japan
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
26. Godwin Badu-Marfo, Bilal Farooq, Zachary Patterson. (2019). Privacy preserved generative learning approach for open behavioural data. Proceedings of the 6th International Choice Modelling Conference. 6th International Choice Modelling Conference, Kobe, Japan
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No

27. Marshall Davey, Ali Yazdizadeh, and Zachary Patterson. (2019). Transit network complexity in the context of transit itinerary inference using smartphone travel survey data. Proceedings of the 98th Annual Meeting of the Transportation Research Board. 98th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2019/1
Paper
Published
Refereed?: Yes, Invited?: No
28. Parham Hamouni, Ciprian Alecsandru, Zachary Patterson. (2019). A methodology to incorporate scenicness into revealed preference pedestrian route choice modeling from smartphone data. Proceedings of the 98th Annual Meeting of the Transportation Research Board. 98th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2019/1
Paper
Published
Refereed?: Yes, Invited?: No
29. Godwin Badu-Marfo, Bilal Farooq, Zachary Patterson. (2019). Perturbation privacy for sensitive locations in mobility data publication: A case study of Montreal Trajet surveys. Proceedings of the 98th Annual Meeting of the Transportation Research Board. 98th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2019/1
Paper
Published
Refereed?: Yes, Invited?: No
30. Michael Widener, Leia Minaker, Tara Kamal Ahmadi, Zachary Patterson, Jessica Reid, David Hammond. (2018). Activity space-based measures of the food environment and their relationships to food purchasing behaviors for young urban adults in Canada. Proceedings of the 97th Annual Meeting of the Transportation Research Board. 97th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2018/1
Paper
Published
Refereed?: Yes, Invited?: No
31. Godwin Badu-Marfo, Zachary Patterson, Bilal Farooq. (2018). Challenges and opportunities for privacy aware big transport data: Short-term and long-term outlook. Proceedings of the 97th Annual Meeting of the Transportation Research Board. 97th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2018/1
Paper
Published
Refereed?: Yes, Invited?: No
32. Michael Widener, Leia Minaker, Tara Kamal Ahmadi, Zachary Patterson, Jessica Reid, David Hammond. (2018). Recruitment, burden, incentives and participation in smartphone travel surveys. Proceedings of the 97th Annual Meeting of the Transportation Research Board. 97th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2018/1
Paper
Published
Refereed?: Yes, Invited?: No

33. Mohsen Rezaei, Zachary Patterson, Jia-Yuan Yu, Ali Yazdizadeh. (2018). Semi-supervised learning for mode detection from smartphone data. Proceedings of the 97th Annual Meeting of the Transportation Research Board. 97th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2018/1
Paper
Published
Refereed?: Yes, Invited?: No



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Dr. Andrea Schiffauerova

Correspondence language: English

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Dr. Andrea Schiffauerova

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
Czech	Yes	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes
German	Yes	No	No	No	No
Russian	Yes	Yes	No	Yes	No
Spanish; Castilian	Yes	Yes	No	Yes	No

Degrees

- 2008/12 Doctorate, Industrial Engineering, École Polytechnique de Montréal
Supervisors: Prof. Catherine Beaudry, 2005/9 - 2008/12
- 2002/12 Master's non-Thesis, Industrial Engineering, École Polytechnique de Montréal
Supervisors: Prof. Daniel Leblanc, 2000/9 -
- 1997/6 Bachelor's, Industrial Engineering, Slezska Univerzita
Supervisors: Prof. Jan Konecny, 1992/9 -

Recognitions

- 2014/12 The CMS President Award for the Best Presentation - 0
Canadian Mathematical Society
Prize / Award
My presentation won the CMS President's Award during Canadian Mathematical Society Winter Meeting, Hamilton, Canada, December 5-8, 2014
- 2008/4 Best Presentation Prize - 0
CIRST (Interuniversity Research Center on Science and Technology)
Prize / Award
My presentation won the Best Presentation Prize during the Conference on research in science and technology, CIRST, Montreal, Canada, April 2008

User Profile

Research Specialization Keywords: biotechnology, collaborative ecosystems, innovation network, modeling & simulation, nanotechnology, open innovation, R&D management, scientometrics, social network analysis

Employment

2014/5	Associate Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Associate Professor Tenure Status: Tenure
2009/8 - 2014/4	Assistant Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Assistant Professor
2005/9 - 2008/12	Research Assistant Génie industriel, École Polytechnique de Montréal
2003/1 - 2005/8	Researcher Mechanical Engineering, McGill University
1997/1 - 1997/6	Industrial Intern Economic department, Nova Hut Steelworks

Research Funding History

Awarded [n=11]

2018/5 - 2024/4 Co-investigator	Partnership for the Organization of Innovation and New Technologies, Grant Funding Sources: Social Sciences and Humanities Research Council of Canada (SSHRC) Partnership Grant Total Funding - 2,499,723 Portion of Funding Received - 100,000 Funding Competitive?: Yes
2022/11 - 2024/3 Principal Investigator	Framework for the transformation of health-related technology to the clinical setting: The role of critical actors in healthcare ecosystem, Grant Funding Sources: Fonds de recherche du Québec - Santé (FRQS) TransMedTech Innovateurs(rices) en résidence Total Funding - 37,500 Portion of Funding Received - 37,500 Funding Competitive?: Yes
2018/9 - 2023/8 Principal Investigator	Partnership for the Organization of Innovation and New Technologies, Grant Funding Sources: Concordia University Positioning in Multi-Institutional Research Organization Total Funding - 30,000 Portion of Funding Received - 30,000 Funding Competitive?: Yes
2019/5 - 2023/4 Co-investigator	Surfer sur la vague, ou subir la raz de marée? Organiser et comprendre les écosystèmes d'innovation a l'aide de nouvelles données, Grant Funding Sources: Fonds Québécois de la Recherche sur la Société et la Culture (FQRSC) Soutien aux équipes de recherche / Partenariat - renouvellement Total Funding - 603,740

Portion of Funding Received - 30,000
Funding Competitive?: Yes

2018/4 - 2023/3
Co-investigator

Text mining infrastructure for the Partnership for the Organization of Innovation and New technologies, Grant

Funding Sources:

Canada Foundation for Innovation (CFI)
John R. Evans Leaders Funds
Total Funding - 500,000
Portion of Funding Received - 20,000
Funding Competitive?: Yes

2018/1 - 2019/1
Principal Applicant

Impact of collaborative patterns on the commercialization capability of innovations, Grant

Funding Sources:

Concordia University - Faculty Research Development Program (FRDP)
Total Funding - 25,000
Portion of Funding Received - 25,000
Funding Competitive?: Yes

2015/4 - 2017/12
Principal Investigator

Formation and dynamics of the scientific activities in renewable/sustainable energy in the UAE and other GCC countries, Grant

Funding Sources:

Masdar Institute of Science and Technology
Capital Equipment Funding
Total Funding - 118,400
Portion of Funding Received - 118,400
Funding Competitive?: Yes

2013/9 - 2017/8
Co-investigator

La commercialisation des nanotechnologies au Canada - Une taxonomie des facteurs y contribuant, Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)
Insight Grant
Total Funding - 245,000
Portion of Funding Received - 100,000
Funding Competitive?: Yes

Principal Investigator : Catherine Beaudry

2015/5 - 2017/4
Principal Investigator

Formation and dynamics of the scientific activities in renewable/sustainable energy in the UAE and other GCC countries, Grant

Funding Sources:

Masdar Institute of Science and Technology
Total Funding - 167,666
Portion of Funding Received - 167,666
Funding Competitive?: Yes

2013/5 - 2017/4
Co-investigator

Programmation sur l'ouverture de l'innovation dans les nouvelles technologies, Grant

Funding Sources:

Fonds Québécois de la Recherche sur la Société et la Culture (FQRSC)
Soutien aux équipes de recherche
Total Funding - 416,416
Portion of Funding Received - 40,000
Funding Competitive?: Yes

Co-investigator : Laurent Simon; Majlinda Zhegu; Nathalie de Marcellis; Patrick Cohendet;

Principal Investigator : Catherine Beaudry

2015/3 - 2017/2
Principal Investigator Design and improvements of security solutions to be integrated in an Internet gateway,
Grant

Funding Sources:

MITACS

Accelerate Cluster

Total Funding - 323,333

Portion of Funding Received - 72,025

Funding Competitive?: Yes

Co-investigator : Jose M. Fernandes; M. Robert

Completed [n=8]

2011/5 - 2016/4
Principal Investigator Modeling and simulation of cost of quality in supply chains, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery grant

Total Funding - 115,000

Portion of Funding Received - 115,000

Funding Competitive?: Yes

2012/9 - 2014/8
Co-investigator Partenariat pour l'Ouverture de l'Innovation dans les Nouvelles Technologies (POINT),
Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

Subventions de développement de partenariat

Total Funding - 199,950

Portion of Funding Received - 34,000

Funding Competitive?: Yes

Co-investigator : Majlinda Zhegu; Nathalie de Marcellis; Patrick Conhendet;

Principal Investigator : Beaudry, Catherine

2011/5 - 2014/4
Principal Investigator Exploring the gap between academic research and its industrial application in Quebec
nanotechnology, Grant

Funding Sources:

Fonds Québécois de la Recherche sur la Société et la Culture (FQRSC)

Etablissement de nouveaux professeurs-chercheurs

Total Funding - 39,600

Portion of Funding Received - 39,600

Funding Competitive?: Yes

2012/5 - 2014/4
Principal Investigator Study of the evolving structure of scientific and technological domains in Canadian
nanotechnology, Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

Insight Development Grant

Total Funding - 75,000

Portion of Funding Received - 45,000

Funding Competitive?: Yes

Co-investigator : Catherine Beaudry

2012/5 - 2013/4 Novel approach to the evaluation of supply chain performance, Grant

Principal Investigator	Funding Sources: Concordia University Seed Funding Total Funding - 7,000 Portion of Funding Received - 7,000 Funding Competitive?: Yes
2011/5 - 2013/4 Co-investigator	Impact de la recherche subventionnée, des systèmes régionaux d'innovation, des réseaux d'innovation et des flux de connaissance sur l'innovation de haute technologie, Grant Funding Sources: Fonds Québécois de la Recherche sur la Société et la Culture (FQRSC) Soutien aux équipes de recherche Total Funding - 61,600 Portion of Funding Received - 6,500 Funding Competitive?: Yes Co-investigator : Majlinda Zhegu; Patrick Cohendet; Principal Investigator : Catherine Beaudry
2009/9 - 2012/5 Principal Investigator	Innovation networks and information transmission efficiency, Grant Funding Sources: Concordia University Start-up grant Total Funding - 75,000 Portion of Funding Received - 75,000 Funding Competitive?: No
2011/5 - 2012/4 Co-investigator	Impact des subventions publiques sur le développement des nanotechnologies : Une comparaison du Québec, du Canada et des États-Unis, Grant Funding Sources: Réseau de connaissance Ne3LS Total Funding - 25,000 Portion of Funding Received - 10,000 Funding Competitive?: Yes Principal Investigator : Beaudry, Catherine

Student/Postdoctoral Supervision

Master's Thesis [n=29]

Principal Supervisor	Neha Bala Dutt (In Progress) Student Degree Expected Date: 2024/3 Thesis/Project Title: Feasibility and economic study for conducting TAVI procedure in patients using HoloLens
Co-Supervisor	Koosha Shirouyeh (In Progress) Student Degree Expected Date: 2023/5 Thesis/Project Title: Star scientists' prediction in AI scientific ecosystem using machine learning
Co-Supervisor	Shahab Mosallaie (Completed)

Co-Supervisor	Hamid Vosoughi (In Progress) Student Degree Expected Date: 2023/8 Thesis/Project Title: The impact of various funding programs on research outcome and performance
Principal Supervisor	Shirin Tavakoli (In Progress) Student Degree Expected Date: 2025/3
Principal Supervisor	Mohammad Soleymani Far (In Progress) Student Degree Expected Date: 2023/12 Thesis/Project Title: Gender disparity in research funding and scientific productivity
Principal Supervisor	Melika Feyzi (In Progress) Student Degree Expected Date: 2024/3 Thesis/Project Title: The role of critical actors in the science-technology interactions in the clinical context of healthcare innovations
Principal Supervisor	Mahdi Rad (Completed) Thesis/Project Title: Influence of collaboration networks on commercialization in Canadian nanotechnology
Principal Supervisor	Amnah Alzeyoudi (Completed) Thesis/Project Title: The impact of gender and collaboration patterns on research performance of the scientists in the GCC countries
Principal Supervisor	Shaikha Al Alawi (Completed) Thesis/Project Title: Impact of collaboration patterns among industry, academia and government on scientific output
Principal Supervisor	Maryam Yammahi (Completed) Thesis/Project Title: Bibliometric and network analysis of renewable energy research in the GCC countries
Co-Supervisor	Elva Luz Crespo Neira (Completed) Thesis/Project Title: Influence of cognitive, geographical and collaborative proximity in knowledge production of Canadian nanotechnology
Co-Supervisor	Hadi Shahidi Nejad (Completed) Thesis/Project Title: The influences and interactions between various scientific research and technological domains in case of Canadian nanotechnology
Principal Supervisor	Arman Sadreddin (Completed) Thesis/Project Title: The impact of applying open innovation practices on performance of firms in nanotechnology industry
Principal Supervisor	Roya Kalbassi (Completed) Thesis/Project Title: Lean and green parallel implementation impact on outcomes of supply chain in Canadian aerospace industry
Principal Supervisor	Patricia Duarte (Completed) Thesis/Project Title: Quality cost analysis in the service sector: An empirical study of the Colombian banking sector
Principal Supervisor	Ayati Ehsan (Completed) Thesis/Project Title: Developing a model for cost of quality in manufacturing supply chain
Principal Supervisor	Subramanian Narasimhan Venkata (Completed) Thesis/Project Title: Investigating the factors that affect the implementation of Cost of Quality
Principal Supervisor	Wei Wei (Completed) Thesis/Project Title: Development of supply chain performance measurement tool

Principal Supervisor	Zamzami Nuha (Completed) Thesis/Project Title: Evaluating the innovation dynamics through simulation. The case of Canadian high technology industries
Principal Supervisor	Sawan Rema (Completed) Thesis/Project Title: Simulation of cost of quality in the procurement function in the construction industry
Co-Supervisor	Bani Milhim Hamzeh (Completed) Thesis/Project Title: Formulation and formalization of the enterprise innovation process
Principal Supervisor	Moazami Afshin (Completed) Thesis/Project Title: The investigations in the innovation network architecture: The comparison of the nanotechnology innovation networks in Quebec, Canada and United States
Principal Supervisor	Tajaddod Alizadeh Dorsa (Completed) Thesis/Project Title: The study on the dynamics of Canadian biotechnology innovation networks
Principal Supervisor	Eslami Hamidreza (Completed) Thesis/Project Title: The impact of the innovation network architecture on innovative performance
Principal Supervisor	Tayaran Elham (Completed) Thesis/Project Title: Investigation of the critical factors in the early stage of the innovation process in biotechnology: A system dynamics approach
2022/9 Principal Supervisor	Niushin Khamseli (In Progress) Student Degree Expected Date: 2024/10 Thesis/Project Title: Investigating science-technology interactions in the artificial intelligence collaborative ecosystem
2020/5 - 2022/8 Principal Supervisor	Mohammad Mahdi Toobae (Completed) Thesis/Project Title: Understanding geographical patterns of scientific collaboration in the field of artificial intelligence
2020/1 - 2021/12 Co-Supervisor	Anahita Hajibabaei (Completed) Thesis/Project Title: Gender-specific patterns in the artificial intelligence scientific ecosystem

Doctorate [n=9]

Co-Supervisor	Ali Ghaemmaghami (In Progress) Student Degree Expected Date: 2025/4 Thesis/Project Title: Intelligent multi-layer approach for the early detection of emerging science and technology
Principal Supervisor	Mahsa Sadat Noori Najafi (In Progress) Student Degree Expected Date: 2024/11 Thesis/Project Title: Investigation of the critical actors in collaborative ecosystems using simulation and machine learning
Principal Supervisor	Harriet Laryea (In Progress) Student Degree Expected Date: 2024/2 Thesis/Project Title: Maritime autonomous surface ships and energy management
Co-Supervisor	Alglawe Asama (Completed) Thesis/Project Title: Designing Supply Chain Based on Cost of Quality with Consideration of Quality Level

Principal Supervisor	Fahad A. Maghrabie Hesham (Completed) Thesis/Project Title: Addressing uncertainty in the Multi Criteria Decision Analysis
Principal Supervisor	Ghiasi Hafezi Gita (Completed) Thesis/Project Title: Canadian Nanotechnology and Equity Challenges: Implications for Pro-Poor and Gender-Inclusive Policy
Principal Supervisor	Abdulrahman Kassem (Completed) Thesis/Project Title: Evaluation of solar thermal power technologies in developing countries
Principal Supervisor	Ebadi Ashkan (Completed) Thesis/Project Title: Evaluation of the effect of federal funding on scientific outcome and collaboration
Co-Supervisor	Tahmooresnejad Leila (Completed) Thesis/Project Title: Impact of public funding on the development of nanotechnology: A comparison of Quebec, Canada and the US

Presentations

1. Ebadi, A. and Schiffauerova A. (2022). Towards increasing the share of female researchers' funding in science. 16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting, Bangkok, Thailand
2. Noori Najafi, M.*, and Schiffauerova A. (2022). Using simulation to investigate the role of critical actors in collaborative ecosystem. P4IE Conference – Measuring Metrics that Matter, Ottawa, Canada
3. Toobae, M. M.*, Ebadi, A. and Schiffauerova A. (2022). Understanding geographical patterns of scientific collaboration in artificial intelligence among Canadian researchers. IEEE 5th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT), Ankara, Turkey
4. Shirouyeh, K.*, Schiffauerova A. and Ebadi, A. (2022). Star scientists' prediction in the AI scientific ecosystem using machine learning. 16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting, Bangkok, Thailand
5. Shirouyeh, K.*, Ebadi, A. and Schiffauerova A. (2022). Can we predict future star scientists using machine learning?. P4IE Conference – Measuring Metrics that Matter, Ottawa, Canada
6. Ghaemmaghami, A.*, Schiffauerova A. and Ebadi, A. (2022). Using an indicator-based model to detect emerging technologies. The case of AI scientific ecosystem. IEEE 6th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT), Ankara, Turkey
7. Vosoughi, H.*, Schiffauerova A. and Ebadi, A. (2022). Investigating the impact of different research funding programs. 16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting, Bangkok, Thailand
8. Ghaemmaghami, A.*, Schiffauerova A. and Ebadi, A. (2022). Detecting emerging topics in the artificial intelligence scientific ecosystem. P4IE Conference – Measuring Metrics that Matter, Ottawa, Canada
9. Toobae, M. M.*, Ebadi, A. and Schiffauerova A. (2022). Scientific collaboration among AI researchers: Does proximity matter?. P4IE Conference – Measuring Metrics that Matter, Ottawa, Canada
10. Ghaemmaghami, A.*, Schiffauerova A. and Ebadi, A. (2022). Detecting emerging topics in the artificial intelligence scientific ecosystem. 16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting, Bangkok, Thailand
11. Noori Najafi, M.* and Schiffauerova A. (2022). Simulating scientific ecosystem to understand the role of critical actors. 16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting, Bangkok, Thailand

12. Mosallaie, S.*, Ebadi, A., and Schiffauerova A. (2021). Interpretable link prediction-based approach for scientific collaboration prediction using machine learning. Policies, Processes and Practices for Performance of Innovation Ecosystems Conference (P4IE), Ottawa, Canada
13. Rad, M.*, Sarencheh, S.*, Schiffauerova A. and Beaudry, C. (2021). Effect of social and personal characteristics of innovators on the economic performance: The study of patent commercialization in Canadian nanotechnology innovation ecosystem. Policies, Processes and Practices for Performance of Innovation Ecosystems Conference (P4IE),, Ottawa, Canada
14. Hajibabaei, A.*, Ebadi, A. and Schiffauerova A. (2021). Identifying driving factors to acquire influential roles within the fast-evolving AI ecosystem. Policies, Processes and Practices for Performance of Innovation Ecosystems Conference (P4IE), Ottawa, Canada
15. Ebadi A., Tremblay S. and Schiffauerova A. (2019). Are female researchers underrepresented in Canadian natural sciences and engineering?. 15th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and 20th COLLNET Meeting, Dalian, China
16. Schiffauerova, A. and Alzeyoudi, A.*. (2017). Framework for the Assessment of National Systems of Innovation in Biotechnology. ", 19th International Conference on Business and Systems Research, Paris, France

Publications

Journal Articles

1. Hajibabaei, A.*, Schiffauerova, A. and Ebadi, A. (2022). Women and key positions in scientific collaboration networks: Analyzing central scientists' profiles in the artificial intelligence ecosystem through gender lens. *Scientometrics*. : 1-22.
Published
Refereed?: Yes, Open Access?: No
2. Hajibabaei, A.*, Schiffauerova, A. and Ebadi, A.,. (2022). Gender-Specific Patterns in the Artificial Intelligence Scientific Ecosystem. *Journal of Informetrics*. 16(2)
Published
Refereed?: Yes, Open Access?: No
3. Mosallaie, S.*, Rad, M.*, Schiffauerova, A. and Ebadi, A. (2021). Discovering the evolution of artificial intelligence in cancer research using dynamic topic modeling. *Collnet Journal of Scientometrics and Information Management*. 15(2): 225-240.
Published
Refereed?: Yes, Open Access?: No
4. Ghiasi, G.*, Beaudry, C., Larivière, V., St-Pierre, C., Schiffauerova, A. and Harsh, M. (2021). Who profits from the Canadian nanotechnology rewards system? Implications for gender-responsible innovation. *Scientometrics*. 126(9): 7937-7991.
Published
Refereed?: Yes, Open Access?: No
5. Ghiasi, G.*, Harsh, M. and Schiffauerova, A.,. (2020). A cross-dimensional analysis of nanotechnology and equality: Examining gender fairness and pro-poor potential in Canada's R&D landscape. *Journal of Responsible Innovation*. 7(3): 528-552.
Published
Refereed?: Yes, Open Access?: No
6. Ebadi A., Tremblay S., Goutte C. and Schiffauerova A. (2020). Application of machine learning techniques to assess the trends and alignment of the funded research output. *Journal of Informetrics*. 14(2)
Published
Refereed?: Yes, Open Access?: No

7. Alglawe, A.* , Schiffauerova, A. and Kuzgunkaya, O. (2019). Analyzing the Cost of Quality within a Supply Chain Using SystemDynamics Approach. *Total Quality Management & Business Excellence*. 30(15-16): 1630-1653.
Published
Refereed?: Yes, Open Access?: No
8. Maghrabie, H.* , Beauregard, Y and Schiffauerova, A. (2019). Grey-based Multi-Criteria Decision Analysis Approach: AddressingUncertainty at Complex Decision Problems. *Technological Forecasting & Social Change*. 146: 366-379.
Published
Refereed?: Yes, Open Access?: No
9. Alglawe, A.* , Kuzgunkaya, O. and Schiffauerova, A. (2019). Managing Quality Decisions in Supply Chain. *International Journal of Quality and Reliability Management*. 31(1): 34-52.
Published
Refereed?: Yes, Open Access?: No
10. Alglawe, A.* , Schiffauerova, A., Kuzgunkaya, O. and I. Shiboub. (2019). Supply Chain Network Design Based on Cost of Quality and Quality LevelAnalysis. *The Total Quality Management Journal*. 31(3): 467-490.
Published
Refereed?: Yes, Open Access?: No
11. Maghrabie, H.* , Beauregard, Y. and Schiffauerova, A. (2019). Multi-Criteria Decision Making Problems with Unknown Weight Informationunder Uncertain Evaluations. *Computers & Industrial Engineering*. 133: 131-138.
Published
Refereed?: Yes, Open Access?: No
12. Wei, W.* , Low, J.F.* and Schiffauerova, A. (2018). Nobody Wants to BuySour Milk: Supply Chain Performance Measure Matters. *International Journal of Logistics Systems and Management*. 29(1): 62-81.
Published
Refereed?: Yes, Open Access?: No
13. Sawan, R.* , Low, J.F.* and Schiffauerova, A. (2018). Quality cost of material procurement in construction projects: A system dynamics perspective. *Engineering, Construction and Architectural Management*. 25(8): 974-988.
Published
Refereed?: Yes, Open Access?: No
14. Duarte Arenas, P.* , Low, J.F.* and Schiffauerova, A. (2018). Balancing Risk andRevenue: a Study of Quality Cost in Banking Industry. *International Journal of Quality and Reliability Management*. 35(10): 2181-2194.
Published
Refereed?: Yes, Open Access?: No
15. Ghiasi, G.* , Harsh, M. and Schiffauerova, A. (2018). Inequality and collaboration patterns in Canadian nanotechnology:implications for pro-poor and gender inclusive policy. *Scientometrics*. 115(2): 785-815.
Published
Refereed?: Yes, Open Access?: No
16. Tajaddod Alizadeh, D.* and Schiffauerova, A. (2017). Evaluation of Effects of Collaborative Patternson the Efficiency of Scientific Networks Using Simulation. *International Journal of Innovation Management*. 22(4)
Published
Refereed?: Yes, Open Access?: No

17. Zamzami, N.* and Schiffauerova, A. (2017). The Impact of Individual Collaborative Activities on Knowledge Creation and Transmission. *Scientometrics*. 111(3): 1385-1413.
Published
Refereed?: Yes, Open Access?: No

Book Chapters

1. Low, J.F, Al-Yammahi, M.R.D. and Schiffauerova, A. (2017). The Gulf's Region Commitment to a Sustainable Lifestyle: A Bibliometric Study. E. Azar and M.A. Raouf. *Sustainability in the Gulf: Challenges and Opportunities*. : 7-28.
Published, Routledge
Refereed?: Yes



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Protected when completed

Dr. Chun Wang

Correspondence language: English

Contact Information

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Address

Courier (*)

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This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Dr. Chun Wang

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	No	No	No	No	No
Mandarin Chinese	Yes	Yes	Yes	Yes	Yes

Degrees

- 2008/2 Doctorate, Computer Engineering, University of Western Ontario
Supervisors: Hamada H. Ghenniwa, 2004/1 - 2008/2
- 2004/1 Master's Thesis, Computer Engineering, University of Western Ontario
Supervisors: Hamada H. Ghenniwa, 2002/1 - 2003/12
- 1990/7 Bachelor's, Information Engineering, Huazhong , University of Science & Technology

User Profile

Research Specialization Keywords: Intelligent Transportation Systems, Sustainable and Socially-Oriented Mobility, Decentralized Optimization, Mechanism Design, Multiagent Systems, Game Theory

Employment

- 2020/6 Professor
Concordia Institute for Information Systems Engineering, Concordia University
Full-time, Professor
Tenure Status: Tenure
- 2013/6 - 2020/5 Associate Professor
Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2008/6 - 2013/6 Assistant Professor
Concordia Institute for Information Systems Engineering, Concordia University
Full-time, Assistant Professor
Tenure Status: Tenure Track
- 1990/7 - 2000/11 Telecommunication Engineer
Telecommunications Services, China National Petroleum Co., Ltd

Research Funding History

Awarded [n=6]

2023/4 - 2028/3 Principal Applicant	Stable Matching Mechanisms for Shared Mobility Systems, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 210,000 Portion of Funding Received - 210,000 Funding Competitive?: Yes
2022/2 - 2024/3 Principal Investigator	A Social Welfare Maximization Matching Framework for Supplemental Nurse Staffing, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 200,000 Portion of Funding Received - 200,000 Funding Competitive?: Yes
2023/5 - 2023/11 Principal Investigator	From meal planning to grocery shopping cart; a smart software platform combining personalized recommendations, grocery shopping, and healthy-eating-behavior building, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 60,000 Portion of Funding Received - 30,000 Funding Competitive?: No Co-investigator : Jun Yan; Yong Zeng
2021/6 - 2023/6 Principal Investigator	Data-Driven Optimization Framework for Next Generation Manufacturing, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 346,666 Portion of Funding Received - 346,666 Funding Competitive?: Yes
2016/5 - 2022/4 Principal Investigator	Dynamic Scheduling Mechanism Design in Multi-Agent Systems, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grants - Individual Total Funding - 120,000 Portion of Funding Received - 120,000 Funding Competitive?: Yes
2020/11 - 2021/2 Principal Investigator	An efficient heuristic algorithm for laboratory analysis profile selection, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 15,000 Portion of Funding Received - 15,000

Funding Competitive?: No

Completed [n=3]

- 2019/11 - 2021/8
Principal Investigator Data driven energy efficient base station sleep control for 5G systems, Grant
Funding Sources:
Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 53,333
Portion of Funding Received - 53,333
Funding Competitive?: Yes
- 2018/1 - 2018/6
Principal Investigator A decision support framework for optimizing tube utilization in laboratory tests, Grant
Funding Sources:
Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 15,000
Portion of Funding Received - 15,000
Funding Competitive?: Yes
- 2016/10 - 2017/4
Principal Investigator Agent-based scheduling in community health care, Grant
Funding Sources:
Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 15,000
Portion of Funding Received - 15,000
Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=10]

- 2022/1 - 2023/12
Principal Supervisor Normandin-Taillon, Hubert (In Progress) , Concordia University
Student Degree Expected Date: 2023/5
Thesis/Project Title: Data-Driven Models for Portfolio Optimization
Present Position: Research assistant, Concordia University
- 2021/5 - 2023/5
Principal Supervisor Farhat, Abdallah (Completed) , Concordia University
Thesis/Project Title: Evaluation of Citation Graph Thematic Dataset Construction and Paper Filtering Methods for Research Literature Recommendation
Present Position: Research assistant
- 2021/5 - 2023/3
Principal Supervisor Annabathuni, Sandeep Chowdary (Completed) , Concordia University
Thesis/Project Title: Mitigating the Cold-Start Problem by Leveraging Category Level Associations
Present Position: Research assistant
- 2021/5 - 2023/3
Principal Supervisor Zaeimi, Mohammadmahdi (Completed) , Concordia University
Thesis/Project Title: Simulation platform design for mobility on demand systems
Present Position: Research assistant

2021/5 - 2023/12 Principal Supervisor	Ta, Andy (In Progress) , Concordia University Student Degree Expected Date: 2023/5 Thesis/Project Title: Text mining algorithms for nurse agency services Present Position: Research assistant
2020/1 - 2023/7 Principal Supervisor	Shi, Fangzhu (Completed) , Concordia University Thesis/Project Title: Demand forecasting in medical supply chains Present Position: Research Associate
2017/9 - 2019/8 Co-Supervisor	Hu, Chengming (Completed) , Concordia University Thesis/Project Title: Machine learning algorithms for smart grid security Present Position: PhD student at McGill University
2017/9 - 2019/8 Principal Supervisor	Hou, Shixuan (Completed) , Concordia University Thesis/Project Title: Dynamic two sided matching algorithms Present Position: PhD student at Concordia University
2017/1 - 2020/8 Principal Supervisor	Rezaei, Narges (Completed) , Concordia University Thesis/Project Title: A DATA-DRIVEN OPTIMIZATION METHOD FOR TAXIDISPATCHING PROBLEM Present Position: MBA program, University of Toronto
2015/9 - 2017/11 Principal Supervisor	Rezaei, Hamidreza (Completed) , Concordia University Thesis/Project Title: Modellingand Solving Decentralized and Dynamic Aircraft Landing Scheduling Problems Present Position: Research associate
Doctorate [n=14]	
2023/9 - 2027/8 Co-Supervisor	Sarah Farahdel (In Progress) , Concordia University Student Degree Expected Date: 2027/8 Thesis/Project Title: Sustainability Assessment Framework Present Position: Research assistant
2023/1 - 2026/12 Principal Supervisor	Nima Moradi (In Progress) , Concordia University Student Degree Expected Date: 2026/12 Thesis/Project Title: Sustainable and smart last mile delivery Present Position: Research assistant
2022/9 - 2026/8 Principal Supervisor	Rasoolabadi, Mozhddeh Noroozi (In Progress) , Concordia University Student Degree Expected Date: 2026/8 Thesis/Project Title: Group Role Assignment with Constraints Present Position: Research assistant, Concordia University
2021/9 - 2025/9 Co-Supervisor	Valipour, Mahsa (In Progress) , Concordia University Student Degree Expected Date: 2025/9 Thesis/Project Title: Matching mechanism design for home healthcare services Present Position: Research assistant, Concordia University
2020/9 - 2024/9 Co-Supervisor	Nejadshamsi, Shayan (In Progress) , Concordia University Student Degree Expected Date: 2024/9 Thesis/Project Title: Agent-based simulation on urban transportation networks Present Position: PhD student at Concordia University
2020/5 - 2024/1 Co-Supervisor	Seyedan, Seyedehmahya (In Progress) , Concordia University Student Degree Expected Date: 2024/1 Thesis/Project Title: Machine learning methods for supply chain demand forecasting Present Position: Research Associate

- 2020/1 - 2024/12
Principal Supervisor Xu, Xinkai (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Data driven optimization
Present Position: Research Associate
- 2019/9 - 2024/8
Principal Supervisor Hou, Shixuan (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: Two-sided market optimization through simulation
Present Position: Research Associate
- 2018/9 - 2024/7
Co-Supervisor Rahman, Osmud (In Progress) , Concordia University
Student Degree Expected Date: 2024/7
Thesis/Project Title: Text mining for meta-analysis Cross-cultural research on fashion consumption
Present Position: Associate professor, Ryerson University
- 2017/5 - 2022/9
Principal Supervisor Li, Xiaoming (Completed) , Concordia University
Thesis/Project Title: Data Driven Optimization Methods
Present Position: Research Associate, Concordia University
- 2016/11 - 2019/3
Co-Supervisor Liu, Lu (Completed) , Dalian University of Technology
Thesis/Project Title: MechanismDesign for Operation Room Scheduling Considering Surgeons' Time Preferences
Present Position: University lecture, Zhejiang University of Technology
- 2016/9 - 2021/12
Principal Supervisor Gao, Jie (Completed) , Concordia University
Thesis/Project Title: Matching mechanisms for two-sided shared mobility systems
Present Position: Postdoctorial Fellow, HEC Montreal
- 2016/9 - 2020/11
Co-Supervisor Hou, Luyang (Completed) , Concordia University
Thesis/Project Title: Auction Mechanisms for Electric Vehicle Charging Scheduling
Present Position: Research Scientist, Beijing University of Posts and Telecommunications
- 2015/9 - 2021/4
Principal Supervisor Crespo, Antonio Márcio Ferreira (Completed) , Concordia University
Thesis/Project Title: Computational Learning Framework for Carbon Emissions Predictions Incorporating a RReliefF Driven Features Selection and an Iterative Neural Network Architecture Improvement
Present Position: Director, UNICA Institute, Montreal

Post-doctorate [n=2]

- 2022/1 - 2022/4
Principal Supervisor Kafiabad, Shayan Tavakoli, Concordia University
Thesis/Project Title: Machine learning methods for stochastic inventory models
Present Position: Unknown
- 2022/1 - 2022/10
Principal Supervisor Gao, Jie, Concordia University
Thesis/Project Title: Data-driven optimization models for mobility on demand
Present Position: Postdoctorial Fellow, HEC Montreal

Research Associate [n=1]

- 2018/1 - 2020/1
Principal Supervisor Wong, Terrence (Completed) , Concordia University
Thesis/Project Title: Design and implementation of a simulation platform for mobility on demand applications
Present Position: Software Engineer, Duolingo USA

Event Administration

2023/3 - 2023/9 Publication chair, The 23rd IEEE International Conference on Scalable Computing and Communications, Aug. 2023, UK, Conference, 2023/8 - 2023/8

Editorial Activities

2018/11 - 2022/12 Associate Editor, IET Collaborative Intelligent Manufacturing, Journal
 2018/5 - 2022/12 Reviewer, IEEE Transactions on Intelligent Transportation Systems, Journal
 2020/1 - 2020/10 Reviewer, Advanced Engineering Informatics, Journal
 2020/4 - 2020/5 Reviewer, IEEE Access, Journal
 2018/4 - 2018/5 Reviewer, International Journal of Production Research, Journal
 2017/1 - 2018/1 Reviewer, IEEE Transactions on System, Man and Cybernetics, Journal
 2017/5 - 2017/6 Reviewer, Artificial Intelligence in Medicine, Journal

Organizational Review Activities

2021/12 - 2022/1 External Reviewer, Natural Sciences and Engineering Research Council of Canada (NSERC)
 Discovery grant external reviewer
 2021/5 - 2021/6 External Reviewer, Mathematics of Info Tech & Complex Systems
 External reviewer for a Mitacs Accelerate grant application

International Collaboration Activities

2022/8 - 2022/12 Lead Researcher, United States of America
 Collaborative project with a professor at Texas Tech University on learning from crowdsourced labeling on shared mobility data. I am in the process of developing a grant application on data driven shared mobility system optimization. The professor at Texas Tech will contribute by providing support on crowdsourced labeling techniques.
 2022/3 - 2022/12 Research Collaborator, Ireland
 Collaborative project on e-bike energy consumption prediction, charging management and fleet assignment optimization with a professor from Dublin City University and a local e-bike service provider in Dublin.
 2020/8 - 2021/7 Research Collaborator, China
 Collaborative project on emergency medical supply chain management. I worked with professors at Huazhong University of Science and Technology. I was involved in the development of their funding application and data analysis.

Text Interviews

2020/02/05 Building a better blood test: With increasing demands for health security across the world, Canadian researchers seek to reinforce hospital systems for quicker diagnoses, The Globe and Mail. The content of this interview as based on my collaboration activities with Jewish General Hospital Montreal and Medialpha Inc.

Publications

Journal Articles

1. Nejadshamsi, Shayan; Eicker, Ursula; Wang, Chun; Bentahar, Jamal. (2023). Data sources and approaches for building occupancy profiles at the urban scale – A review. *Building and Environment*. 238: 110375.
Published
Refereed?: Yes, Open Access?: No
2. Hou, Luyang; Li, Yuanliang; Yan, Jun; Wang, Chun; Wang, Li; Wang, Biao. (2023). Multi-agent reinforcement mechanism design for dynamic pricing-based demand response in charging network . *International Journal of Electrical Power and Energy Systems*. 147(May): 108843.
Published
Refereed?: Yes, Open Access?: No
3. Hou*, Shixuan; Gao*, Jie; Wang, Chun. (2023). Optimization Framework for Crowd-Sourced Delivery Services with the Consideration of Shippers' Acceptance Uncertainties. *IEEE Transactions on Intelligent Transportation Systems*. 24(1): 684-693.
Published
Refereed?: Yes, Open Access?: No
4. Nejadshamsi, Shayan Eicker, Ursula Wang, Chun Bentahar, Jamal. (2023). Data sources and approaches for building occupancy profiles at the urban scale – A review. *Building and Environment*. 238: 110375.
Published
Refereed?: Yes, Open Access?: No
5. Seyedan, Mahya; Mafakheri, Fereshteh; Wang, Chun. (2023). Order-up-to-level inventory optimization model using time-series demand forecasting with ensemble deep learning. *Supply Chain Analytics*. 3: 100024.
Published
Refereed?: Yes, Open Access?: Yes
6. Hou*, Shixuan; Gao*, Jie; Wang, Chun. (2022). Design for Supply Chain, Design for Mass Customization and Design for Manufacturing: A Review of the Literature. *IET Collaborative Intelligent Manufacturing*. 4(1): 1-16.
Published
Refereed?: Yes, Open Access?: Yes
7. Liu*, Lu; Wang, Chun; Wang, Jian-Jun; Crespo*, Antonio Marcio Ferreira. (2022). An iterative auction for resource-constrained surgical scheduling. *Journal of the Operational Research Society*, <https://doi.org/10.1080/01605682.2022.2083988>.
In Press
Refereed?: Yes, Open Access?: No
8. Hou*, Luyang; Yan, Jun; Wang, Chun; Ge, Lei Jiao. (2022). A Simultaneous Multi-Round Auction Design for Scheduling Multiple Charges of Battery Electric Vehicles on Highways. *IEEE Transactions on Intelligent Transportation Systems*. 23(7): 8024-8036.
Published
Refereed?: Yes, Open Access?: No
9. Gao*, Jie; Li*, Xiaoming; Wang*, Chun; Huang, Xiao. (2022). BM-DDPG: An Integrated Dispatching Framework for Ride-Hailing Systems. *IEEE Transactions on Intelligent Transportation Systems*. 23(8): 11666-11676.
Published
Refereed?: Yes, Open Access?: No

10. Li*, Xiaoming; Gao*, Jie; Wang, Chun; Huang, Xiao; Nie, Yimin. (2022). Ride-Sharing Matching under Travel Time Uncertainty through Data-Driven Robust Optimization. IEEE Access.
Accepted
Refereed?: Yes, Open Access?: Yes
11. Li*, Xiaoming; Wang, Chun; Huang, Xiao. (2022). A Data-Driven Approach for Vehicle Relocation in Car-Sharing Services with Balanced Supply-Demand Ratios. International Journal of Intelligent Transportation Systems Research. 20(1): 75-89.
Published
Refereed?: Yes, Open Access?: No
12. Li*, Xiaoming; Gao*, Jie; Wang, Chun; Huang, Xiao; Nie, Yimin. (2022). Mixture Density Networks Enabled Stochastic Optimization for Idle Vehicle Proactive Guidance in Ride-Hailing Systems. IEEE Systems, Man, and Cybernetics Magazine.
Accepted
Refereed?: Yes, Open Access?: No
13. Gao*, Jie; Wong*, Terrence; Selim, Bassant; Wang, Chun. (2022). VOMA: A Privacy-Preserving Matching Mechanism Design for Community Ride-Sharing. IEEE Transactions on Intelligent Transportation Systems. 10.1109/TITS.2022.31
In Press
Refereed?: Yes, Open Access?: No
14. Seyedan*, Mahya; Mafakheri, Fereshteh; Wang, Chun. (2022). Cluster-based demand forecasting using Bayesian model averaging: An ensemble learning approach. Decision Analytics Journal. 3: 100033.
Published
Refereed?: Yes, Open Access?: Yes
15. Gao*, Jie; Li*, Xiaoming; Wang, Chun; Huang, Xiao. (2022). A pricing mechanism for ride-hailing systems in the presence of driver acceptance uncertainty. IEEE Access. 10: 83017-83028.
Published
Refereed?: Yes, Open Access?: Yes
16. Gao*, Jie; Wang, Chun; Yu, Jiayuan; Wong*, Terrence. (2021). A Price-Based Iterative Double Auction for Charger Sharing Markets. IEEE Transactions on Intelligent Transportation Systems, DOI: 10.1109/TITS.2020.3047984. 23(6): 5116-5127.
Published
Refereed?: Yes, Open Access?: No
17. Gao*, Jie; Wang, Chun; Wong, Terrence. (2021). Social welfare maximizing taxi fleet charging scheduling through voting-based negotiation. Transportation Research Part C, <https://doi.org/10.1016/j.trc.2021.103304>. 130: 103304.
Published
Refereed?: Yes, Open Access?: No
18. Crespo*, Antonio M.F.; Wang, Chun; Crespo, Thiago M.F.; Li, Weigang; Barreto, Alexandre. (2021). Learning Framework for Carbon Emissions Predictions Incorporating a ReliefF Driven Features Selection and an Iterative Neural Network Architecture Improvement. SN Applied Sciences, <https://doi.org/10.1007/s42452-021-04411-z>. 3(4): 1-18.
Published
Refereed?: Yes
19. Hou*, Luyang; Wang, Chun; Yan, Jun. (2020). Bidding for Preferred Timing: An Auction Design for Electric Vehicle Charging Station Scheduling. IEEE Transactions on Intelligent Transportation Systems. 21(8): 3332-3343.
Published
Refereed?: Yes, Open Access?: No

20. Fan, Guodong; Zhu, Ming; Li, Jing; Wang, Chun; Zhao, Lei. (2020). A Graph Database-based Approach Utilizing FAHP and Directed Bipartite Graph for Service Composition. *Service Oriented Computing and Applications*. 14(4): 269-281.
Published
Refereed?: Yes, Open Access?: No
21. Hou*, Luyang; Yan, Jun; Wang, Chun. (2020). An Incentive-Compatible Combinatorial Auction Design for Charging Network Scheduling of Battery Electric Vehicles. *Journal of Integrated Design & Process Science*. 24(2): 75-92.
Published
Refereed?: Yes, Open Access?: No
22. Liu*, Lu; Wang, Chun; Jian-Jun Wang. (2019). A combinatorial auction mechanism for surgical scheduling considering surgeon's private availability information. *Journal of Combinatorial Optimization*. 37(1): 405-417.
Published
Refereed?: Yes, Open Access?: No
23. Gao*, Jie; Wong*, Terrence; Wang, Chun. (2019). Coordinating Patient Preferences through Automated Negotiation: A Multiagent Systems Model for Diagnostic Services Scheduling. *Advanced Engineering Informatics*. 42: 100934.
Published
Refereed?: Yes, Open Access?: No
24. Gao*, Jie; Xie*, Zhijie; Wang, Chun. (2018). A Market-Based Scheduling Mechanism Design for Cost Reduction in Home Health Care. *Journal of Integrated Design and Process Science*,. 22(4): 41-54.
Published
Refereed?: Yes, Open Access?: No

Book Chapters

1. Hou*, Luyang; Wang, Chun; Yan, Jun. (2019). Electric Vehicle Charging Scheduling in Green Logistics: Challenges, Approaches and Opportunities. *Sustainable City Logistics Planning: A multi-criteria perspective*. : Vol. 2.
Published, Nova Science Publishers, Inc.
Refereed?: Yes
2. Crespo*, Antonio; Wang, Chun. (2019). European Union Emissions Trading Scheme: Design evolution and effectiveness analysis. Anjali Awasthi, Katarzyna Grzybowska. *Handbook of Research on Interdisciplinary approaches to sustainable supply chain management*. : 189-210.
Published, IGI Global
Refereed?: Yes

Conference Publications

1. Rasoolabadi, Mozhdah Noroozi; Zhu, Haibin; Wang, Chun. (2023). Solving the Many to Many Grouped Task Allocation Problem via E-CARGO. 20th IEEE International Conference on Networking, Sensing and Control, Marseille, France
Conference Date: 2023/10
Paper
Accepted
Refereed?: Yes, Invited?: No

2. Li, Xiaoming; Normandin-Taillon, Hubert; Wang, Chun; Huang, Xiao. (2023). Demand Density Forecasting in Mobility-on-Demand Systems through Recurrent Mixture Density Networks. IEEE 26th International Conference on Intelligent Transportation Systems. IEEE 26th International Conference on Intelligent Transportation Systems (ITSC 2023), Bilbao, Spain
Conference Date: 2023/9
Paper
Accepted
Refereed?: Yes, Invited?: No
3. Hou*, Luyang; Wang, Chun. (2022). Optimal Power Management for the Integrated Multiple Energy Carrier System. The 35th Canadian Conference on Electrical and Computer Engineering (CCECE 2022), Halifax, Canada
Conference Date: 2022/9
Paper
Accepted
Refereed?: Yes, Invited?: No
4. Li*, Xiaoming; Gao*, Jie; Wang, Chun; Huang, Xiao; Nie, Yimin. (2021). Driver guidance and rebalancing in ride-hailing systems through mixture density networks and stochastic programming. 2021 IEEE International Smart Cities Conference (ISC2). IEEE International Smart Cities Conference 2021, Manchester, United Kingdom
Conference Date: 2021/9
Paper
Published
Refereed?: Yes, Invited?: No
5. Li*, Xiaoming; Gao*, Jie; Wang, Chun; Huang, Xiao; Nie, Yimin. (2021). Ride-sharing matching under travel time uncertainty through a data-driven robust optimization approach. 2021 IEEE International Intelligent Transportation Systems Conference (ITSC). 2021 IEEE International Intelligent Transportation Systems Conference (ITSC), Indianapolis, United States of America
Conference Date: 2021/9
Paper
Published
Refereed?: Yes, Invited?: No
6. Li*, Xiaoming; Gao*, Jie; Wang, Chun; Huang, Xiao; Nie, Yimin. (2021). Order dispatching in ride-sharing platform under travel time uncertainty: a data-driven robust optimization approach. 2021 IEEE International Conference on Autonomous Systems (ICAS). 2021 IEEE International Conference on Autonomous Systems (ICAS), Montreal, Canada
Conference Date: 2021/8
Paper
Published
Refereed?: Yes, Invited?: No
7. Li*, Xiaoming; Wang, Chun; Huang, Xiao; Nie, Yimin. (2020). A Data-Driven Dynamic Stochastic Programming Framework for Ride-Sharing Rebalancing Problem under Demand Uncertainty. 2020 IEEE Intl Conf on Parallel & Distributed Processing with Applications, Big Data & Cloud Computi. 18th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA), Exeter, United Kingdom (1120-1125)
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No

8. Gao*, Jie; Li*, Xiaoming; Wang, Chun. (2020). Learning-based open driver guidance and rebalancing for reducing riders' wait time in ride-hailing platforms. Proceedings of 2020 IEEE International Smart Cities Conference. 2020 IEEE International Smart Cities Conference (ISC2), Piscataway, United States of America (342-348)
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
9. Li*, Xiaoming; Wang, Chun; Huang, Xiao. (2020). Reducing Car-Sharing Relocation Cost through Non-Parametric Density Estimation and Stochastic Programming. 2020 IEEE 23rd International Conference on Intelligent Transportation Systems (ITSC). 2020 IEEE 23rd International Conference on Intelligent Transportation Systems (ITSC), Rhodes, Greece
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
10. Hou*, Luyang; Ma, Shuai; Yan, Jun; Wang, Chun; Yu, Jia Yuan. (2020). Reinforcement Mechanism Design for Electric Vehicle Demand Response in Microgrid Charging Stations. 2020 International Joint Conference on Neural Networks (IJCNN). 2020 International Joint Conference on Neural Networks (IJCNN), Glasgow, United Kingdom
Conference Date: 2020/2
Paper
Published
Refereed?: Yes, Invited?: No
11. Hu*, Chengming; Yan, Jun; Wang, Chun. (2019). Robust Feature Extraction and Ensemble Classification Against Cyber-Physical Attacks in the Smart Grid. 2019 IEEE Electrical Power and Energy Conference (EPEC). The annual IEEE Canada Electrical Power and Energy Conference (EPEC 2019), Montréal, Canada
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
12. Fan, Guodong; Zhu, Ming; Li, Jing; Wang, Chun; Zhao, Lei. (2019). A Graph Database-based Approach Utilizing FAHP and Directed Bipartite Graph for Service Composition. The 17th International Conference on Service-Oriented Computing (ICSOC 2019), Toulouse, France
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
13. Gao*, Jie; Wang, Chun; Yu, Jia Yuan. (2019). Scheduling Electric Vehicles to Chargers through Iterative Double Auction Mechanism. 2019 IEEE International Smart Cities Conference (ISC2). 5th IEEE International Smart Cities Conference (ISC2 2019), Casablanca, Morocco (342-348)
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No

14. Hu*, Chengming; Yan, Jun; Wang, Chun. (2019). Advanced Cyber-Physical Attack Classification with Extreme Gradient Boosting for Smart Transmission Grids. 2019 IEEE Power & Energy Society General Meeting (PESGM). 2019 IEEE Power and Energy Society General Meeting, Atlanta, United States of America
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
15. Hou*, Luyang; Yan, Jun; Wang, Chun. (2019). Accommodating More Users in Highway Electric Vehicle Charging through Coordinated Booking: A Market-Based Approach. 2019 IEEE 23rd International Conference on Computer Supported Cooperative Work in Design (CSCWD). International Conference on Computer Supported Cooperative Work in Design, Porto, Portugal
Conference Date: 2019/5
Paper
Published
Refereed?: Yes, Invited?: No
16. Rezaei*, Hamid; Crespo*, Antonio M. F.; Chen, Mingyuan; Wang*, Chun. (2018). An Iterative Bidding Approach Applied to Cost Reduction in the Context of Aircraft Landing Problem. IEEE 22nd International Conference on Computer Supported Cooperative Work in Design, Nanjing, China (1-6)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No
17. Gao*, Jie; Wang, Chun. (2018). Automated Negotiation Protocol for Collaborative Diagnostic Services Scheduling. 2018 IEEE 22nd International Conference on Computer Supported Cooperative Work in Design ((CSCWD)). IEEE 22nd International Conference on Computer Supported Cooperative Work in Design, Nanjing, China (140-145)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No
18. Hou*, Luyang; Wang, Chun. (2017). Market-based mechanisms for smart grid management: Necessity, applications and opportunities. IEEE International Conference on Systems, Man, and Cybernetics, (2613-2618)
Conference Date: 2017/10
Paper
Published
Refereed?: Yes, Invited?: No



Protected when completed

Date Submitted: 2022-10-28 11:12:50

Confirmation Number: 1531796

Template: NSERC_Researcher

Dr. LINGYU WANG

Correspondence language: English

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Protected when completed

Dr. LINGYU WANG

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes

Degrees

- 2006/6 Doctorate, Information Technology, George Mason University
Supervisors: Sushil Jajodia and Duminda Wijesekera, 2000/8 - 2006/7

Recognitions

- 2022/10 Google Scholar Citation and H-index
Google Scholar
Citation
Citations > 7000 h-index = 42 according to Google Scholar as of October 2022
- 2019/9 - 2024/8 Industrial Research Chair (IRC)
Natural Sciences and Engineering Research Council of Canada (NSERC)
Distinction
Holder of NSERC/Ericsson Industrial Research Chair (IRC) in SDN/NFV Security
- 2019/7 Best Paper Award
33rd Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC 2019)
Prize / Award
Best Paper Award
- 2018/7 Best Student Paper Award
32nd Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC 2018)
Prize / Award
Best Student Paper Award

User Profile

Research Specialization Keywords: Cloud Security, SDN/NFV Security, Container Security, Security Metrics, Threat Modeling, Security Auditing, Attack Detection, Attack Mitigation

Employment

2017/6	Professor Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science, Concordia University Full-time, Professor Tenure Status: Tenure
2010/6 - 2017/5	Associate Professor Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science, Concordia University Full-time, Associate Professor Tenure Status: Tenure
2006/8 - 2010/6	Assistant Professor Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science, Concordia University Full-time, Assistant Professor Tenure Status: Tenure Track

Research Funding History

Awarded [n=3]

2019/9 - 2024/8 Principal Investigator	SDN/NFV Security: Compliance-Driven Monitoring, Detection, and Mitigation, Grant Funding Sources: Canada Foundation for Innovation (CFI) John R. Evans Leaders Fund – Partnerships Total Funding - 233,103 Portion of Funding Received - 233,103 Funding Competitive?: Yes
2019/9 - 2024/8 Principal Investigator	NSERC/Ericsson Industrial Research Chair (IRC) in SDN/NFV Security, Research Chair Funding Sources: Ericsson Research Canada Total Funding - 625,000 Portion of Funding Received - 625,000 Funding Competitive?: Yes Concordia University Total Funding - 568,970 Portion of Funding Received - 568,970 Funding Competitive?: Yes Natural Sciences and Engineering Research Council of Canada (NSERC) Industrial Research Chair Total Funding - 625,000 Portion of Funding Received - 625,000 Funding Competitive?: Yes
2017/4 - 2023/3 Principal Investigator	Improving the Resilience of Computing Infrastructures against Zero Day Attacks through Quantitative Threat Modeling and Network Hardening, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Total Funding - 156,000 Portion of Funding Received - 156,000

Funding Competitive?: Yes

Completed [n=4]

2018/1 - 2019/8
Principal Investigator

Auditing and Monitoring the Security of NFV and SDN-based Cloud Environments, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
CRD

Total Funding - 313,050

Portion of Funding Received - 313,050

Funding Competitive?: Yes

Ericsson Research Canada

CRD

Total Funding - 180,000

Portion of Funding Received - 180,000

Funding Competitive?: Yes

2015/1 - 2017/12
Principal Investigator

Audit Ready Cloud, Grant

Funding Sources:

Ericsson Research Canada

CRD

Total Funding - 105,000

Portion of Funding Received - 105,000

Funding Competitive?: Yes

Natural Sciences and Engineering Research Council of Canada (NSERC)

CRD

Total Funding - 182,610

Portion of Funding Received - 182,610

Funding Competitive?: Yes

2013/4 - 2017/3
Principal Investigator

A Vulnerability-Centric Approach to Network Security Metrics, Grant

Funding Sources:

The Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery Grant

Total Funding - 110,000

Portion of Funding Received - 110,000

Funding Competitive?: Yes

2013/8 - 2016/7
Co-investigator

Software Fingerprinting for Automated Malicious Code Analysis, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

DNDPJ

Total Funding - 208,695

Portion of Funding Received - 40,000

Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=10]

2022/9 - 2024/8 Co-Supervisor	Jia Wei Yao (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: Proactive Security Enforcement for 5G Core Present Position: Master Student, Concordia University
2020/9 - 2023/4 Co-Supervisor	Mahmood Gholipour (In Progress) , Concordia University Student Degree Expected Date: 2023/4 Thesis/Project Title: Security Auditing for 5G Core and Edge Multi-Cluster Environments Present Position: Master Student, Concordia University
2019/9 - 2022/12 Co-Supervisor	Hugo Kermabon-Bobinnec (In Progress) , Concordia University Student Degree Expected Date: 2022/12 Thesis/Project Title: Universal Security Hardening of 5G Core Functions through Provenance Analysis Present Position: Master Student, Concordia University
2018/9 - 2020/9 Co-Supervisor	Sudershan Lakshmanan (Completed) , Concordia University Thesis/Project Title: Caught-in-Translation (CiT): Modeling and Detecting Cross-level Inconsistency Attacks in Network Functions Virtualization (NFV) Present Position: IT Security Engineer, University of Basel (Switzerland)
2017/9 - 2019/8 Principal Supervisor	Gagandeep Singh Chawla (Completed) , Concordia University Thesis/Project Title: A State-Based Proactive Approach to Network Isolation Verification in Clouds Present Position: Security Engineer, Amazon AWS
2016/9 - 2018/8 Co-Supervisor	Momen Oqaily (Completed) , Concordia University Thesis/Project Title: Protecting Audit Data Using Segmentation-based Anonymization for Multi-tenant Cloud Auditing Present Position: Ph.D. student, Concordia University
2016/1 - 2017/12 Principal Supervisor	Amir Alimohammadifar (Completed) , Concordia University Thesis/Project Title: Verifying Network Topology in Software Defined Networks Using a Stealthy Probing-Based Verification (SPV) Present Position: Site Reliability Engineer II, Skytap
2015/1 - 2017/4 Principal Supervisor	Yushun Wang (Completed) , Concordia University Thesis/Project Title: TenantGuard: Scalable Runtime Verification of Cloud-Wide VM-Level Network Isolation Present Position: Security Developer, World Anti-Doping Agency
2014/9 - 2019/1 Principal Supervisor	Alis Rasic (Completed) , Concordia University Thesis/Project Title: Anonymization of Event Logs for Network Security Monitoring Present Position: Software Engineer, Above Security (Hitachi)
2014/9 - 2018/2 Principal Supervisor	Yue Xin (Completed) , Concordia University Thesis/Project Title: Common Attack Surface Detection Present Position: Application Support Analyst, Société Générale, Canada

Doctorate [n=15]

2020/9 - 2024/4 Co-Supervisor	Sima Bagheri (In Progress) , Concordia University Student Degree Expected Date: 2024/4 Thesis/Project Title: Cluster-Level Proactive Security Mitigation for 5G Core Functions Present Position: PhD Student, Concordia University
2020/1 - 2023/6 Co-Supervisor	A S M Asadujjaman (In Progress) , Concordia University Student Degree Expected Date: 2023/6 Thesis/Project Title: Blackbox Auditing in NFV and Container Cluster Present Position: PhD Student, Concordia University
2019/9 - 2023/12 Co-Supervisor	Momen Oqaily (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Two Stage Security Auditing for NFV Hosted on 3rd Party Clouds Present Position: PhD Student, Concordia University
2018/9 - 2022/10 Co-Supervisor	Azadeh Tabiban (Completed) , Concordia University Thesis/Project Title: Provenance Analysis in Virtualized Environments Present Position: Postdoctoral Fellow, Ericsson Canada
2018/9 - 2023/8 Co-Supervisor	Ataollah Changizi (In Progress) , Concordia University Student Degree Expected Date: 2023/8 Thesis/Project Title: Distributed Machine Learning for Security Present Position: Ph.D. student, Concordia University
2018/1 - 2022/12 Co-Supervisor	Alaa Oqaily (In Progress) , Concordia University Student Degree Expected Date: 2022/12 Thesis/Project Title: Security Verification for NFV Present Position: Ph.D. student, Concordia University
2016/9 - 2022/12 Co-Supervisor	Onur Duman (In Progress) , Concordia University Student Degree Expected Date: 2022/12 Thesis/Project Title: Smart Grid Security Modeling and Hardening Present Position: Ph.D. student, Concordia University
2015/1 - 2020/12 Principal Supervisor	Meisam Mohamady (Completed) , Concordia University Thesis/Project Title: Novel Approaches to Preserving Utility in Privacy Enhancing Technologies Present Position: Assistant Professor, Iowa State University
2015/1 - 2018/7 Principal Supervisor	Suryadipta Majumdar (Completed) , Concordia University Thesis/Project Title: Proactive Security Auditing for Clouds Present Position: Assistant Professor, Concordia University
2014/9 - 2019/7 Principal Supervisor	Nawaf Alhebaishi (Completed) , Concordia University Thesis/Project Title: Threat Modeling for Cloud and NFV Infrastructures Present Position: Assistant Professor, King Abdulaziz University
2013/9 - 2021/10 Principal Supervisor	Daniel Borbor (Withdrawn) , Concordia University Thesis/Project Title: Network Security Hardening Present Position: Information Security Engineer, Genetec
2013/9 - 2019/1 Co-Supervisor	Paria Shirani (Completed) , Concordia University Thesis/Project Title: Binary Code Fingerprinting with Application to Automated Vulnerability Detection Present Position: Assistant Professor, University of Ottawa

- 2013/9 - 2018/12
Co-Supervisor
Taous Madi (Completed) , Concordia University
Thesis/Project Title: Security Auditing and Multi-Tenancy Threat Evaluation in Public Cloud Infrastructures
Present Position: Research Scientist, King Abdullah University of Science and Technology
- 2013/1 - 2018/4
Co-Supervisor
Saed Alrabaee (Completed) , Concordia University
Thesis/Project Title: Efficient, Scalable, and Accurate Program Fingerprinting in Binary Code
Present Position: Assistant Professor, York University
- 2013/1 - 2018/2
Principal Supervisor
Mengyuan Zhang (Completed) , Concordia University
Thesis/Project Title: Network Security Metrics: Estimating the Resilience of Networks against Zero Day Attacks
Present Position: Research Assistant Professor, Hong Kong Polytechnic University

Post-doctorate [n=1]

- 2022/1 - 2023/12
Principal Supervisor
Mohammad Ekramul Kabir (In Progress) , Concordia University
Student Degree Expected Date: 2023/12
Thesis/Project Title: Proactive Security for 5G Core Container Environments
Present Position: Postdoctoral Fellow, Concordia University

Event Administration

- 2022/11 - 2022/11
PC Co-chair, The 21st Workshop on Privacy in the Electronic Society (WPES 2022), Conference, 2022/11 - 2022/11
- 2019/6 - 2019/6
PC Co-chair, The 1st Workshop on Cloud Security and Privacy (Cloud S&P 2019), Conference, 2019/6 - 2019/6
- 2016/10 - 2016/10
PC Co-Chair, The 9th International Symposium on Foundations & Practice of Security (FPS 2016), Conference, 2016/10 - 2016/10

Editorial Activities

- 2020/10 - 2024/9
Assistant Editor, Computers & Security, Journal
- 2020/1 - 2023/12
Associate Editor, Annals of Telecommunications (ANTE), Journal
- 2019/12 - 2022/12
Associate Editor, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal

Organizational Review Activities

- 2022/9 - 2022/9
PC Member, The 24th International Conference on Information and Communications Security (ICICS 2022)
PC Member
- 2022/9 - 2022/9
PC Member, The 10th IEEE Conference on Communications and Network Security (CNS 2022)
PC Member
- 2022/9 - 2022/9
PC Member, The 27th European Symposium on Research in Computer Security (ESORICS) 2022
PC Member

2022/8 - 2022/8	PC Member, The 19th Annual International Conference on Privacy, Security & Trust (PST2022) PC Member
2022/8 - 2022/8	PC Member, The 4th International Conference on Science of Cyber Security (SciSec 2022) PC Member
2022/7 - 2022/7	PC Member, The 36th Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec 2022) PC Member
2022/7 - 2022/7	PC Member, The 19th International Conference on Security and Cryptography (SECRYPT 2022) PC Member
2022/6 - 2022/6	PC Member, The 37th International Conference on ICT Systems Security and Privacy Protection (SEC 2022) PC Member
2022/5 - 2022/5	PC Member, The 3rd International Workshop on Secure Mobile Cloud Computing (IWSeMC 2022) PC Member
2022/5 - 2022/5	PC Member, The IEEE International Conference on Communications (ICC 2022) PC Member
2009/11 - 2021/11	External Reviewer, Natural Sciences and Engineering Research Council of Canada (NSERC) Grant application review
2021/10 - 2021/10	PC Member, The 9th IEEE Conference on Communications and Network Security (CNS 2021) PC Member
2021/10 - 2021/10	PC Member, The 26th European Symposium on Research in Computer Security (ESORICS 2021) PC Member
2021/9 - 2021/9	PC Member, The 23rd International Conference on Information and Communications Security (ICICS 2021) PC Member
2021/7 - 2021/7	PC Member, The 35th Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec 2021) PC Member
2021/6 - 2021/6	PC Member, The IEEE International Conference on Communications (ICC 2021) PC Member
2021/6 - 2021/6	PC Member, The 37th International Conference on ICT Systems Security and Privacy Protection (SEC 2021) PC Member
2020/12 - 2020/12	PC Member, The 12th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2020) PC Member
2020/9 - 2020/9	PC Member, The 25th European Symposium on Research in Computer Security (ESORICS 2020) PC Member

2020/8 - 2020/8	PC Member, The 22nd International Conference on Information and Communications Security (ICICS 2020) PC Member
2020/7 - 2020/7	PC Member, The 17th International Conference on Security and Cryptography (SECRYPT 2020) PC Member
2020/7 - 2020/7	PC Member, The 34th Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec 2020) PC Member
2020/6 - 2020/6	PC Member, The 8th IEEE Conference on Communications and Network Security (CNS 2020) PC Member
2020/6 - 2020/6	PC Member, The IEEE International Conference on Communications (ICC 2020) PC Member
2020/6 - 2020/6	PC Member, The 18th International Conference on Applied Cryptography and Network Security (ACNS 2020) PC Member
2020/5 - 2020/5	PC Member, The 35th IFIP TC-11 International Information Security and Privacy Conference (SEC 2020) PC Member
2020/5 - 2020/5	PC Member, The First International Workshop on Secure Mobile Cloud Computing (IWSeMC-20) PC Member
2019/12 - 2019/12	PC Member, The 11th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2019) PC Member
2019/12 - 2019/12	PC Member, The 21st International Conference on Information and Communications Security (ICICS 2019) PC Member
2019/12 - 2019/12	PC Member, The 11th International Symposium on Cyberspace Safety and Security (CSS 2019) PC Member
2019/11 - 2019/11	PC Member, The 16th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2019) PC Member
2019/11 - 2019/11	PC Member, The 14th International Conference on Risks and Security of Internet and Systems (CRiSIS 2019) PC Member
2019/11 - 2019/11	PC Member, The 2019 IEEE Conference on Dependable and Secure Computing (DSC 2019) PC Member
2019/9 - 2019/9	PC Member, The 24th European Symposium on Research in Computer Security (ESORICS 2019) PC Member
2019/8 - 2019/8	PC Member, The 2nd International Conference on Science of Cyber Security (SciSec'2019) PC Member

2019/8 - 2019/8	PC Member, The 18th IEEE International Conference on Trust, Security and Privacy in Computing and Communication PC Member
2019/7 - 2019/7	PC Member, The 16th International Conference on Security and Cryptography (SECRYPT 2019) PC Member
2019/7 - 2019/7	PC Member, The 33rd Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy PC Member
2019/7 - 2019/7	PC Member, The IEEE Workshop on Security, Trust and Privacy for Software and Application (STPSA 2019) PC Member
2019/6 - 2019/6	PC Member, The 14th Annual Symposium on Information Assurance (ASIA 2019) PC Member
2019/6 - 2019/6	PC Member, The 34th IFIP TC-11 SEC 2019 International Information Security and Privacy Conference (SEC 2019) PC Member
2019/5 - 2019/5	PC Member, The 2019 IEEE International Conference on Communications (ICC 2019) PC Member
2018/12 - 2018/12	PC Member, The 10th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2018) PC Member
2018/11 - 2018/11	PC Member, The 11th International Symposium on Foundations & Practice of Security (FPS 2018) Paper review
2018/10 - 2018/10	PC Member, The 12th International Conference on Risks and Security of Internet and Systems (CRiSIS 2018) PC Member
2018/9 - 2018/9	PC Member, The 23rd European Symposium on Research in Computer Security (ESORICS 2018) PC Member
2018/7 - 2018/7	PC Member, The 32nd Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy PC Member
2018/7 - 2018/7	PC Member, The International Conference on Security and Cryptography (SECRYPT 2018) PC Member
2016/3 - 2018/7	External Reviewer, The Research Grants Council (RGC) of Hong Kong Grant application review
2018/5 - 2018/6	PC Member, The 4th IEEE Workshop on Security and Privacy in the Cloud (SPC 2018) PC Member
2018/4 - 2018/5	PC Member, IEEE International Conference on Communications (ICC 2018) PC Member
2018/1 - 2018/2	PC Member, The 4th IEEE Conference on Network Softwarization (IEEE NetSoft 2018) PC Member

2017/12 - 2017/12	PC Member, The 13th International Conference on Information Systems Security (ICISS 2017) PC Member
2017/9 - 2017/9	PC Member, The 12th International Conference on Risks and Security of Internet and Systems (CRiSIS 2017) PC Member
2017/8 - 2017/8	PC Member, The Third International Workshop on Graphical Models for Security (GraMSec 2017) PC Member
2017/7 - 2017/7	PC Member, The International Conference on Security and Cryptography (SECRYPT 2017) PC Member
2017/7 - 2017/7	PC Member, The 31st Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy PC Member
2017/5 - 2017/6	PC Member, The 22nd European Symposium on Research in Computer Security (ESORICS 2017) PC Member
2017/5 - 2017/5	PC Member, The IEEE International Conference on Communications (ICC 2017) PC Member
2017/4 - 2017/4	PC Member, The Fifth International Workshop on Security in Cloud Computing (SCC 2017) PC Member
2017/2 - 2017/3	PC Member, The 10th International Symposium on Foundations & Practice of Security (FPS 2017) PC Member
2016/12 - 2016/12	PC Member, The 8th International Symposium on Cyberspace Safety and Security (CSS 2016) PC Member
2016/7 - 2016/7	PC Member, The International Conference on Security and Cryptography (SECRYPT 2016) PC Member
2016/7 - 2016/7	PC Member, The 30th Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy PC Member
2016/6 - 2016/7	PC Member, The Third International Workshop on Graphical Models for Security (GraMSec 2016) PC Member
2016/5 - 2016/6	PC Member, The 31th IFIP TC-11 SEC 2016 International Information Security and Privacy Conference (SEC 2016) PC Member
2016/5 - 2016/5	PC Member, The 1st International Workshop on Authentication Techniques (AuthTech 2016) PC Member

Publications

Journal Articles

1. Suryadipta Majumdar*, Gagandeep Singh Chawla*, Amir Alimohammadifar*, Taous Madi*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang, and Mourad Debbabi. (2022). ProSAS: Proactive Security Auditing System for Clouds. *IEEE Transactions on Dependable and Secure Computing (TDSC)*. 19(4): 2517 - 2534.
Published
Refereed?: Yes
2. Abdullah Qasem, Paria Shirani*, Mourad Debbabi, Lingyu Wang, Bernard Lebel and Basile L. Agba. (2022). Automatic Vulnerability Detection in Embedded Device Firmware and Binary Code: Survey and Layered Taxonomies. *ACM Computing Surveys (CSUR)*. 54(2): 1-42.
Published
Refereed?: Yes
3. Shangyu Xie, Meisam Mohammady*, Han Wang, Lingyu Wang, Jaideep Vaidya and Yuan Hong. (2022). A Generalized Framework for Preserving Both Privacy and Utility in Data Outsourcing. *IEEE Transactions on Knowledge and Data Engineering (TKDE)*.
Accepted
Refereed?: Yes
4. Onur Duman*, Mengyuan Zhang*, Lingyu Wang, Mourad Debbabi, Ribal Atallah, Bernard Lebel. (2022). Factor of Security(FoS): Quantifying the Security Effectiveness of Redundant Smart Grid Subsystems. *IEEE Trans. on Dependable and Secure Computing (TDSC)*. 19(2): 1018-1035.
Published
Refereed?: Yes
5. Gagandeep Singh Chawla*, Mengyuan Zhang, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2021). VMGuard: State-based Proactive Verification of Virtual Network Isolation with Application to NFV. *IEEE Trans. on Dependable and Secure Computing (TDSC)*. 18(4): 1553-1567.
Published
Refereed?: Yes
6. Mengyuan Zhang*, Lingyu Wang, Sushil Jajodia, Anoop Singhal. (2021). Network Attack Surface: Lifting the Concept of Attack Surface to the Network Level for Evaluating Networks' Resilience against Zero-Day Attacks. *IEEE Trans. on Dependable and Secure Computing (TDSC)*. 18(1): 310 - 324.
Published
Refereed?: Yes
7. Meisam Mohammady*, Momen Oqaily*, Lingyu Wang, Yuan Hong, Habib Louafi, Makan Pourzandi and Mourad Debbabi. (2021). A Multi-view Approach to Preserve Both Privacy and Utility in Network Trace Anonymization. *ACM Transactions on Privacy and Security (TOPS)*. 24(3): 14:1-14:36.
Published
Refereed?: Yes
8. Saed Alrabaee*, Mourad Debbabi and Lingyu Wang. (2020). CPA: Accurate Cross-Platform Binary Authorship Characterization Using LDA. *IEEE Trans. on Information Forensics and Security (TIFS)*. 15(1): 3051-3066.
Published
Refereed?: Yes

9. Daniel Borbor*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2019). Optimizing the Network Diversity to Improve the Resilience of Networks Against Unknown Attacks. *Computer Communications*. 145(1): 96-112.
Published
Refereed?: Yes
10. Suryadipta Majumdar*, Azadeh Tabiban*, Yosr Jarraya, Momen Oqaily*, Amir Alimohammadifar*, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Learning Probabilistic Dependencies among Events for Proactive Security Auditing in Clouds. *Journal of Computer Security*. 24(2): 165-202.
Published
Refereed?: Yes
11. Nawaf Alhebaishi*, Lingyu Wang, Sushil Jajodia and Anoop Singhal,. (2019). Mitigating the Insider Threat of Remote Administrators in Clouds through Maintenance Task Assignments. *Journal of Computer Security (JCS)*. 27(4): 427-458.
Published
Refereed?: Yes
12. Saed Alrabaee*, Paria Shirani*, Lingyu Wang, Mourad Debbabi and Aiman Hanna. (2019). Decoupling Coding Habits from Functionality for Effective Binary Authorship Attribution. *Journal of Computer Security (JCS)*. 27(6): 613-648.
Published
Refereed?: Yes
13. Mengyuan Zhang*, Xavier de Carné de Carnavalet, Lingyu Wang, Ahmed Ragab. (2019). Large-Scale Empirical Study of Important Features Indicative of Discovered Vulnerabilities to Assess Application Security. *IEEE Trans. on Information Forensics and Security (TIFS)*. 14(9): 2315 - 2330.
Published
Refereed?: Yes
14. Momen Oqaily*, Yosr Jarraya, Meisam Mohammady*, Suryadipta Majumdar*, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). SegGuard: Segmentation-based Anonymization of Network Data in Clouds for Privacy-Preserving Security Auditing. *IEEE Trans. on Dependable and Secure Computing (TDSC)*. 18(5): 2486–2505.
Published
Refereed?: Yes
15. Saed Alrabaee*, Mourad Debbabi, Lingyu Wang. (2019). On the Feasibility of Binary Authorship Characterization. *Digital Investigation*. 28(Supplement): S3–S11.
Published
Refereed?: Yes
16. Daniel Borbor*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2018). Surviving Unpatchable Vulnerabilities through Heterogeneous Network Hardening Options. *Journal of Computer Security (JCS)*. 26(6): 761-789.
Published
Refereed?: Yes
17. Saed Alrabaee*, Paria Shirani*, Lingyu Wang, Mourad Debbabi. (2018). FOSSIL: A Resilient and Efficient System for Identifying FOSS Functions in Malware Binaries. *ACM Transactions on Privacy and Security (TOPS)*. 21(2): 8:1-8:34.
Published
Refereed?: Yes
18. Alireza Shameli-Sendi, Michel Dagenaisb, Lingyu Wang. (2018). Realtime Intrusion Risk Assessment Model based on Attack and Service Dependency Graphs. *Computer Communications*. 116(1): 253-272.
Published
Refereed?: Yes

19. Suryadipta Majumdar*, Taous Madi*, Yushun Wang*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). User-Level Runtime Security Auditing for the Cloud. *IEEE Transactions on Information Forensics and Security (TIFS)*. 13(5): 1185-1199.
Published
Refereed?: Yes
20. Yuan Hong, Wen Ming Liu*, Lingyu Wang. (2017). Privacy Preserving Smart Meter Streaming against Information Leakage of Appliance Status. *IEEE Transactions on Information Forensics and Security (TIFS)*. 12(9): 2227 - 2241.
Published
Refereed?: Yes
21. Mengyuan Zhang*, Lingyu Wang, Sushil Jajodia, Anoop Singhal, Massimiliano Albanese. (2016). Network Diversity: A Security Metric for Evaluating the Resilience of Networks against Zero-Day Attacks. *IEEE Transactions on Information Forensics and Security (TIFS)*. 11(5): 1071–1086.
Published
Refereed?: Yes
22. Baojiang Cui, Zheli Liu, Lingyu Wang. (2016). Key-Aggregate Searchable Encryption (KASE) for GroupData Sharing via Cloud Storage. *IEEE Transactions on Computers*. 65(8): 2374 - 2385.
Published
Refereed?: Yes
23. Baojiang Cui, Fuwei Wang, Yongle Hao, Lingyu Wang. (2016). A Taint Based Approach for Automatic Reverse Engineering of Gray-box File Formats. *Soft Computing*. 20(9): 3563–3578.
Published
Refereed?: Yes
24. Djedjiga Mouheb*, Dima Alhadidi, Mariam Nouh, Mourad Debbabi, Lingyu Wang, Makan Pourzandi. (2016). Aspect-Oriented Modeling Framework for Security Hardening. *Innovations in Systems and Software Engineering (ISSE)*. 12(1): 41-67.
Published
Refereed?: Yes
25. Saed Alrabaee*, Lingyu Wang, Mourad Debbabi. (2016). BinGold: Towards robust binary analysis by extracting the semantics of binary code as semantic flow graphs (SFGs). *Digital Investigation*. 18(7)
Published
Refereed?: Yes

Books

1. Saed Alrabaee*, Mourad Debbabi, Paria Shirani*, Lingyu Wang, Amr Youssef, Ashkan Rahimian, Lina Nouh, Djedjiga Mouheb, He Huang, Aiman Hanna. (2020). *Binary Code Fingerprinting for Cybersecurity - Application to Malicious Code Fingerprinting*. : 233.
Published, Springer
Refereed?: Yes
2. Suryadipta Majumdar*, Taous Madi*, Yushun Wang*, Azadeh Tabiban*, Momen Oqaily*, Amir Alimohammadifar*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). *Cloud Security Auditing*. : 177.
Published, Springer
Refereed?: Yes
3. Lingyu Wang, Sushil Jajodia, Anoop Singhal (Eds.). (2017). *Network Security Metrics*. : 206.
Published, Springer
Refereed?: Yes

4. Frédéric Cuppens, Lingyu Wang, Nora Cuppens-Boulahia, Nadia Tawbi, Joaquín García-Alfaro (Eds.). (2017). Foundations and Practice of Security (9th International Symposium, FPS 2016, Québec City, QC, Canada, October 24-25, 2016, Revised Selected Papers). : 361.
Published, Springer
Refereed?: No
5. Wen Ming Liu*, Lingyu Wang. (2016). Preserving Privacy against Side-Channel Leaks: From Data Publishing to Web Applications. : 150.
Published, Springer
Refereed?: Yes

Book Chapters

1. Lingyu Wang, Mengyuan Zhang*, Anoop Singhal. (2018). Network Security Metrics: From Known Vulnerabilities to Zero Day Attacks. Pierangela Samarati, Indrajit Ray, Indrakshi Ray. From Database to Cyber Security. : 450–469.
Published, Springer
Refereed?: Yes

Conference Publications

1. Hugo Kermabon-Bobinnec*, Mahmood Gholipourchoubeh*, Sima Bagheri*, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi and Lingyu Wang. (2022). ProSPEC: Proactive Security Policy Enforcement for Containers. Proc. the 12th ACM Conference on Data and Application Security and Privacy (CODASPY 2022) (Acceptance ratio 30/111 \approx 27%),
Paper
Published
Refereed?: Yes, Invited?: No
2. Onur Duman*, Lingyu Wang, Minh Auy, Marthe Kassoufy, Mourad Debbabi. (2022). Hardening Substations against Supply Chain Attacks Under Operational Constraints. Proc. the 13th Conference on Innovative Smart Grid Technologies (ISGT 2022),
Paper
Published
Refereed?: Yes, Invited?: No
3. Azadeh Tabiban*, Heyang Zhao, Yosr Jarraya, Makan Pourzandi, Mengyuan Zhang, Lingyu Wang. (2022). ProvTalk: Towards Interpretable Multi-level Provenance Analysis in Networking Function Virtualization (NFV). Proc. the Network and Distributed System Security Symposium (NDSS 2022) (Acceptance ratio 83/513 \approx 16.2%),
Paper
Published
Refereed?: Yes, Invited?: No
4. Azadeh Tabiban*, Heyang Zhao, Yosr Jarraya, Makan Pourzandi and Lingyu Wang. (2022). VinciDecoder: Automatically Interpreting Provenance Graphs into Textual Forensic Reports with Application to OpenStack. Proc. the 27th Nordic Conference on Secure IT Systems (NordSec 2022) (Acceptance ratio 20/89 \approx 22.5%),
Paper
Published
Refereed?: Yes, Invited?: No

5. Shangyu Xie, Meisam Mohammady*, Han Wang, Lingyu Wang, Jaideep Vaidya and Yuan Hong. (2022). Poster: A Generalized Framework for Preserving Both Privacy and Utility in Data Outsourcing. Proc. the 38th IEEE International Conference on Data Engineering (ICDE 2022),
Poster
Published
Refereed?: Yes, Invited?: No
6. Alaa Oqaily*, Yosr Jarraya, Lingyu Wang, Makan Pourzandi, Suryadipta Majumdar. (2022). MLFM: Machine Learning Meets Formal Method for Efficient Security Verification in Network Functions Virtualization (NFV). Proc. the 27th European Symposium on Research in Computer Security (ESORICS 2022) (Acceptance ratio 104/562≈18.5%),
Paper
Published
Refereed?: Yes, Invited?: No
7. A S M Asadujjaman*, Momen Oqaily*, Yosr Jarraya, Suryadipta Majumdar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2021). Artificial Packet-Pair Dispersion (APPD): A Blackbox Approach to Verifying the Integrity of NFV Service Chains. Proc. the 9th IEEE Conference on Communications and Network Security (CNS 2021) (Acceptance ratio 32/113≈28%),
Paper
Published
Refereed?: Yes, Invited?: No
8. Azadeh Tabiban*, Yosr Jarraya, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2020). Catching Falling Dominoes: Cloud Management-Level Provenance Analysis with Application to OpenStack. Proc. The 8th IEEE Conference on Communications and Network Security (CNS 2020),
Paper
Accepted
Refereed?: Yes, Invited?: No
9. Nawaf Alhebaishi*, Lingyu Wang and Sushil Jajodia. (2020). Modeling and Mitigating Security Threats in Network Functions Virtualization (NFV),". Proc. 34th Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSec 2020),
Paper
Accepted
Refereed?: Yes, Invited?: No
10. Alaa Oqaily*, Sudershan Lakshmanan Thirunavukkarasu*, Yosr Jarraya, Suryadipta Majumdar, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang, Mourad Debbabi. (2020). NFVGuard: Verifying the Security of Multilevel Network Functions Virtualization (NFV) Stack. Proceedings of the 12th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2020),
Paper
Accepted
Refereed?: Yes, Invited?: No
11. Meisam Mohammady*, Shangyu Xie, Yuan Hong, Mengyuan Zhang, Lingyu Wang, Makan Pourzandi and Mourad Debbabi. (2020). R²DP: A Universal and Automated Approach to Optimizing the Randomization Mechanisms of Differential Privacy for Utility Metrics with No Known Optimal Distributions. Proceedings of the 27th ACM Conference on Computer and Communications Security (CCS 2020) (Acceptance ratio 121/715≈16.9%),
Paper
Accepted
Refereed?: Yes, Invited?: No

12. Sudershan Lakshmanan Thirunavukkarasu*, Mengyuan Zhang, Alaa Oqaily*, Gagandeep Singh Chawla*, Lingyu Wang, Makan Pourzandi and Mourad Debbabi. (2019). Modeling NFV Deployment to Identify the Cross-level Inconsistency Vulnerabilities. Proc. The 11th IEEE International Conference and on Cloud Computing Technology and Science (CloudCom 2019),
Paper
Accepted
Refereed?: Yes, Invited?: No
13. Momen Oqaily*, Yosr Jarraya, Mengyuan Zhang*, Lingyu Wang, Makan Pourzandi and Mourad Debbabi. (2019). iCAT: An Interactive Customizable Anonymization Tool. Proc. the 24th European Symposium on Research in Computer Security (ESORICS 2019) (Acceptance ratio 67/344≈19.5%),
Paper
Accepted
Refereed?: Yes, Invited?: No
14. Mengyuan Zhang*, Yue Xin*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2019). CASFinder: Detecting Common Attack Surface. Proc. 33rd Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSec 2019) (Best Paper Award),
Paper
Accepted
Refereed?: Yes, Invited?: No
15. Suryadipta Majumdar*, Azadeh Tabiban*, Meisam Mohammady*, Alaa Oqaily*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Proactivizer: Transforming Existing Verification Tools into Efficient Solutions for Runtime Security Enforcement. Proc. the 24th European Symposium on Research in Computer Security (ESORICS 2019) (Acceptance ratio 67/344≈19.5%),
Paper
Accepted
Refereed?: Yes, Invited?: No
16. Suryadipta Majumdar, Azadeh Tabiban*, Meisam Mohammady*, Alaa Oqaily*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Multi-Level Proactive Security Auditing for Cloud. Proc. the IEEE Conference on Dependable and Secure Computing (DSC 2019),
Paper
Accepted
Refereed?: Yes, Invited?: No
17. Onur Duman*, Mohsen Ghafouri, Marthe Kassouf, Ribal Atallah, Lingyu Wang, Mourad Debbabi. (2019). Modeling Supply Chain Attacks in IEC 61850 Substations. Proc. the 2019 IEEE International Conference on Smart Grid Communications (SmartGridComm 2019),
Paper
Accepted
Refereed?: Yes, Invited?: No
18. Saed Alrabaei*, El Mouatez Karbab, Lingyu Wang and Mourad Debbabi. (2019). BinEye: Towards Efficient Binary Authorship Characterization Using Deep Learning. Proc. the 24th European Symposium on Research in Computer Security (ESORICS 2019) (Acceptance ratio 67/344≈19.5%),
Paper
Accepted
Refereed?: Yes, Invited?: No

19. Taous Madi*, Mengyuan Zhang*, Yosr Jarrayay, Amir Alimohammadifar*, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). QuantiC: Distance Metrics for Evaluating Multi-tenancy Threats in Software Defined Networking (SDN)-Based Cloud. The 10th IEEE International Conference and on Cloud Computing Technology and Science (CloudCom 2018) (Acceptance ratio 18/91≈20%),
Paper
Published
Refereed?: Yes, Invited?: No
20. Amir Alimohammadifar*, Suryadipta Majumdar*, Taous Madi*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). Stealthy Probing-based Verification (SPV): An Active Approach to Defending Software Defined Networks against Topology Poisoning Attacks. the 23rd European Symposium on Research in Computer Security (ESORICS 2018) (Acceptance ratio 56/283≈20%),
Paper
Published
Refereed?: Yes, Invited?: No
21. Paria Shirani*, Leo Collard, Basile L. Agba, Bernard Lebel, Mourad Debbabi, Lingyu Wang, Aiman Hanna. (2018). Scalable Approach to Detecting Vulnerable Functions in Firmware Images of Smart Grid IEDs. the 15th Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA 2018) (Acceptance ratio 18/59≈31%),
Paper
Published
Refereed?: Yes, Invited?: No
22. Azadeh Tabiban*, Suryadipta Majumdar*, Lingyu Wang and Mourad Debbabi. (2018). PERMON: An OpenStack Middleware for Runtime Security Policy Enforcement in Clouds. the 4th IEEE Workshop on Security and Privacy in the Cloud (SPC 2018),
Paper
Published
Refereed?: Yes, Invited?: No
23. Saed Alrabaee*, Paria Shirani*, Lingyu Wang, Mourad Debbabi and Aiman Hanna. (2018). On Leveraging Coding Habits for Effective Binary Authorship Attribution. the 23rd European Symposium on Research in Computer Security (ESORICS 2018) (Acceptance ratio 56/283≈20%),
Paper
Published
Refereed?: Yes, Invited?: No
24. Meisam Mohammady*, Lingyu Wang, Yuan Hong, Habib Louafi, Makan Pourzandi and Mourad Debbabi. (2018). Preserving Both Privacy and Utility in Network Trace Anonymization. the 25th ACM Conference on Computer and Communications Security (CCS 2018) (Acceptance ratio 134/809≈17%),
Paper
Published
Refereed?: Yes, Invited?: No
25. Nawaf Alhebaishi*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2018). Modeling and Mitigating the Insider Threat of Remote Administrators in Clouds. 32nd Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC 2018) (Best Student Paper Award),
Paper
Published
Refereed?: Yes, Invited?: No

26. Onur Duman*, Mengyuan Zhang*, Lingyu Wang, Mourad Debbabi. (2017). Measuring the Security Posture of IEC 61850 Substations with Redundancy Against Zero Day Attacks. IEEE International Conference on Smart Grid Communications (SmartGridComm 2018),
Paper
Published
Refereed?: Yes, Invited?: No
27. Yushun Wang*, Taous Madi*, Suryadipta Majumdar*, Yosr Jarraya, Amir Alimohammadifar*, Makan Pourzandi, Lingyu Wang, Mourad Debbabi. (2017). TenantGuard: Scalable Runtime Verification of Cloud-Wide VM-Level Network Isolation. Proc. The Network and Distributed System Security Symposium (NDSS 2017) (Acceptance ratio 68/423≈16%),
Paper
Published
Refereed?: Yes, Invited?: No
28. Paria Shirani*, Lingyu Wang, Mourad Debbabi. (2017). BinShape: Scalable and Robust Binary Library Function Identification Using Diverse Features. 14th Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA 2017) (Acceptance ratio 18/67≈27%),
Paper
Published
Refereed?: Yes, Invited?: No
29. Suryadipta Majumdar*, Yosr Jarraya, Momen Oqaily*, Amir Alimohammadifar*, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2017). LeaPS: Learning-Based Proactive Security Auditing for Clouds. 22nd European Symposium on Research in Computer Security (ESORICS 2017) (Acceptance ratio 54/340≈16%),
Paper
Published
Refereed?: Yes, Invited?: No
30. Daniel Borbor*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2017). Securing Networks against Unpatchable and Unknown Vulnerabilities Using Heterogeneous Hardening Options. 31st Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC 2017),
Paper
Published
Refereed?: Yes, Invited?: No
31. Saed Alrabaee*, Paria Shirani*, Mourad Debbabi and Lingyu Wang. (2016). On the Feasibility of Malware Authorship Attribution. The 9th International Symposium on Foundations & Practice of Security (FPS 2016),
Paper
Published
Refereed?: Yes, Invited?: No
32. Nawaf Alhebaishi*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2016). Threat Modeling for Cloud Data Center Infrastructures. The 9th International Symposium on Foundations & Practice of Security (FPS 2016),
Paper
Published
Refereed?: Yes, Invited?: No
33. Mickael Emirkanian-Bouchard* and Lingyu Wang. (2016). Towards Metric-Driven, Application-Specific Visualization of Attack Graphs. The 9th International Symposium on Foundations & Practice of Security (FPS 2016),
Paper
Published
Refereed?: Yes, Invited?: No

34. Suryadipta Majumdar*, Yosr Jarraya, Taous Madi, Amir Alimohammadifar*, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2016). Proactive Verification of Security Compliance for Clouds through Pre-Computation: Application to OpenStack. the 21st European Symposium on Research in Computer Security (ESORICS 2016) (Acceptance ratio 60/285≈21%),
Conference Date: 2016/9
Paper
Published
Refereed?: Yes, Invited?: No
35. Daniel Borbor*, Lingyu Wang, Sushil Jajodia and Anoop Singha. (2016). Diversifying Network Services under Cost Constraints for Better Resilience against Unknown Attacks. 30th Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC 2016),
Conference Date: 2016/7
Paper
Published
Refereed?: Yes, Invited?: No
36. Taous Madi*, Suryadipta Majumdar*, Yushun Wang*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2016). Auditing Security Compliance of the Virtualized Infrastructure in the Cloud: Application to OpenStack. The 6th ACM Conference on Data and Application Security and Privacy (CODASPY 2016) (Acceptance ratio 22/115≈19%),
Conference Date: 2016/3
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Patents

1. Data Anonymization Views. United States of America. PCT/IB2020/054045. 2019/04/08.
Patent Status: Pending
Inventors: Momen Oqaily*, Lingyu Wang, Makan Pourzandi, Yosr Jarraya, Mengyuan Zhang, Mourad Debbabi
2. Utility Optimized Differential Privacy System. United States of America. PCT/IB2020/054541. 2019/03/13.
Patent Status: Pending
Inventors: Meisam Mohammady*, Lingyu Wang, Makan Pourzandi, Shangyu Xie, Yuan Hong, Yosr Jarraya, Mengyuan Zhang, Mourad Debbabi,
3. Apparatus and Method for Evaluating Multiple Aspects of The Security for Virtualized Infrastructure in a Cloud Environment. United States of America. PCT/IB2019/053352. 2018/03/29.
Patent Status: Pending
Inventors: Taous Madi*, Lingyu Wang, Makan Pourzandi, Yosr Jarraya, Mengyuan Zhang, Mourad Debbabi
4. Partition-Based Prefix Preserving Anonymization Approach For Network Traces In The Cloud. United States of America. PCT/IB2018/051293. 2018/03/01.
Patent Status: Pending
Inventors: Meisam Mohammady*, Lingyu Wang, Makan Pourzandi, Yosr Jarraya, Mourad Debbabi
5. Privacy-Preserving Data Verification. United States of America. PCT/IB2018/051288. 2018/03/01.
Patent Status: Pending
Inventors: Momen Oqaily*, Lingyu Wang, Makan Pourzandi, Yosr Jarraya, Mourad Debbabi
6. Network Link Verification. United States of America. PCT/IB2018/059632. 2017/10/27.
Patent Status: Pending
Inventors: Amir Alimohammadifar*, Lingyu Wang, Makan Pourzandi, Yosr Jarraya, Mourad Debbabi

7. K-zero Day Safety. United States of America. 8,918,884.
Patent Status: Granted/Issued
Year Issued: 2014
Inventors: Sushil Jajodia, Lingyu Wang, Steven Noel, Anoop Singhal
8. Interactive Analysis of Attack Graphs Using Relational Queries. United States of America. 8,566,269.
Patent Status: Granted/Issued
Year Issued: 2013
Inventors: Sushil Jajodia, Lingyu Wang, Anoop Singhal,



Protected when completed

Date Submitted: 2024-03-04 13:02:21

Confirmation Number: 1755142

Template: NSERC_Researcher

Professor Jun Yan

Correspondence language: English

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Protected when completed

Professor Jun Yan

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
Chinese	Yes	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	Yes	Yes

Degrees

- 2017/8 Doctorate, Electrical Engineering, University of Rhode Island
Supervisors: Haibo He, 2013/9 - 2017/8
- 2013/5 Master's Thesis, Electrical Engineering, University of Rhode Island
Supervisors: Haibo He, 2011/9 - 2013/5
- 2011/6 Bachelor's, Information and Communication Engineering, Zhejiang University
Supervisors: Zhiyu Xiang, 2011/2 - 2011/6

Recognitions

- 2018/5 Excellence in Doctoral Research Award - 1,000
University of Rhode Island
Prize / Award
I was the sole recipient of this award in 2018, which recognizes the excellence of dissertation research among doctoral graduates across every discipline this year.
- 2017/1 Best Reviewers
IEEE Transactions on Smart Grid
Citation
I was selected as one of the 49 Best Reviewers in 2016 for IEEE Transactions on Smart Grid

User Profile

Research Specialization Keywords: Security and resiliency, Situational awareness, Smart grids, Vulnerability assessment, Applied computational intelligence, Cyber-physical security, Fault diagnosis, Machine learning, Microgrids, Renewable energy management, Adaptive control, Risk assessment, Smart cities

Employment

2023/7	<p>Concordia University Research Chair (Tier II) in Artificial Intelligence in Cyber Security and Resilience Concordia Institute for Information Systems Engineering, Concordia University Full-time, Associate Professor Tenure Status: Tenure Conducting research on artificial intelligence as tools, targets, and threats in cyber security and resiliency.</p>
2023/7	<p>Graduate Program Director (Thesis-Based) Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science, Concordia University Full-time, Associate Professor Tenure Status: Tenure Directing the thesis-based graduate program for Master's and Doctoral students.</p>
2022/6	<p>Associate Professor Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science, Concordia University Full-time, Associate Professor Tenure Status: Tenure (After early promotion) Performing research, teaching, and service with the area of expertise in smart grid security, cyber-physical systems, smart infrastructures and intelligent systems.</p>
2017/12 - 2022/5	<p>Assistant Professor Concordia Institute for Information Systems Engineering, Faculty of Engineering and Computer Science, Concordia University Full-time, Assistant Professor Tenure Status: Tenure Track Performing research, teaching, and service with the area of expertise in smart grid security, cyber-physical systems, smart infrastructures and intelligent systems.</p>
2016/1 - 2017/12	<p>Assistant to the Editor-in-Chief Editorial Office, IEEE Transactions on Neural Networks and Learning Systems Part-time Tenure Status: Non Tenure Track In charge of manuscript management, email communication, event coordination, and other administrative responsibilities.</p>

Research Funding History

Awarded [n=7]

2023/6 - 2028/5 Principal Investigator	<p>Concordia University Research Chair (Tier II) in Artificial Intelligence in Cyber Security and Resilience, Research Chair</p> <p>Funding Sources: Concordia University Concordia University Research Chair Total Funding - 160,000 Portion of Funding Received - 160,000 Funding Competitive?: Yes</p>
2023/9 - 2026/8 Co-investigator	<p>Evidence-based monitoring of construction projects through effective, reliable, and credible RFI analysis and management, Grant</p>

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 NSERC Alliance-Mitacs Accelerate
 Total Funding - 484,000
 Portion of Funding Received - 220,000
 Funding Competitive?: Yes
 CREO Solutions
 NSERC Alliance-Mitacs Accelerate
 Total Funding - 411,675
 Portion of Funding Received - 180,000
 Funding Competitive?: Yes
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 NSERC Alliance-Mitacs Accelerate
 Total Funding - 823,350
 Portion of Funding Received - 184,000
 Funding Competitive?: Yes

Co-investigator : Hua Ge; Mazdak Nik-Bakht;

Principal Investigator : Yong Zeng

2024/1 - 2025/12
 Principal Investigator Global Centers Track 2: Equitable and User-Centric Energy Market for Resilient Grid-interactive Communities, Grant

Funding Sources:

National Science Foundation (USA)
 Global Centers
 Total Funding - 250,000
 Portion of Funding Received - 0
 Funding Competitive?: Yes

Co-investigator : Hohyun Lee; Mohsen Ghafouri; Yi Fang;

Principal Investigator : Yuhong Liu

2020/12 - 2025/12
 Co-investigator Toward Intelligent and Resilient Smart Cities with Energy-Vehicle-Human Interactions, Grant

Funding Sources:

Canada Foundation for Innovation (CFI)
 CFI Innovation Fund
 Total Funding - 723,417
 Portion of Funding Received - 341,646
 Funding Competitive?: Yes
 Concordia University and Other Partners
 CFI Innovation Fund (Other Matching)
 Total Funding - 361,709
 Portion of Funding Received - 170,823
 Funding Competitive?: Yes
 Government of Quebec
 CFI Innovation Fund (Provincial Matching)
 Total Funding - 723,417
 Portion of Funding Received - 341,646
 Funding Competitive?: Yes

Co-investigator : Arash Mohammadi; Mohsen Ghafouri; Mourad Debbabi; Walter Lucia;

Principal Investigator : Chadi Assi

2018/4 - 2024/3
 Cyber-Physical Security for Critical Internet-of-Things Infrastructures, Grant

Principal Investigator	Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Total Funding - 180,500 Portion of Funding Received - 180,500 Funding Competitive?: Yes
2023/5 - 2023/11 Co-investigator	From meal planning to grocery shopping cart; a smart software platform combining personalized recommendations, grocery shopping, and healthy-eating-behavior building, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Mitacs Accelerate Total Funding - 30,000 Portion of Funding Received - 10,000 Funding Competitive?: No 7dish Mitacs Accelerate Total Funding - 30,000 Portion of Funding Received - 10,000 Funding Competitive?: No Co-investigator : Yong Zeng; Principal Investigator : Chun Wang
2020/7 - 2023/6 Co-investigator	AI+ Gestion des déchets et des ressources pour une ville durable, Grant Funding Sources: Fonds de recherche du Québec - Société et culture (FRQSC) NSFC - FRQSC – Programme de recherche sur les villes intelligentes et les mégadonnées Total Funding - 120,000 Portion of Funding Received - 45,000 Funding Competitive?: Yes National Natural Science Foundation of China (NSFC) NSFC - FRQSC – Programme de recherche sur les villes intelligentes et les mégadonnées Total Funding - 2,000,000 Portion of Funding Received - 0 Funding Competitive?: Yes Co-applicant : Nadia Bhuiyan; Principal Investigator : Yong Zeng
Completed [n=13]	
2020/1 - 2023/8 Principal Investigator	Intelligent Cyber-Physical Situational Awareness for Smart Infrastructures, Grant Funding Sources: Ericsson Communication Inc. Total Funding - 84,000 Portion of Funding Received - 84,000 Funding Competitive?: Yes Mathematics of Information Technology and Complex Systems (MITACS) Total Funding - 102,666 Portion of Funding Received - 102,666 Funding Competitive?: Yes
2020/1 - 2022/12	Self-Adaptive Penetration Tests with Deep-Reinforced Intelligent Agents, Grant

Principal Applicant	<p>Funding Sources: Ericsson Communication Inc. Total Funding - 42,000 Portion of Funding Received - 42,000 Funding Competitive?: Yes Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Cluster Total Funding - 51,333 Portion of Funding Received - 51,333 Funding Competitive?: Yes</p>
2022/5 - 2022/10 Principal Investigator	<p>Deep Learning for Cyber-Physical System Security in A Smarter World, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Total Funding - 30,000 Portion of Funding Received - 30,000 Funding Competitive?: Yes</p>
2020/1 - 2021/11 Principal Applicant	<p>Transparent and Trustworthy Deep Feature Learning for Cyber-Physical System Security, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Cluster Total Funding - 29,333 Portion of Funding Received - 29,333 Funding Competitive?: Yes Ericsson Communication Inc. Total Funding - 24,000 Portion of Funding Received - 24,000 Funding Competitive?: Yes</p>
2018/9 - 2020/8 Co-investigator	<p>Proactive Security for Attack-Resilient Microgrids: Detection, Mitigation and Recovery, Grant</p> <p>Funding Sources: Concordia University Horizon Postdoctoral Fellowships Total Funding - 95,000 Portion of Funding Received - 95,000 Funding Competitive?: Yes</p> <p>Principal Investigator : Mourad Debbabi</p>
2017/12 - 2020/4 Principal Investigator	<p>Spatial-Temporal Analytics for Data-Intensive Situational Awareness in Smart Grids, Grant</p> <p>Funding Sources: Concordia University Start-Up Grant Total Funding - 50,000 Portion of Funding Received - 50,000 Funding Competitive?: No</p>
2018/4 - 2020/3 Principal Investigator	<p>Feature Learning for Automatic and Adaptive Security of Smart Grid, Grant</p> <p>Funding Sources: Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) Établissement de nouveaux chercheurs universitaires Total Funding - 50,800</p>

- Portion of Funding Received - 50,800
Funding Competitive?: Yes
- 2018/10 - 2019/9
Principal Investigator Aid to the 11th International Symposium on Foundations & Practices of Security (FPS 2018), Grant
- Funding Sources:**
Concordia University
Aid to Research- Related Events
Total Funding - 7,500
Portion of Funding Received - 7,500
Funding Competitive?: Yes
- Co-investigator : Mourad Debbabi
- 2018/12 - 2019/8
Principal Investigator Deep Learning for Cyber-Physical Security in the Smarter World, Grant
- Funding Sources:**
Mathematics of Information Technology and Complex Systems (MITACS)
Globalink Research Internship
Total Funding - 30,000
Portion of Funding Received - 30,000
Funding Competitive?: Yes
- 2018/4 - 2019/4
Principal Investigator Spatial-Temporal Analytics for Data-Intensive Situational Awareness in Smart Grids, Grant
- Funding Sources:**
Nvidia
GPU Grant
Total Funding - 1,500
Portion of Funding Received - 1,500
Funding Competitive?: Yes
- 2018/3 - 2019/3
Co-investigator STARTBASE-I: Integrated Smart Microgrids and Autonomous Vehicles Research TestBed for Smart Connected Communities, Grant
- Funding Sources:**
Concordia University
ENCS - Capital Research Innovation Funds
Total Funding - 100,000
Portion of Funding Received - 57,725
Funding Competitive?: Yes
- Principal Investigator : Arash Mohammadi
- 2018/3 - 2019/3
Co-investigator Intelligent Control, Diagnosis, and Security of Smart Grid Networks, Grant
- Funding Sources:**
Concordia University
ENCS - Capital Research Innovation Funds
Total Funding - 100,000
Portion of Funding Received - 3,300
Funding Competitive?: Yes
- Principal Investigator : Kash Khorasani
- 2016/12 - 2017/6
Principal Investigator Towards a Resilient Smart Grid against Informed False Data Injection Attacks, Grant
- Funding Sources:**
University of Rhode Island (URI)
Enhancement of Graduate Research Award
Total Funding - 670
Portion of Funding Received - 670

Funding Competitive?: Yes

Student/Postdoctoral Supervision

Bachelor's [n=9]

2023/5 - 2023/8 Principal Supervisor	Dohva, Anna (Completed) , V. N. Karazin Kharkiv National University (Ukraine) Thesis/Project Title: Social impact of AI in security management and policy (Mitacs Globalink Research Intern) Present Position: Graduate Student, Swiss Federal Institute of Technology
2023/5 - 2023/8 Principal Supervisor	Sanchez, Héctor (Completed) , Universidad Veracruzana (Mexico) Thesis/Project Title: Security of deep learning applications in industrial IoT (Mitacs Globalink Research Intern) Present Position: Student, Universidad Veracruzana (Mexico)
2023/2 - 2023/8 Principal Supervisor	Benoit, Ludjina (Completed) , Concordia University Thesis/Project Title: VINCheck: Vulnerable Inconsistencies in Developing Free Open-Source Software for Machine Learning (NSERC USRA Intern) Present Position: Student, Concordia University
2023/2 - 2023/8 Principal Supervisor	Darabi, Mohammad-Hossien (Completed) , Concordia University Thesis/Project Title: iScope: A Self-Adaptive Network Telescope to Monitor Unsolicited IoT Connections in the Wild (NSERC USRA Intern) Present Position: Student, Concordia University
2022/5 - 2022/11 Principal Supervisor	Qiao, Mohan (Completed) , McGill University Thesis/Project Title: Industrial IoT security testbed and dataset development Present Position: Research assistant, Concordia University
2022/5 - 2022/8 Principal Supervisor	Singhal, Rishi (Completed) , Indraprastha Institute of Information Technology - Delhi (India) Thesis/Project Title: Automating intrusion detection in critical infrastructures (Mitacs Globalink Research Intern) Present Position: MSc student, North Carolina State University (USA)
2022/5 - 2022/8 Principal Supervisor	Tang, Zixin (Completed) , Nanjing University of Posts and Telecommunications (China) Thesis/Project Title: Graph neural network for industrial IoT anomaly detection (Mitacs Globalink Research Intern) Present Position: Student, ShanghaiTech University (China)
2019/5 - 2019/8 Principal Supervisor	Tan, Jieyuan (Completed) , Zhejiang University (China) Thesis/Project Title: Reinforcement learning in security automation Present Position: PhD student, Hong Kong University of Science and Technology (China)
2019/5 - 2019/8 Principal Supervisor	Kluban, Maryna (Completed) , Taras Shevchenko National University of Kyiv (Ukraine) Thesis/Project Title: Autoencoder techniques for intrusion detection (Mitacs Globalink Research Intern) Present Position: MASc student, Concordia University

Master's Equivalent [n=1]

2019/8 - 2019/8 Principal Supervisor	Yao, Jinli (Completed) , Shandong University of Finance and Economics (China) Thesis/Project Title: Explaining AI-generated decisions in security monitoring Present Position: PhD student, Concordia University
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Master's Thesis [n=12]

- 2023/5 - 2025/4
Co-Supervisor Prithviraj Savant, Shreya (In Progress) , Concordia University
Thesis/Project Title: From meal planning to grocery shopping cart; a smart software platform combining personalized recommendations, grocery shopping, and healthy-eating-behavior
Present Position: Student, Concordia University
- 2023/5 - 2025/4
Co-Supervisor Kumar Rengarajan, Nanda (In Progress) , Concordia University
Thesis/Project Title: From meal planning to grocery shopping cart; a smart software platform combining personalized recommendations, grocery shopping, and healthy-eating-behavior
Present Position: Student, Concordia University
- 2023/1 - 2024/12
Principal Supervisor Dai, Hanzheng (In Progress) , Concordia University
Thesis/Project Title: Applied Machine Learning for Cyber-Physical Security of the Smart Grid
Present Position: Student
- 2023/1 - 2024/12
Principal Supervisor Pasha Shabanfar, Mohammad (In Progress) , Concordia University
Thesis/Project Title: Attack Modelling and Data Synthesis for Applied Artificial Intelligence in Cyber-Physical Security of Smart Grids
Present Position: Student
- 2022/9 - 2024/8
Principal Supervisor Ahmadasab, Sareh (In Progress) , Concordia University
Thesis/Project Title: Intelligent root cause analysis, critical anomaly prediction and digital evidence representation for project management
Present Position: Student
- 2021/6 - 2023/5
Principal Supervisor Frandon, Jeremy (Completed) , Concordia University
Thesis/Project Title: Intelligent Cyber-Physical Situational Awareness for Smart Infrastructures
Present Position: PhD Student, Concordia University
- 2021/1 - 2023/5
Co-Supervisor Li, Shun (Completed) , Concordia University
Thesis/Project Title: UAV-based Forest Wildfire Detection and Monitoring
Present Position: Student, Chinese Academy of Science
- 2020/1 - 2022/12
Principal Supervisor Liao, Pengyi (Completed) , Concordia University
Thesis/Project Title: A Transfer Learning Framework for Self-Adaptive Intrusion Detection in the Smart Grid based on Transferability Analysis and Domain-Adversarial Training
Present Position: Associate Researcher, Huawei Technologies (Canada)
- 2019/5 - 2020/12
Principal Supervisor Varo, Quentin (Completed) , Concordia University
Thesis/Project Title: Dynamic Reduced-Round TLS Extension for Secure Wireless Communication of IoT Devices
Present Position: Chief Information Security Officer, Pineappli, Monaco
- 2019/5 - 2020/12
Principal Supervisor Lardier, William (Completed) , Concordia University
Thesis/Project Title: ASGARDS-H: Enabling Advanced Smart Grid cyber-physical Attacks, Risk and Data Studies with HELICS
Present Position: Software Engineer, Scalify, France
- 2019/1 - 2020/12
Principal Supervisor Zhang, Yongxuan (Completed) , Concordia University
Thesis/Project Title: Domain Adversarial Transfer Learning for Robust Cyber-Physical Attack Detection in the Smart Grid
Present Position: Software Development Engineer, Google (Canada)

2018/1 - 2019/8
Principal Supervisor
Hu, Chengming (Completed) , Concordia University
Thesis/Project Title: Ensemble Feature Learning-Based Event Classification for Cyber-Physical Security of the Smart Grid
Present Position: PhD Student, McGill University

Doctorate [n=11]

2023/9 - 2027/8
Co-Supervisor
Haghjoo, Yasaman (In Progress) , Concordia University
Thesis/Project Title: Secure and Resilient Electricity Market Operations in the Internet of Energy
Present Position: Student

2023/6 - 2027/5
Co-Supervisor
Frandon, Jeremy (In Progress) , Concordia University
Thesis/Project Title: Advanced cyber security analysis and threat hunting
Present Position: Student

2023/5 - 2027/4
Academic Advisor
Lubbos, Fadel (In Progress) , Concordia University
Thesis/Project Title: Secure cloud architecture for next generation operational technologies in grid-interactive communities
Present Position: Student

2022/10 - 2026/12
Principal Supervisor
Al Shami, Maryam (In Progress) , Concordia University
Thesis/Project Title: Critical anomaly detection with visual-causal and data-driven analysis for industrial systems and processes
Present Position: Student

2021/9 - 2025/8
Co-Supervisor
Jafarpour, Hamed (In Progress) , Concordia University
Thesis/Project Title: Computational linguistics for AI-aided adverse event detection and diagnosis
Present Position: Student

2020/1 - 2024/5
Principal Supervisor
Du, Hang (In Progress) , Concordia University
Thesis/Project Title: Cyber-Physical Security for Renewable Energy Systems in the Smart Grid
Present Position: Student

2020/1 - 2024/5
Principal Supervisor
Chen, Juanwei (In Progress) , Concordia University
Thesis/Project Title: Cyber-Physical Security for Distributed Energy Resource Systems and Virtual Power Plants in the Smart Grid
Present Position: Student

2019/9 - 2024/8
Co-Supervisor
Hu, Chengming (In Progress) , McGill University
Thesis/Project Title: Self-Adaptive Intrusion Detection for Dynamic Cyber-Physical Systems
Present Position: Student

2019/9 - 2023/12
Principal Supervisor
Li, Yuanliang (In Progress) , Concordia University
Thesis/Project Title: Self-Adaptive Penetration Testing for Cyber-Physical Systems in the Smart Grid
Present Position: Student

2018/10 - 2020/11
Co-Supervisor
Hou, Luyang (Completed) , Concordia University
Thesis/Project Title: Advanced Mechanism Design for Electric Vehicle Charging Scheduling in the Smart Infrastructure
Present Position: Research Associate Professor, Beijing University of Posts and Telecommunications (China)

2018/9 - 2023/8
Principal Supervisor Rahman, Moshfeka (In Progress) , Concordia University
Thesis/Project Title: Applied Artificial Intelligence for Smart Grid Security: Vulnerabilities, Attacks and Defense
Present Position: Student

Post-doctorate [n=4]

2022/1 - 2022/12
Principal Supervisor Hou, Luyang (Completed) , Concordia University
Thesis/Project Title: Transactive energy with packetized energy and blockchains
Present Position: Research Associate Professor, Beijing University of Posts and Telecommunications (China)

2021/3 - 2023/5
Co-Supervisor Soeanu, Andrei (In Progress) , Concordia University
Thesis/Project Title: Proactive Security for Attack-Resilient Microgrids and Automated Threat Intelligence
Present Position: Post-doctoral fellow, Concordia University

2018/9 - 2019/8
Co-Supervisor Ghafouri, Mohsen (Completed) , Concordia University
Thesis/Project Title: Proactive Security for Attack-Resilient Microgrids: Detection, Mitigation and Recovery
Present Position: Assistant Professor, Concordia University

2018/8 - 2019/7
Principal Supervisor Li, Zhenxing (Completed) , Linyi University (China)
Thesis/Project Title: Multi-agent system-based control for smart grid
Present Position: Professor, Linyi University

Event Administration

2023/2 - 2023/10
Local Organization Chair, 7th IEEE Cyber Security in Networking Conference, Conference, 2023/10 - 2023/10

2019/9 - 2020/8
Technical Program Chair, 2020 IEEE Power and Energy Society General Meeting (PESGM 2020), Conference, 2020/8 - 2020/8

2019/1 - 2019/4
Local Organization Chair, 2019 Cyber-Physical Systems and Internet-of-Things Week, Conference, 2019/4 - 2019/4

2018/8 - 2018/11
Local Organization Chair, The 11th International Symposium on Foundations & Practice of Security (FPS 2018), Conference, 2018/11 - 2018/11

Editorial Activities

2022/8 - 2023/7
Associate Editor, Complex & Intelligent Systems (Springer), Journal

2022/5 - 2023/4
Associate Editor, IET Energy Conversion and Economics, Journal

2016/1 - 2018/6
Assistant to the Editor-in-Chief, IEEE Transactions on Neural Networks and Learning Systems, Journal

Knowledge and Technology Translation

2019/12 - 2023/5 Inventor, R&D Collaboration with Industry
 Group/Organization/Business Serviced: Ericsson Global AI Accelerator (GAIA)
 Target Stakeholder: Industry/Business (>500 employees)
 Outcome / Deliverable: 5 research articles (2 journal, 2 conference and 1 submitted), 3 MASc thesis, and 2 patents (1 pending and 1 being prepared).
 Activity Description: Joint R&D in three Mitacs Accelerate projects of 25 internship units over 3 years (value: CAD 333,333) with Ericsson GAIA Montreal.

International Collaboration Activities

2022/8 - 2023/8 Co-investigator, United States of America
 Joint recipient of the IEEE Blockchain-Enabled Transactive Energy (BCTE) Demonstration project on Demonstration of A Blockchain-Facilitated Packetized Energy Trading Market. An open-source co-simulation platform has been developed jointly from the project with Santa Clara University, USA. It provided a platform for a joint proposal for the NSF-NSERC Global Center awarded to both SCU and Concordia in August 2023.

2020/7 - 2023/6 Co-Principal Investigator, China
 Quebec co-lead of the project "AI+ Gestion des déchets et des ressources pour une ville durable" sponsored by the National Natural Science Foundation of China (NSFC) - Fonds de recherche du Québec – Société et culture (FRQSC) Research Program on Smart Cities and Big Data. Responsible of data analysis for policy evaluation and recommendation in urban solid waste management for sustainable smart cities.

Committee Memberships

2019/3 Committee Member, 2019 International Conference on High Performance Big Data and Intelligent Systems, IEEE Computer Society
 Serving as the TPC member for the conference technically co-sponsored by IEEE Computer Society

2018/10 Committee Member, 2019 IEEE Congress on Evolutionary Computation (CEC), IEEE Computational Intelligence Society
 Serving as the TPC member for the Special Session on Computational Intelligence for Cybersecurity

Presentations

1. (2023). Applied Artificial Intelligence for Smart Grid Security. Invited Seminar at Monash University, Melbourne, VIC, Australia
 Main Audience: Researcher
 Invited?: Yes, Keynote?: No
2. (2023). The Role of Artificial Intelligence in Smart Grid Security. Invited Seminar at Clarkson University, Potsdam, NY, United States of America
 Invited?: Yes, Keynote?: No
3. (2023). AI-based Smart Technologies in Smart Grid Security. Invited Virtual Seminar at the University of Delaware, United States of America
 Invited?: Yes, Keynote?: No

4. (2022). Machine Learning for Secure and Resilient Cyber-Physical Systems: Lessons Learned and Solutions Ahead from the Smart Grid. Ericsson Global AI Accelerator (GAIA) Thursday Invited Talk Series, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
5. (2022). Applied Machine Learning for Smart Grids Through the Lens of Security and Resiliency. Workshop on cyber-physical security of the smart grid, Cozenza, Italy
Main Audience: Researcher
Invited?: Yes, Keynote?: No
6. (2021). Computing Security, Trust and Privacy in a Hyperconnected World. APSIPA U.S. Local Chapter Panel 2021, Kingston, United States of America
Invited?: Yes, Keynote?: No
7. (2020). Cybersecurity in Grid Modernization: Opportunities and Challenges for Machine Learning. IEEE Power and Energy Society (PES) General Meeting, Montreal, Canada
Invited?: No, Keynote?: No
8. (2019). Demand Aware Deployment and Expansion Method for an Electric Vehicles Fast Charging Network. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Main Audience: Researcher
Invited?: No, Keynote?: No
9. (2019). Quantum-Sim: An Open-Source Co-Simulation Platform for Quantum Key Distribution-Based Smart Grid Communications. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Main Audience: Researcher
Invited?: No, Keynote?: No
10. (2019). Domain-Adversarial Transfer Learning for Robust Intrusion Detection in the Smart Grid. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Main Audience: Researcher
Invited?: No, Keynote?: No
11. (2018). Deep Learning-Aided Cyber-Attack Detection in Power Transmission Systems. IEEE Power and Energy Society (PES) General Meeting, Portland, United States of America
Main Audience: Knowledge User
Invited?: No, Keynote?: No

Text Interviews

- | | |
|------------|--|
| 2024/01/24 | Offshore wind farms are vulnerable to cyberattacks, new Concordia study shows, Concordia News: https://www.concordia.ca/news/stories/2024/01/24/offshore-wind-farms-are-vulnerable-to-cyberattacks-new-concordia-study-shows.html |
| 2022/11/30 | Smart inverters' vulnerability to cyberattacks needs to be identified and countered, according to Concordia researchers, Concordia News: https://www.concordia.ca/news/stories/2022/11/29/smart-inverters-vulnerability-to-cyberattacks-needs-to-be-identified-and-counteracted-according-to-concordia-researchers.html |
| 2018/06/20 | Engineering Student Wins URI Excellence in Doctoral Research Award, URI College of Engineering Website |

Publications

Journal Articles

1. Du, H*; Yan, J; Ghafouri, M; Zgheib, R; Debbabi, M. (2024). Modeling and Assessment of Cyber Attacks Targeting Converter-Driven Stability of Power Grids with PMSG-Based Wind Farms. IEEE Transactions on Power Systems.
In Press
Refereed?: Yes
2. Mu, C; Liu, Z; Yan, J; Jia, H, Zhang, X. (2024). Graph Multi-Agent Reinforcement Learning for Inverter-Based Active Voltage Control. IEEE Transactions on Smart Grid. 15(2): 1399-1409.
Published
Refereed?: Yes
3. Rahman, M*; Yan, J; Thepie-Fapi, E. (2024). Adversarial Artificial Intelligence in Blind False Data Injection in Smart Grid AC State Estimation. IEEE Transactions on Industrial Informatics.
In Press
Refereed?: Yes
4. Cheng, G*; Lin, Y; Yan, J; Zhao, J; Bai, L. (2023). Model-Measurement Data Integrity Attacks. IEEE Transactions on Smart Grid. 14(6): 4741 - 4757.
Published
Refereed?: Yes
5. Li, Y*; Yan, J; Naili, M. (2023). Penetration Testing of Cyber-Physical Attacks in Smart Grids Based on Partially Observable Markov Decision Process. IEEE Transactions on Transactions on Dependable and Secure Computing.
Submitted
Refereed?: Yes
6. Hu, C*; Yan, J; Liu, X. (2023). Reinforcement Learning-Based Adaptive Feature Boosting for Smart Grid Intrusion Detection. IEEE Transactions on Smart Grid. 14(4): 3150-3163.
Published
Refereed?: Yes
7. Hou, L; Li, Y*; Yan, J; Liu, Y; Ghafouri, M; Wang, L; Zhang, P. (2023). A Novel Iterative Double Auction Design and Simulation Platform for Packetized Energy Trading of Prosumers in A Residential Microgrid. Energy Conversion and Economics.
Revision Requested
Refereed?: Yes
8. Han X; Mu, C; Yan, J; Niu, Z. (2023). An Autonomous Control Technology Based on Deep Reinforcement Learning for Optimal Active Power Dispatch. International Journal of Electrical Power & Energy Systems. 145: 108686.
Published
Refereed?: Yes
9. Zadsar, M*; Abazari, A*; Ameli, A; Yan, J; Ghafouri, M. (2023). Prevention and Detection of Coordinated False Data Injection Attacks on Integrated Power and Gas Systems. IEEE Transactions on Power Systems. 38(5): 4252-4268.
Published
Refereed?: Yes
10. Li, Y*; Yan, J. (2023). Cybersecurity of Smart Inverters in the Smart Grid: A Survey. IEEE Transactions on Power Electronics. 38(2): 2364-2383.
Published
Refereed?: Yes

11. Ge, L; Liu, H; Yan, J; Sun, B; Li, Y; Hou, L. (2023). A Novel Distributed PV Data Virtual Collection with Continuous-Binary Denoising Auto-Encoders. *IEEE Transactions on Smart Grid*. 15(1): 1152-1164.
Published
Refereed?: Yes
12. Hou, L*; Li, Y*; Yan, J; Wang, C; Wang, L; Wang, B. (2023). Multi-agent reinforcement mechanism design for dynamic pricing-based demand response in charging network. *International Journal of Electrical Power and Energy Systems*. 147
Published
Refereed?: Yes
13. Ge, L; Liu, Y; Yan, J; Li, Y; Zhang, J. (2022). A Virtual Data Collection Model of Distributed PVs considering Spatio-Temporal Coupling and Affine Optimization Reference. *IEEE Transactions on Power Systems*. 38(4): 3939-3951.
Published
Refereed?: Yes
14. Li, Z*; Yan, J; Yu, W; Qiu, J. (2022). Adaptive Event-Triggered Control for Unknown Second-Order Nonlinear Multi-agent Systems. *IEEE Transactions on Cybernetics*. 51(12): 6131-6140.
Published
Refereed?: Yes
15. Hou, L*; Yan, J; Wang, C; Ge, L. (2022). A Simultaneous Multi-Round Auction Design for Scheduling Multiple Charges of Battery Electric Vehicles on Highways. *IEEE Transactions on Intelligent Transportation Systems*. 23(7): 8024-8036.
Published
Refereed?: Yes
16. Chen, T*; Li, S; Yan, J. (2022). CS-RNN: Efficient Training of Recurrent Neural Networks with Continuous Skips. *Neural Computing and Applications*. 34(19): 16515–16532.
Published
Refereed?: Yes
17. Liao, P*; Yan, J; Sellier, JM; Zhang, Y. (2022). Divergence-based Transferability Analysis for Self-Adaptive Smart Grid Intrusion Detection with Transfer Learning. *IEEE Access*. 10: 68807-68818.
Published
Refereed?: Yes, Open Access?: Yes
18. Hou, L*; Wang, C; Yan, J. (2022). An Incentive-Compatible Combinatorial Auction Design for Charging Network Scheduling of Battery Electric Vehicles. *Journal of Integrated Design and Process Science*. 24(2): 75-92.
Published
Refereed?: Yes
19. Cheng, G; Lin, Y; Zhao, J; Yan, J. (2022). A Highly Discriminative Detector against False Data Injection Attacks in AC State Estimation. *IEEE Transactions on Smart Grid*. 13(3): 2318-2330.
Published
Refereed?: Yes
20. Ge L, Liu H, Yan J, Zhu X, Zhang S, Li Y. (2022). Integrated Energy System Optimal Planning Considering Both Carbon Emissions Charging and DG Indeterminate Affine Model. *IEEE Transactions on Sustainable Energy*. 13(2): 905-918.
Published
Refereed?: Yes
21. Ge, L; Li, Y*; Li, Y*; Yan, J; Sun, Y. (2022). Smart Distribution Network Situation Awareness for High-Quality Operation and Maintenance: A Brief Review. *Energies*. 15(3): 828.
Published
Refereed?: Yes, Open Access?: Yes

22. Wang, D; Cheng, L; Yan, J. (2022). Self-Learning Robust Control Synthesis and Trajectory Tracking of Uncertain Dynamics. *IEEE Transactions on Cybernetics*. 52(1): 278-286.
Published
Refereed?: Yes
23. Zhang, M; Wu, Z; Yan, J; Lu, R; Guan, X. (2022). Attack-Resilient Optimal PMU Placement via Reinforcement Learning Guided Tree Search in Smart Grids. *IEEE Transactions on Information Forensics and Security*. 17: 1919-1929.
Published
Refereed?: Yes
24. Liao, P*; Yan, J; Sellier, JM; Zhang, Y*. (2022). TADA: A Transferable Domain-Adversarial Training for Smart Grid Intrusion Detection based on Ensemble Divergence Metrics and Spatiotemporal Features. *Energies*. 15(23): 8778.
Published
Refereed?: Yes, Open Access?: Yes
25. Ge, L; Liu, J; Yan, J; Umer Rafiq, M. (2022). Improved Harris Hawks Optimization for Configuration of PV Intelligent Edge Terminals. *IEEE Transactions on Sustainable Computing*. 7(3): 631-643.
Published
Refereed?: Yes
26. Varo, Q*; Lardier, W*; Yan, J. (2022). Dynamic Reduced-Round TLS Extension for Secure and Energy-Saving Communication of IoT Devices. *IEEE Internet of Things Journal*. 9(23): 23366-23378.
Published
Refereed?: Yes
27. Ge, L; Du, T; Li, C; Li, Y*; Yan, J; Rafiq, MU. (2022). Virtual Collection for Distributed Photovoltaic Data: Challenges, Methodologies, and Applications. *Energies*. 15(23): 8783.
Published
Refereed?: Yes, Open Access?: Yes
28. Li, Z*; Yan, J; Yu, W; Qiu, J. (2021). Event-Triggered Control for a Class of Nonlinear Multi-Agent Systems with Directed Graph. *IEEE Transactions on Systems, Man and Cybernetics: Systems*. 51(11): 6986-6993.
Published
Refereed?: Yes
29. Ge, L; Li, Y*; Yan, J; Wang, Y; Zhang, N. (2021). Short Term Load Prediction of Integrated Energy System with Wavelet Neural Network Model Based on Improved Particle Swarm Optimization and Chaos Optimization Algorithm. *Journal of Modern Power Systems and Clean Energy*. 9(6): 1490-1499.
Published
Refereed?: Yes
30. Ghafouri, M; Karaagac, U; Ameli, A; Yan, J; et al. (2021). A Cyber Attack Mitigation Scheme for Series Compensated DFIG-Based Wind Parks. *IEEE Transactions on Smart Grid*. 12(6): 5221-5232.
Published
Refereed?: Yes
31. Kabir, E*; Assi, C; Tushar, M; Yan, J. (2020). Optimal Scheduling of EV Charging at a Solar Power Based Charging Station. *IEEE Systems Journal*. 14(3): 4221-4231.
Published
Refereed?: Yes
32. Ge, L; Li, Y; Zhu, X; Zhou, Y; Wang, T; Yan J. (2020). An Evaluation System for HVDC Protection Systems by a Novel Indicator Framework and a Self-Learning Combination Method. *IEEE Access*. 8: 152053-152070.
Published
Refereed?: Yes, Open Access?: Yes

33. Ge, L; Xian, Y; Yan, J; et al. (2020). A Hybrid Model for Short-term PV Output Forecasting Based on PCA-GWO-GRNN. *Journal of Modern Power Systems and Clean Energy*. 8(6): 1268-1275.
Published
Refereed?: Yes
34. Wang, H; Pan, X; Yan, J; He, S. (2020). An Extended Regret Theory for Multi-Attribute Decision Making under Interval Type-2 Fuzzy Set Environment. *Information Sciences*. 512: 108-122.
Published
Refereed?: Yes
35. Bai, X; Dong, L; Ge, L; Xu, H; Zhang, J; Yan, J. (2020). Robust Localization of Mobile Robot in Industrial Environments With Non-Line-of-Sight Situation. *IEEE Access*. 8: 22537-22545.
Published
Refereed?: Yes, Open Access?: Yes
36. Ge, L; Zhang, S; Bai, X; Yan, J; et al. (2020). Optimal Capacity Allocation of Energy Storage System Considering Uncertainty of Load and Wind Generation. *Mathematical Problems in Engineering*. 512
Published
Refereed?: Yes
37. Ge, L; Li, Y; Li, S; Zhu, J; Yan, J. (2020). Evaluation of the Situational Awareness Effects for Smart Distribution Networks under the Novel Design of Indicator Framework and Hybrid Weighting Method. *Frontiers in Energy*.
Published
Refereed?: Yes
38. Hou, L*; Wang, C; Yan, J. (2020). Bidding for Preferred Timing: An Auction Design for Electric Vehicle Charging Station Scheduling. *IEEE Transactions on Intelligent Transportation Systems*. 21(8): 3332-3343.
Published
Refereed?: Yes
39. Kabir, E*; Assi, C; Alameddine, H; Antoun, J; Yan, J. (2020). Demand-Aware Provisioning of Electric Vehicles Fast Charging Infrastructure. *IEEE Transactions on Vehicular Technology*. 69(7): 6952-6963.
Published
Refereed?: Yes
40. Wang, D; Ha, M; Qiao, J; Yan, J; Xie, Y. (2020). Data-Based Composite Control Design with Critic Intelligence for A Wastewater Treatment Platform. *Artificial Intelligence Review*. (53): 3773-3785.
Published
Refereed?: Yes
41. Wu, F*; Yang, J; Yan, J; et al. (2020). Charging Power Demand Analysis of Electric Vehicles Considering Users' Bounded Rational Behavior. *International Journal of Electrical Power and Energy Systems*. 119: 105952.
Published
Refereed?: Yes
42. Ghafouri, M*; Minh, A; Kassouf, M; Debbabi, M; Assi, C; Yan, J. (2020). Detection and Mitigation of Cyber Attacks on Voltage Stability Monitoring of Power System. *IEEE Transactions on Smart Grid*. 11(6): 5227-5238.
Published
Refereed?: Yes
43. Jiang, G*; He, H; Yan, J; Xie, P. (2019). Multiscale Convolutional Neural Networks for Fault Diagnosis of Wind Turbine Gearbox. *IEEE Transactions on Industrial Electronics*. 66(4): 3196-3207.
Published
Refereed?: Yes

44. Wang, H; Yao, J*; Yan, J; Dong, M. (2019). An Extended TOPSIS Method Based on Gaussian Interval Type-2 Fuzzy Set. *International Journal of Fuzzy Systems*. 21(6): 1831-1843.
Published
Refereed?: Yes
45. Dong, L*; Yan, J; Yuan, X*; He, H; Sun, C. (2019). Functional Nonlinear Model Predictive Control Based on Adaptive Dynamic Programming. *IEEE Transactions on Cybernetics*. 49(12): 4206-4218.
Published
Refereed?: Yes
46. Li, S; Li, L*; Yan, J; He, H. (2018). SDE: A Novel Clustering Framework Based on Sparsity-Density Entropy. *IEEE Transactions on Knowledge and Data Engineering*. 30(8): 1575-1587.
Published
Refereed?: Yes
47. Jiang, G*; Xie, P; He, H; Yan, J. (2018). Wind Turbine Fault Detection Using Denoising Autoencoder with Temporal Information. *IEEE/ASME Transactions on Mechatronics*. 23(1): 89-100.
Published
Refereed?: Yes

Book Chapters

1. Hou L*, Wang C, Yan J. (2019). Electric Vehicle Charging Scheduling in Green Logistics: Challenges, Approaches and Opportunities. Awasthi A, Grzybowska K. *Sustainable City Logistics Planning: Methods and Applications*. : 1-22.
In Press, NOVA Publishers
Refereed?: Yes

Conference Publications

1. Hu*, C; Wu, H; Li, X; Ma, C; Chen, X; Yan, J; Wang, B; Liu, X. (2024). Less or More From Teacher: Exploiting Trilateral Geometry For Knowledge Distillation. *International Conference on Learning Representations (ICLR)*,
Paper
Accepted
Refereed?: Yes, Invited?: No
2. Chen, J*; Du, H*; Yan, J; Zgheib, R; Debbabi, M. (2023). A Data Integrity Attack Targeting VSC-HVDC-Connected Offshore Wind Farms. *IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)*, Scotland,
Conference Date: 2023/10
Paper
Published
Refereed?: Yes, Invited?: No
3. Li, Y*; Hou, L; Yan, J; Liu, Y; Ghafouri, M; Zhang, P. (2023). A Two-Stage Packetized Energy Trading and Management Framework for Virtual Power Plants. *IEEE Power & Energy Society General Meeting (PESGM)*, Orlando, FL, United States of America
Conference Date: 2023/7
Paper
Published
Refereed?: Yes, Invited?: No

4. Chen, y; Wu, P; Li*, Y; Zhang, P; Yan, J; Ghafouri, M; Liu, Y. (2023). A Blockchain-based Co-Simulation Platform for Transparent and Fair Energy Trading and Management. ACM International Symposium on Blockchain and Secure Critical Infrastructure, Melbourne, Australia
Conference Date: 2023/7
Paper
Published
Refereed?: Yes, Invited?: No
5. Liao, J*; Yan, J; Tao, Q. (2023). DualHGNN: A Dual Hypergraph Neural Network for Semi-Supervised Node Classification Based on Multi-View Learning and Density Awareness. International Joint Conference on Neural Networks (IJCNN), Australia
Conference Date: 2023/6
Paper
Published
Refereed?: Yes, Invited?: No
6. Chen, J*; Yan, J; Du, H*; Debbabi, M; Kassouf, M. (2023). Vulnerability Analysis of Virtual Power Plant Voltage Support under Denial-of-Service Attacks. North American Innovative Smart Grid Technologies Conference (ISGT-NA), Washington DC, United States of America
Conference Date: 2023/1
Paper
Published
Refereed?: Yes, Invited?: No
7. Du, H*; Yan, J; Ghafouri, M; Zgheib, R; Debbabi, M. (2022). Online Attack-aware Risk Management for PMSG-based Wind Farm Depending on System Strength Evaluation. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Singapore
Paper
Published
Refereed?: Yes, Invited?: No
8. Du, W; Yang, J; Chen, T*; Yao, J*; Yan, J; Ge, H; Bhuiyan N; Zhou, F; Liu, X; Zeng, Y. (2022). Sustainable Policy Design - How Policy impacts Household Waste Management: A Case-study from Shanghai. International Conference on Building Energy and Environment (COBEE),
Paper
Published
Refereed?: Yes, Invited?: No
9. Li, Y*; Hou, L; Du, H*; Yan, J; Liu, Y; Ghafouri, M; Zhang, P. (2022). PEMT-CoSim: A Co-Simulation Platform for Packetized Energy Management and Trading in Distributed Energy Systems. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Singapore
Paper
Published
Refereed?: Yes, Invited?: No
10. Ge, L; Liu, H, Rafiq, M; Yan, J; Li, Y. (2022). Complex Affine Model of Line Loss for Distribution Network Considering Line Parameter Uncertainty. IEEE Power & Energy Society General Meeting, Denver, United States of America
Paper
Published
Refereed?: Yes, Invited?: No

11. Li, Y*; Yan, J, Naili, M. (2022). Deep Reinforcement Learning for Penetration Testing of Cyber-Physical Attacks in the Smart Grid. IEEE World Congress on Computational Intelligence (WCCI)/International Joint Conference on Neural Networks (IJCNN), Padua, Italy
Conference Date: 2022/7
Paper
Published
Refereed?: Yes, Invited?: No
12. Sun, F*; Tao, Q; Yan, J; Hu, J; Yang, Z. (2022). MRGAN: Multi-Criterion Relational GAN for Lyrics-Conditional Melody Generation. IEEE World Congress on Computational Intelligence (WCCI)/International Joint Conference on Neural Networks (IJCNN), Padua, Italy
Conference Date: 2022/7
Paper
Published
Refereed?: Yes, Invited?: No
13. Li, S*; Qiao, L*; Zhang, Y, Yan, J. (2022). An Early Forest Fire Detection System Based On M300 Drone and H20T Camera. International Conference on Unmanned Aircraft System (ICUAS), Dubrovnik, Croatia
Conference Date: 2022/6
Paper
Published
Refereed?: Yes, Invited?: No
14. Chen, T*; Yang, J*; Du, W*; Yao, J*; Yan, J; Ge, H; Bhuiyan, N; Zhou, F; Liu, Y; Zeng, Y. (2022). Data Quality Criteria for Urban Waste Management Policy-Making Using Environment-based Design. IFAC Conference on Manufacturing Modelling, Management and Control (MIM), Nantes, France
Conference Date: 2022/6
Paper
Published
Refereed?: Yes, Invited?: Yes
15. Ge, L; Li, Y; Yan, J. (2021). Self-Adaptive Evaluation of Hybrid AC/DC Distribution Networks with Multi-Energy Complementary Systems. IEEE Power & Energy Society General Meeting (PESGM),
Paper
Published
Refereed?: Yes, Invited?: No
16. Du, H*; Yan, J; et al. (2021). Modeling of Cyber Attacks Against Converter-Driven Stability of PMSG-Based Wind Farms with Intentional Subsynchronous Resonance. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Aachen, Germany
Conference Date: 2021/10
Paper
Published
Refereed?: Yes, Invited?: No
17. Zhang, M; Fu, S; Yan, J; et al. (2021). An XGBoost-Based Vulnerability Analysis of Smart Grid Cascading Failures under Topology Attacks. IEEE International Conference on Systems, Man, and Cybernetics (SMC), Melbourne, Australia
Conference Date: 2021/10
Paper
Published
Refereed?: Yes, Invited?: No

18. Du, W*; Yang, J*; Ge, H; Yan, J; Nadia, B; Liu, X; Zhou, F; Zeng, Y. (2021). Environment-Based Design (EBD) Approach to Identify Critical Issues in Managing Municipal Solid Waste: Nairobi, Kenyan Case Study. International Conference on Smart Data and Smart Cities, Stuttgart, Germany
Conference Date: 2021/9
Paper
Published
Refereed?: Yes, Invited?: No
19. Liao, P*; Chang, Y; Yan, J. (2020). Electrochemical Method on the Optimum Cathodic Protection Potential of Grounding Grid in High Resistivity Soil. IEEE Power & Energy Society General Meeting (PESGM), Montreal, Canada
Conference Date: 2020/8
Paper
Published
Refereed?: Yes, Invited?: No
20. Hu, C*; Yan, J; Liu, X. (2020). Adaptive Feature Boosting of Multi-Sourced Deep Autoencoders for Smart Grid Intrusion Detection. IEEE Power & Energy Society General Meeting (PESGM), Montreal, Canada
Conference Date: 2020/8
Paper
Published
Refereed?: Yes, Invited?: No
21. Ge, L; Xian, Y; Yan, J; Wang, Y; Li, Y*; Liang, D. (2020). A FA-GWO-GRNN Method for Short-Term Photovoltaic Output Prediction. IEEE Power & Energy Society General Meeting (PESGM), Montreal, Canada
Conference Date: 2020/8
Paper
Published
Refereed?: Yes, Invited?: No
22. Zhang, S; Bai, X; Ge, L; Yan, J. (2020). Optimal Configuration of Energy Storage System Considering Uncertainty of Load and Wind Generation. IEEE Power & Energy Society General Meeting (PESGM), Montreal, Canada
Conference Date: 2020/8
Paper
Published
Refereed?: Yes, Invited?: No
23. Rahman, M*; Li, Y*; Yan, J. (2020). Multi-Objective Evolutionary Optimization for Worst-Case Analysis of False Data Injection Attacks in the Smart Grid. IEEE World Congress on Computational Intelligence (WCCI)/Congress on Evolutionary Computation (CEC), Glasgow, United Kingdom
Conference Date: 2020/7
Paper
Published
Refereed?: Yes, Invited?: No
24. Zhang, Y*; Yan, J. (2020). Semi-Supervised Domain-Adversarial Training for Intrusion Detection against False Data Injection in the Smart Grid. IEEE World Congress on Computational Intelligence (WCCI)/International Joint Conference on Neural Networks (IJCNN), Glasgow, United Kingdom
Conference Date: 2020/7
Paper
Published
Refereed?: Yes, Invited?: No

25. Hou, L*; Ma, S; Yan, J; et al. (2020). Reinforcement Mechanism Design for Electric Vehicle Demand Response in Microgrid Charging Stations. IEEE World Congress on Computational Intelligence (WCCI)/ International Joint Conference on Neural Networks (IJCNN), Glasgow, United Kingdom
Conference Date: 2020/7
Paper
Published
Refereed?: Yes, Invited?: No
26. Lardier, W*; Varo, Q*; Yan, J. (2020). Dynamic Reduced-Round Cryptography for Energy-Efficient Wireless Communication of Smart IoT Devices. IEEE International Conference on Communications (ICC), Dublin, Ireland
Conference Date: 2020/6
Paper
Published
Refereed?: Yes, Invited?: No
27. Li, Z; Yan, J; Yu, W; Qiu, J. (2019). Adaptive Event-Triggered Consensus Control for A Class of Unknown Second-Order Nonlinear Multi-Agent Systems. Chinese Control Conference (CCC2019),
Paper
Published
Refereed?: Yes, Invited?: No
28. Lardier, W*; Varo, Q*; Yan, J. (2019). Quantum-Sim: An Open-Source Co-Simulation Platform for Quantum KeyDistribution-Based Smart Grid Communications. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Paper
Published
Refereed?: Yes, Invited?: No
29. Hou, L*; Yan, J; Wang, C. (2019). Accommodating More Users in Highway Electric Vehicle Charging through Coordinated Booking: A Market-Based Approach. IEEE International Conference on Computer Supported Cooperative Work in Design (CSCWD),
Paper
Published
Refereed?: Yes, Invited?: No
30. Hu, C*; Yan, J; Wang C. (2019). Robust Feature Extraction and Ensemble Classification Against Cyber-Physical Attacks in the Smart Grid. IEEE Electrical Power and Energy Conference (EPEC), Montreal, Canada
Paper
Published
Refereed?: Yes, Invited?: No
31. Zhang, Y*; Yan, J. (2019). Domain-Adversarial Transfer Learning Against Unknown Threats in SmartGrid Communications. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Paper
Published
Refereed?: Yes, Invited?: No
32. Kabir, E*; Assi, C; Alameddine, H; Antoun, J; Yan, J. (2019). Demand Aware Deployment and Expansion Method for an Electric Vehicles Fast Charging Network. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Paper
Published
Refereed?: Yes, Invited?: No

33. Rahman, M*; Yan, J. (2019). Finding the Worse Case: Undetectable False Data Injection with Minimized Knowledge and Resource. IEEE Global Communications Conference (GLOBECOM), Waikoloa Village, United States of America
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No
34. Hu, C*; Yan, J; Wang, C. (2019). Advanced Cyber-Physical Attack Classification with Extreme Gradient Boosting for Smart Transmission Grids. IEEE Power and Energy Society (PES) General Meeting, Atlanta, GA, United States of America
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
35. Wilson, D*; Yan, J; Tang, Y; Lu, Z. (2018). Deep Learning-Aided Cyber-Attack Detection in Power Transmission Systems. IEEE Power and Energy Society (PES) General Meeting, Portland, United States of America
Conference Date: 2018/8
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Patents

1. Modeling of Adversarial Artificial Intelligence in Blind False Data Injection against AC State Estimation in the Smart Grid Security, Safety and Reliability. Canada. P102858WO01 (internal).
Patent Status: Pending
Inventors: Fapi E, Rahman M, Yan J
2. Penetration Testing Method for Cyber-Physical Systems. United States of America. 2022/12/21.
Patent Status: Pending
Inventors: Li Y, Naili M, Yan J



Date Submitted: 2024-01-21 21:15:38

Confirmation Number: 1729997

Template: NSERC_Researcher

Dr. Amr Youssef

Correspondence language: English

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Protected when completed

Dr. Amr Youssef

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
Arabic	Yes	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	Yes	Yes
French	No	No	No	No	No

Degrees

- 2001/10 Post-doctorate, Cryptography and Data Security, University of Waterloo
Supervisors: Guang Gong, 1999/9 - 2011/8
- 1997/12 Doctorate, Cryptography and Data Security, Queen's University at Kingston
Supervisors: Tavares, Stafford, 1993/9 - 1997/12
- 1993/9 Master's Thesis, Speech Recognition, Cairo University
Supervisors: Mohsen Rashwan, 1990/10 - 1993/7
- 1990/7 Bachelor's, Electronics and Communications, Cairo University

Recognitions

- 2022/12 Best Paper Award
Anti-Phishing Working Group (APWG)
Prize / Award
Our paper entitled "Leaky Kits: The Increased Risk of Data Exposure from Phishing Kits" presented at Symposium on Electronic Crime Research (eCrime 2022) was awarded the best paper award. We were also invited to present the work to Canadian Radio-television and Telecommunications Commission (CRTC).
- 2021/7 First place student paper contest
Organization committee for the 7th IEEE World Forum on Internet of Things, WF-IoT 2021
Prize / Award
Title: Lightweight Authentication and Key Agreement Protocol for Edge Computing
Applications Authors: Nakkar M*, AlTawy R, and Youssef A
- 2020/12 - 2020/12 Distinguished Paper Award. Annual Computer Security Applications Conference (ACSAC 2020)
Applied Computer Security Associates
Prize / Award
Title: Betrayed by the Guardian: Security and Privacy Risks of Parental Control Solutions
Authors Ali S*, Elgharabawy M*, Duchaussoy Q*, Mannan M, Youssef A

- 2020/11 Innovation Prize 2020 Finalist, Industrial Research sector
Consortium for Research and Innovation in Aerospace in Quebec (CRIAQ)
Prize / Award
Awarded by Consortium for Research and Innovation in Aerospace in Quebec (CRIAQ) in partnership with Mannarino, Nordiasoft, Polytechnique and Concordia University in recognition for the work done in the project entitled Real-Time Operating System For Safety Critical Systems
- 2018/6 Tier I ENCS Research Excellence Award
Concordia University
Prize / Award
Engineering and Computer Science (ENCS) Research Excellence Award
- 2017/12 Best Paper Award, , 7th workshop on Socio-Technical Aspects in Security and Trust, (STAST 2017).
Technical Program Committee of STATS 2017
Prize / Award
Title: Towards a Comprehensive Framework for Evaluating Smart Toys' Privacy Practices
Authors: Mahmoud M*, Hossen M*, Barakat H*, Mannan M and Youssef A
- 2017/12 2nd prize for Best Poster Presentation, the 29th IEEE International Conference on Microelectronics, ICM 2017
Technical Program Committee of ICM 2017
Prize / Award
Paper Title: A Power Analysis Resistant FPGA Implementation of NTRUEncrypt, Authors: Mahmoud M*, Nakkar M*, and Youssef A

User Profile

Research Specialization Keywords: Cryptography, Cryptanalysis, Network security, Symmetric key systems, Cyber-physical systems security

Employment

- 2011/6 Professor
Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University
Full-time, Professor
Tenure Status: Tenure
- 2004/8 - 2011/6 Associate Professor
Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2001/10 - 2004/7 Assistant professor
Electronics and Communications Engineering Dept, Engineering, Cairo University
Full-time, Assistant Professor
Tenure Status: Tenure
- 2001/10 - 2004/7 Part time Research Scientist
Technology Development Center, IBM

1999/10 - 2001/10	Postdoctor Combinatorics and Optimization, University of Waterloo Full-time Tenure Status: Non Tenure Track
1998/1 - 1999/4	Systems Engineer Broadband Wireless Access, Nortel Networks
1992/3 - 1993/9	Part-time Research Associate Scientific Center, IBM
1990/9 - 1993/8	Appointed full-time Teaching Assistant Dept. of Electronics and Communications Engineering, Cairo University Full-time Tenure Status: Tenure Track

Research Funding History

Awarded [n=9]

2020/5 - 2026/4 Principal Investigator	Cryptographic Methods for Securing CyberPhysical Systems, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) NSERC Discovery Total Funding - 276,000 Portion of Funding Received - 276,000 Funding Competitive?: Yes
2023/6 - 2024/6 Co-applicant	Privacy Analysis of AR/VR Online Shopping Applications, Grant Funding Sources: Office of Privacy Commissioner of Canada Total Funding - 34,454 Portion of Funding Received - 17,227 Funding Competitive?: Yes Co-applicant : Mannan; Mohammad
2022/4 - 2023/3 Co-applicant	Privacy Analysis of Technologies Used in Intimate Partner Abuse, Grant Funding Sources: Office of Privacy Commissioner of Canada Total Funding - 48,836 Portion of Funding Received - 24,418 Funding Competitive?: Yes Co-applicant : Mannan; Mohammad
2021/5 - 2022/6 Co-applicant	Privacy Report Card for Online Solutions Targeting Seniors, Grant Funding Sources: Office of Privacy Commissioner of Canada Total Funding - 49,739 Portion of Funding Received - 24,869 Funding Competitive?: Yes
2020/6 - 2021/5 Co-investigator	Detecting advanced phishing and malicious websites, Grant Funding Sources: Canadian Internet Registration Authority Total Funding - 52,325

Portion of Funding Received - 26,162
Funding Competitive?: Yes

2018/9 - 2020/9
Co-applicant

Enabling IoT Analytics across Edge and Cloud Platforms, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
Strategic Grant

Total Funding - 480,000

Portion of Funding Received - 90,000

Funding Competitive?: Yes

Co-applicant : Hafid, Abdelhakim;

Principal Investigator : Cherkaoui, Soumaya

2015/5 - 2020/4
Principal Investigator

Analysis and Design of Authenticated Encryption Schemes, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery

Total Funding - 150,000

Portion of Funding Received - 150,000

Funding Competitive?: Yes

2019/4 - 2020/3
Co-applicant

Privacy Report Card for Parental Control Solutions, Grant

Funding Sources:

Office of the Privacy Commissioner of Canada

Total Funding - 49,739

Portion of Funding Received - 24,869

Funding Competitive?: Yes

Co-applicant : Mannan, Muhammad

2018/3 - 2020/2
Principal Investigator

Real-Time Operating System For Safety Critical Systems, Contract

Funding Sources:

Quebec (CRIAQ)

Total Funding - 169,900

Portion of Funding Received - 169,900

Funding Competitive?: Yes

Completed [n=4]

2018/4 - 2019/3
Co-applicant

Privacy Leakage in Canadian Public Wi-Fi Networks, Office of Privacy Commissioner of Canada, Contract

Funding Sources:

Office of the Privacy Commissioner of Canada

Total Funding - 58,391

Portion of Funding Received - 29,195

Funding Competitive?: Yes

Co-applicant : Mannan, Muhammad

2018/6 - 2018/11
Principal Investigator

Exploring the Blockchain Technology in Electricity Trading, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
Engage

Total Funding - 25,000

Portion of Funding Received - 25,000

2017/4 - 2018/3 Co-applicant	Funding Competitive?: Yes Privacy report card for children's smart toys, Office of Privacy Commissioner of Canada, Grant Funding Sources: Office of the Privacy Commissioner of Canada Total Funding - 49,767 Portion of Funding Received - 24,883 Funding Competitive?: Yes Co-applicant : Mannan, Muhammad
2016/9 - 2017/2 Principal Investigator	Methods and Techniques for the Analysis of Encrypted Traffic, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Engage Total Funding - 25,000 Portion of Funding Received - 25,000 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=24]

2023/9 - 2025/8 Co-Supervisor	Rezaei, Fahimeh (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Privacy issues in Single-Sign-On Present Position: M.A.Sc student, Concordia University
2023/9 - 2025/8 Principal Supervisor	Hawis, Tariq (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Cybersecurity of fleet managment platforms Present Position: M.A.Sc student, Concordia University
2023/6 - 2023/11 Co-Supervisor	Francesca Stabile (In Progress) , University of Calabria Thesis/Project Title: Encrypted Control of Cyber-physical Systems (MITAC visting student) Present Position: PhD Student, University of Calabria
2022/9 - 2024/9 Principal Supervisor	Mangeard, Philippe (In Progress) , Concordia University Student Degree Expected Date: 2024/9 Thesis/Project Title: Privacy Analysis of Technologies Used in Intimate Partner Abuse Present Position: Master Student, Concordia University
2022/9 - 2024/8 Co-Supervisor	Khan, Md Shakib (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: Graph Neural Network based anomay detection systems Present Position: M.A.Sc student, Concordia University
2022/9 - 2024/9 Co-Supervisor	Lamisa, Kazi Farhat (In Progress) , Concordia University Student Degree Expected Date: 2024/9 Thesis/Project Title: Security Analysis of Security of Web Authentication Protocols Present Position: Master Student, Concordia University

2022/9 - 2024/9 Principal Supervisor	Ragab, Abdelrahman (In Progress) , Concordia University Student Degree Expected Date: 2024/9 Thesis/Project Title: Privacy Issues in Virtual Reality and Augmented Reality Apps Present Position: Master Student, Concordia University
2022/1 - 2023/11 Co-Supervisor	Baskaran, Supraja (In Progress) , Concordia University Student Degree Expected Date: 2023/11 Thesis/Project Title: Authentication problems in the super-app ecosystems Present Position: M.A.Sc student, Concordia University
2021/9 - 2023/8 Principal Supervisor	Xiufen Yu (Completed) , Concordia University Thesis/Project Title: Privacy analysis of hospitals websites Present Position: M.A.Sc student, Concordia University
2021/1 - 2023/1 Co-Supervisor	Bhaskar Tejaswi (Completed) , Concordia University Thesis/Project Title: Analysis of Live Phishing Kits Present Position: M.A.Sc student, Concordia University
2021/1 - 2023/1 Co-Supervisor	Rohan Pagey (Completed) , Concordia University Thesis/Project Title: Security analysis of elderly-focused IoT devices Present Position: M.A.Sc student, Concordia University
2020/9 - 2022/8 Co-Supervisor	Kapoor, Pranay (Completed) , Concordia University Thesis/Project Title: Privacy analysis of Android Apps Present Position: Master Student, Concordia University
2020/9 - 2022/4 Co-Supervisor	Kluban, Maryna (Completed) , Concordia University Thesis/Project Title: Security analysis of Java scripts Present Position: Master Student, Concordia University
2019/9 - 2021/10 Principal Supervisor	Elgharabawy, Mounir (Completed) , Concordia University Thesis/Project Title: Cross-vendor Security Analysis of Android Unix Domain Sockets Present Position: Master Student, Concordia University
2019/9 - 2021/12 Co-Supervisor	Shobiri, Behnam (Completed) , Concordia University Thesis/Project Title: CDNS' DARK SIDE: SECURITY PROBLEMS IN CDN-TO-ORIGIN CONNECTIONS Present Position: Master Student, Concordia University
2019/5 - 2021/8 Co-Supervisor	Shahab Uddin, Md (Completed) , Concordia University Thesis/Project Title: SECURITY ASSESSMENT FRAMEWORK FOR ANDROID CRYPTO WALLETS Present Position: Master Student, Concordia University
2019/1 - 2020/11 Co-Supervisor	Duchaussoy, Quentin (Completed) , Concordia University Thesis/Project Title: Privacy of Parental Control Applications Present Position: Master Student, Concordia University
2019/1 - 2020/11 Co-Supervisor	Abdelwahab, Ahmed (Completed) , Concordia University Thesis/Project Title: Secure Control for Cyber-Physical Systems Present Position: Master Student, Concordia University
2018/9 - 2020/8 Co-Supervisor	Safaie, Tina (Completed) , Concordia University Thesis/Project Title: Security and Usability of Password Managers Present Position: Master Student, Concordia University
2018/9 - 2020/9 Co-Supervisor	Osman, Tousif (Completed) , Concordia University Thesis/Project Title: Mobile Operating Systems Security Present Position: Master Student, Concordia University

2018/9 - 2020/5 Co-Supervisor	Ali, Suzan (Completed) , Concordia University Thesis/Project Title: Privacy Analysis of Canadian Wi-Fi Hotspots Present Position: Master Student, Concordia University
2018/6 - 2018/6 Principal Supervisor	Waked, Louis (Completed) , Concordia University Thesis/Project Title: Analyzing TLS Interception in Middleware Network Appliances Present Position: Security Analyst, Morgan Stanley, Montreal
2017/1 - 2019/12 Principal Supervisor	Shasha, Sharon (In Progress) , Concordia University Student Degree Expected Date: 2019/12 Thesis/Project Title: Privacy and Security Analysis of IoT in Smart Homes Present Position: Lecturer, Dawson College, Montreal
2016/5 - 2018/3 Principal Supervisor	Mahmoud, Moustafa (Completed) , Concordia University Thesis/Project Title: An Experimental Evaluation of Smart Toys' Security and Privacy Practices Present Position: Cyber security analyst, onePoint for BNP Paribas bank, Montreal
Doctorate [n=13]	
2022/1 - 2026/1 Principal Supervisor	Hofny, Mahmoud Abdelsattar (In Progress) , Concordia University Student Degree Expected Date: 2026/1 Thesis/Project Title: Trusted Execution Environment (TEE)-enabled security protocols Present Position: Concordia University, Concordia University
2021/9 - 2023/8 Principal Supervisor	Ahmed Aly (In Progress) , Concordia University Student Degree Expected Date: 2026/8 Thesis/Project Title: Detecting Advanced Persistent Threats in Early Stages Present Position: M.A.Sc student, Concordia University
2019/9 - 2023/8 Principal Supervisor	Seifelnasr, Mohamed (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: Security of Cyber Physical Systems Present Position: PhD Student, Concordia University
2019/5 - 2019/5 Co-Supervisor	Kamel, Mahmoud (Completed) , Concordia University Thesis/Project Title: Performance Evaluation of Ultra-Dense Networks with Applications in Internet-of-Things Present Position: Postdoctoral fellow, McGill University
2019/1 - 2022/12 Principal Supervisor	Nakkar, Mouna (In Progress) , Concordia University Student Degree Expected Date: 2022/12 Thesis/Project Title: Cryptographic protocols for IoT and edge computing Present Position: PhD student, Concordia University
2018/9 - 2022/8 Principal Supervisor	Elsayed, Mohammed (Completed) , Concordia University Thesis/Project Title: Machine to Machine Communications Present Position: PhD student, Concordia University
2017/9 - 2022/4 Principal Supervisor	Galal, Hisham (Completed) , Concordia University Thesis/Project Title: Privacy of Blockchain applications Present Position: PhD student, Concordia University
2017/5 - 2022/4 Co-Supervisor	Cabana, Olivier (In Progress) , Concordia University Student Degree Expected Date: 2024/1 Thesis/Project Title: Cyber Threat Intelligence for Industrial Control Systems Present Position: PhD Student, Concordia University

- 2017/1 - 2021/5
Principal Supervisor ElSheikh, Muhammad (Completed) , Concordia University
Thesis/Project Title: MILP-based Cryptanalysis of Symmetric Key Ciphers
Present Position: PhD Student, Concordia University
- 2016/9 - 2017/6
Principal Supervisor Nakkar, Mouna (In Progress) , Concordia University
Student Degree Expected Date: 2024/1
Thesis/Project Title: Secure Hardware Implementation of Post Quantum Cryptosystems
Present Position: PhD Student, Concordia University
- 2014/9 - 2019/12
Principal Supervisor AL-Barakati, Abdullah (In Progress) , Concordia University
Student Degree Expected Date: 2018/8
Thesis/Project Title: Smart Grid Security
Present Position: PhD student, Concordia University
- 2014/1 - 2017/12
Principal Supervisor Tolba, Mohamed (Completed) , Concordia University
Thesis/Project Title: Analysis and Design of Symmetric Key Primitives
Present Position: MITACS Postdoctoral fellow, Concordia University and Manarino Systems and Software Inc
- 2013/9 - 2017/12
Principal Supervisor Ahmed AbdelKhalek (Completed) , Concordia University
Thesis/Project Title: Analysis and Design of Symmetric Key Primitives
Present Position: Systems Engineer, Nokia

Post-doctorate [n=1]

- 2018/1 - 2019/12
Principal Supervisor Tolba, Mohamed (Completed) , Concordia University
Thesis/Project Title: Cyber Security in Avionics Systems
Present Position: Postdoctoral fellow, Concordia University and Manarino Systems and Software Inc

Event Administration

- 2023/9 - 2024/7
Technical Program Committee Member, 15th International Conference on Cryptology in Africa (AFRICACRYPT 2024), Conference, 2024/7 - 2024/7
- 2023/7 - 2024/3
Technical Program Committee Member, 22nd International Conference on Applied Cryptography and Network Security (ACNS 2024), Conference, 2024/3 - 2024/3
- 2023/10 - 2023/12
Technical Program Committee Member, 14th International Conference on Security, Privacy, and Applied Cryptographic Engineering (SPACE 2024), Conference, 2023/12 - 2023/12
- 2023/4 - 2023/7
Technical Program Committee Member, 5th International Congress on Blockchain and Applications (BLOCKCHAIN'23), Conference, 2023/7 - 2023/7
- 2023/2 - 2023/6
Technical Program Committee Member, Technical Program Committee Member, 9th Workshop on Current Trends in Cryptology (CTCrypt 2023), Conference, 2023/6 - 2023/6
- 2022/9 - 2023/3
Technical Program Committee Member, 2023 IEEE PES Conference on Innovative Smart Grid Technologies - Middle East (ISGT Middle East, Conference, 2023/3 - 2023/3
- 2022/9 - 2022/12
Technical Program Committee Member, 12th International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2022),, Conference, 2022/12 - 2022/12
- 2022/8 - 2022/10
Technical Program Committee Member, International conference on Cryptography, Coding theory and Cyber security (I4CS'22), Conference, 2022/10 - 2022/10

2022/5 - 2022/8	Technical Program Committee Member, The 19th Annual International Conference on Privacy, Security & Trust (PST2022), Conference, 2022/8 - 2022/8
2022/5 - 2022/7	Technical Program Committee Member, 4th International Congress on Blockchain and Applications (BLOCKCHAIN'22), Conference, 2022/7 - 2022/7
2022/4 - 2022/6	Technical Program Committee Member, The 4th Blockchain Technology Symposium (BTS 2022), Conference, 2022/6 - 2022/6
2021/7 - 2021/12	Technical Program Committee Member, THE FIFTH IEEE WORKSHOP ON 5G AND BEYOND WIRELESS SECURITY (5TH IEEE WIRELESS-SEC 2021), Workshop, 2021/12 - 2021/12
2021/11 - 2021/11	Technical Program Committee Member, Eleventh International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2021), Conference, 2021/11 - 2021/11
2021/10 - 2021/11	Technical Program Committee Member, The 4th IEEE International Symposium on Future Cyber Security Technologies (FCST 2021), Conference, 2021/11 - 2021/11
2021/9 - 2021/11	Technical Program Committee Member, The Fifteenth International Conference on Emerging Security Information, Systems and Technologies (SECURWARE 2021), Conference, 2021/11 - 2021/11
2021/5 - 2021/6	Technical Program Committee Member, 3rd International Congress on Blockchain and Applications (BLOCKCHAIN'21), Conference, 2021/6 - 2021/6
2021/2 - 2021/6	Technical Program Committee Member, 10th Workshop on Current Trends in Cryptology (CTCrypt 2021), Conference, 2021/6 - 2021/6
2020/12 - 2020/12	Technical Program Committee Member, Tenth International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2020), Conference, 2020/12 - 2020/12
2020/7 - 2020/7	Technical Program Co-chair, 12th Annual International Conference on the Theory and Applications of Cryptology (Africacrypt 2020), Conference, 2020/7 - 2020/7
2020/6 - 2020/6	Technical Program Committee Member, 9th Workshop on Current Trends in Cryptology (CTCrypt 2020), Conference, 2020/6 - 2020/6
2019/12 - 2019/12	Technical Program Committee Member, 9th International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2019), Conference, 2019/12 - 2019/12
2019/11 - 2019/11	Technical Program Committee Member, 16th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2019), Conference, 2019/11 - 2019/11
2019/8 - 2019/8	Technical Program Committee Member, 17th Annual Conference on Privacy, Security and Trust (PST2019), Conference, 2019/8 - 2019/8
2019/7 - 2019/7	Technical Program Committee Member, 11th Annual International Conference on the Theory and Applications of Cryptology (Africacrypt 2019), Conference, 2019/7 - 2019/7
2019/6 - 2019/6	Technical Program Committee Member, 8th Workshop on Current Trends in Cryptology (CTCrypt 2019), Conference, 2019/6 - 2019/6
2019/4 - 2019/4	Technical Program Committee Member, 3rd International Conference on Codes, Cryptology And Information Security (C2SI 2019), Conference, 2019/4 - 2019/4
2018/12 - 2018/12	Technical Program Committee Member, 8th International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2018), Conference, 2018/12 - 2018/12
2018/11 - 2018/11	Organization chair, 11th International Symposium on Foundations & Practice of Security (FPS 2018), Conference, 2108/11 - 2018/11

2018/8 - 2018/8	Technical Program Committee Member, 25th Conference on Selected Areas in Cryptography 2018 (SAC 2018), Conference, 2018/8 - 2018/8
2018/8 - 2018/8	Technical Program Committee Member, 16th Annual Conference on Privacy, Security and Trust (PST2018), Conference, 2018/8 - 2018/8
2018/6 - 2018/6	Technical Program Committee Member, 7th Workshop on Current Trends in Cryptology (CTCrypt 2018), Conference, 2018/6 - 2018/6
2018/5 - 2018/5	Technical Program Committee Member, 10th Annual International Conference on the Theory and Applications of Cryptology (Africacrypt 2018), Conference, 2018/5 - 2018/5
2017/12 - 2017/12	Technical Program Committee Member, 7th International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2017), Conference, 2017/12 - 2017/12
2017/8 - 2017/8	Technical Program Committee Member, 24th Conference on Selected Areas in Cryptography 2017 (SAC 2017), Conference, 2017/8 - 2017/8
2017/6 - 2017/6	Technical Program Committee Member, 6th Workshop on Current Trends in Cryptology (CTCrypt 2017), Conference, 2017/6 - 2017/6
2017/5 - 2017/5	Technical Program Committee Member, 9th Annual International Conference on the Theory and Applications of Cryptology (Africacrypt 2017), Conference, 2017/5 - 2017/5
2017/4 - 2017/4	Technical Program Committee Member, 2nd International Conference on Codes, Cryptology And Information Security (C2SI 2017), Conference, 2017/4 - 2017/4

Presentations

1. (2019). Privacy Preserving Auctions on top of Ethereum. 3rd International Conference on Codes, Cryptology and Information Security (C2SI-2019), Rabbat, Morocco
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes

Text Interviews

2020/12/04	Many Popular Parental Control Solutions Are Insecure (This is related to our conference paper entitled: Betrayed by the Guardian: Security and Privacy Risks of Parental Control Solutions), which won the Distinguished paper award at ACSAC 2020., ACM TechNews
2020/01/09	L'impact des voitures électriques sur la sécurité du réseau électrique. This is related to our conference paper entitled: Impact of Electric Vehicles Botnets on the Power Grid, which is published at IEEE Canada Electric Power Conference, EPEC 2019, The Association of Electric Vehicles of Quebec (AVEC)
2019/10/08	Enterprise TLS proxy analysis (This is related to our ASIACCS 2018 paper entitled: To intercept or not to intercept: Analyzing TLS interception in network appliances), ZDNet & Slashdot https://www.zdnet.com/article/its-2018-and-network-middleware-still-cant-handle-tls-without-breaking-encryption/ & https://tech.slashdot.org/story/18/10/08/186222/network-middleware-still-cant-handle-tls-without-breaking-encryption
2018/11/28	Enterprise TLS proxy analysis (This is related to our ASIACCS 2018 paper entitled: To intercept or not to intercept: Analyzing TLS interception in network appliances), eForensics Magazine (https://eforensicsmag.com/good-enough-security-redux-ssl-inspection-devices-can-make-networks-less-secure-by-christopher-louie/)

- 2018/10/09 Enterprise TLS proxy analysis (This is related to our ASIACCS 2018 paper entitled: To intercept or not to intercept: Analyzing TLS interception in network appliances), InformationSecurityBuzz (<https://www.informationsecuritybuzz.com/expert-comments/network-middleware/>)
- 2018/09/27 Enterprise TLS proxy analysis (This is related to our ASIACCS 2018 paper entitled: To intercept or not to intercept: Analyzing TLS interception in network appliances), TheRegister.co.uk (https://www.theregister.co.uk/2018/09/27/tls_proxies_still_mostly_rubbish_say_canadian_infosec_boffins/)
- 2017/07/19 Blockchain-based Anonymous Delivery Systems (This is related to our PST-2017 paper entitled: Lelantos: A Blockchain-based Anonymous Physical Delivery System), Post & parcel (<https://postandparcel.info/82183/news/parcel/anonymous-deliveries/>)
- 2017/07/18 Blockchain-based Anonymous Delivery Systems (This is related to our PST-2017 paper entitled: Lelantos: A Blockchain-based Anonymous Physical Delivery System), CoinTelegraph (<https://cointelegraph.com/news/anonymous-deliveries-canada-introduces-blockchain-tor-based-delivery-system>)
- 2017/07/17 Blockchain-based Anonymous Delivery Systems (This is related to our PST-2017 paper entitled: Lelantos: A Blockchain-based Anonymous Physical Delivery System), Naked Security (<https://nakedsecurity.sophos.com/2017/07/17/what-does-imogen-heap-have-in-common-with-mail-the-blockchain/>)

Publications

Journal Articles

1. Shobir B, Mannan M, Youssef A. (2023). CDN's Dark Side: Security Problems in CDN-to-Origin Connections. ACM Digital Threats: Research and Practice (DTRAP) journal. 4(1): 1-22.
Published
Refereed?: Yes, Open Access?: No
2. Elbayoumi, Mohammed; Ibrahim, Mohamed; Elhoushy, Salah; Hamouda, Walaa; Youssef, Amr. (2023). Performance Analysis of Cellular Ultra Dense IoT Networks With Wireless Backhalls. IEEE Internet of Things Journal. 10(17): 15774-15787.
Published
Refereed?: Yes, Open Access?: No
3. AlTawy, Riham ; Galal, Hisham; Youssef, Amr. (2023). Mjolnir: Breaking the Glass in a Publicly Verifiable yet Private Manner. IEEE Transactions on Network and Service Management. 20(3): 2942 -2956.
Published
Refereed?: Yes, Open Access?: No
4. Tejaswi, Bhaskar; Mannan, Mohammad; Youssef, Amr. (2023). Weaknesses in IoT Management Platforms. IEEE Internet of Things Journal.
Accepted
Refereed?: Yes, Open Access?: No
5. Khan, Omniyah; Youssef, Amr; Salama, Magdy; Elsaadany, Ehab. (2023). Management of Congestion in Distribution Networks utilizing Demand Side Management and Reinforcement Learning. IEEE Systems Journal. 17(3): 4452-4463.
Published
Refereed?: Yes, Open Access?: No

6. Mahmoud, Moustafa ; Mannan, Mohammad ; Youssef, Amr. (2023). APThunter: Detecting Advanced Persistent Threats in Early Stages. Digital Threats: Research and Practice (DTRAP). 4(1): 1-31.
Published
Refereed?: Yes
7. Seifelnasr, Mohamed; AlTawy, Riham; oussef, Amr; Ghadaf, Essam i. (2023). Privacy-Preserving Mutual Authentication Protocol With Forward Secrecy for IoT-Edge-Cloud. IEEE Internet of Things Journal.
Accepted
Refereed?: Yes, Open Access?: No
8. Khan, Omniyah; Youssef, Amr; Salama, Magdy; El-Saadany, Ehab. (2023). Robust Multi-Objective Congestion Management in Distribution Network. IEEE Transactions on Power Systems. 38(4): 3568-3579.
Published
Refereed?: Yes
9. Seifelnasr, Mohamed; AlTawy, Riham ; Youssef, Amr. (2023). SKAFS: Symmetric Key Authentication Protocol with Forward Secrecy for Edge Computing. IEEE Internet of Things Journal.
Accepted
Refereed?: Yes, Open Access?: No
10. Saber, Ahmad; Youssef, Amr; Svetinovic, Davor ; Zeineldin, Hatem; El-Saadany, Ehab. (2023). Cyber-Immune Line Current Differential Relays. IEEE Transactions on Industrial Informatics.
Accepted
Refereed?: Yes, Open Access?: No
11. Galal, Hisham; Youssef, Amr. (2022). Aegis: Privacy-Preserving Market for Non-Fungible Tokens. IEEE Transactions on Network Science and Engineering,. 10(1): 92-102.
Published
Refereed?: Yes, Open Access?: No
12. Saber, A; Youssef, A; Svetinovic, D; Zeineldin, H; El-Saadany, E. (2022). Anomaly-Based Detection of Cyberattacks on Line Current Differential Relays. IEEE Transactions on Smart Grid. 13(6): 4787-4800.
Published
Refereed?: Yes, Open Access?: No
13. Nakkar, Mouna; AlTawy, Riham; Youssef, Amr. (2022). GASE: A Lightweight Group Authentication Scheme with Key Agreement for Edge Computing Applications. IEEE Internet of Things Journal. 10(1): 840-854.
Published
Refereed?: Yes
14. Albarakati A, Robillard C, Karanfil M, Kassouf M, Debbabi M, Youssef A, Ghafouri M, Hadjidj R. (2022). Security Monitoring of IEC 61850 Substations Using IEC 62351-7 Network and System Management. IEEE Transactions on Industrial Informatics. 18(3): 1641-1653.
Published
Refereed?: Yes, Open Access?: No
15. Elbayoumi, M; Hamouda, W; Youssef, A. (2022). Edge Computing and Multiple-Association in Ultra-Dense Networks: Performance Analysis. IEEE Transactions on Communications. 70(8): 5098-5112.
Published
Refereed?: Yes, Open Access?: No
16. Lucia W, Youssef A. (2022). A Key Agreement Scheme for Cyber-Physical Systems. IEEE Transactions on Systems, Man and Cybernetics: Systems. 52(8): 5368-5373.
Published
Refereed?: Yes, Open Access?: No
17. Naseri, A; Lucia, W; Youssef, A. (2022). Confidentiality attacks against encrypted control systems.Cyber-Physical Systems. 9(3): 224-243.
Published
Refereed?: Yes, Open Access?: No

18. Galal, H; Mannan, M; Youssef, A. (2022). Blindfold: Keeping private keys in PKIs and CDNs out of sight. *Computers & Security*. 118: 1-10.
Published
Refereed?: Yes, Open Access?: No
19. Naseri, A; Lucia, A; Youssef, A. (2022). Encrypted Cloud-Based Set-Theoretic Model Predictive Control. *IEEE Control Systems Letters*. 6: 3032 - 3037.
Published
Refereed?: Yes, Open Access?: No
20. Lucia W, Youssef A. (2021). Covert Channels in Stochastic Cyber-Physical Systems. *IET Cyber-Physical Systems: Theory & Applications*. 6(4): 228-237.
Published
Refereed?: Yes, Open Access?: Yes
21. Ali A, Elgharabawy M, Duchaussoy Q, Mannan M, Youssef A. (2021). Parental controls – Safer Internet solutions or new pitfalls?. *IEEE Security & Privacy Magazine*. 19(6): 36-46.
Published
Refereed?: Yes, Open Access?: No
22. Cabana O, Youssef A, Debbabi M, Lebel B, Kassouf M, Atallah A, Agba B. (2021). Threat Intelligence Generation using Network Telescope Data for Industrial Control Systems. *IEEE Transactions on Information Forensics & Security*. 16: 3355-3370.
Published
Refereed?: Yes, Open Access?: No
23. Seifelnasr M, AlTawy R, Youssef A. (2021). Efficient Inter-cloud Authentication and Micropayment Protocol for IoT Edge Computing. *IEEE Transactions on Network and Service Management*. 18(4): 4420-4433.
Published
Refereed?: Yes, Open Access?: No
24. Khan O, El-Saadany E, Youssef A, Shaaban M. (2021). Cyber Security of Market-based Congestion Management Methods in Power Distribution Systems. *IEEE Transactions on Industrial Informatics*. 17(2): 8142-8153.
Published
Refereed?: Yes, Open Access?: No
25. Elbayoumi M, Hamouda W, Youssef A. (2021). Multiple-Association Supporting HTC/MTC in Limited-Backhaul Capacity Ultra-Dense Networks. *IEEE Transactions on Communications*. 69(6): 4113-4127.
Published
Refereed?: Yes, Open Access?: No
26. Ameli A, Ayad A, El-Saadany E, Salama M, Youssef A. (2020). A Learning-Based Framework for Detecting Cyber-Attacks Against Line Current Differential Relays. *IEEE Transactions on Power Delivery*. 36(4): 2274-2286.
Published
Refereed?: Yes
27. Kamel M*, Hamouda W, Youssef A. (2020). Uplink Performance of NOMA-based Combined HTC and MTC in Ultra-Dense Networks. *IEEE Internet of Things Journal*. 7(8): 7319-7333.
Published
Refereed?: Yes, Open Access?: No
28. Nakkar M*, AlTawy A, Youssef A. (2020). Lightweight broadcast authentication protocol for edge-based applications. *IEEE Internet of Things Journal*. 7(12): 11766-11777.
Published
Refereed?: Yes, Open Access?: No

29. Elbayoumi M*, Kamel M*, Hamouda W, Youssef A. (2020). NOMA-assisted machine-type communications in UDN: State-of-the-Art and challenges. *IEEE Communications Surveys & Tutorials*. 22(2): 1276-1304.
Published
Refereed?: Yes, Open Access?: No
30. Abdelwahab A*, Lucia W, Youssef A. (2020). Covert Channels in Cyber-Physical Systems. *IEEE Control Systems Letters*. 5(4): 1273-1278.
Published
Refereed?: Yes, Open Access?: No
31. Waked L, Mannan M, Youssef A. (2020). The Sorry State of TLS Security in Enterprise Interception Appliances. *ACM Digital Threats: Research and Practice (DTRAP)*. 1(2): 1-26.
Published
Refereed?: Yes, Open Access?: No
32. Ayad A, Farag H, ;Youssef A, El-Saadany E. (2020). Cyber-physical attacks on power distribution systems. *IET Cyber-Physical Systems: Theory & Applications*. 5(2): 218-225.
Published
Refereed?: Yes, Open Access?: Yes
33. Lucia W, Youssef A. (2020). Wyner wiretap-like encoding scheme for cyber-physical systems. *IET Cyber-Physical Systems: Theory & Applications*. 5(4): 359-365.
Published
Refereed?: Yes, Open Access?: Yes
34. Osman T, Mannan M, Hengartner U, Youssef A. (2020). Securing Applications against Side-channel Attacks through Resource Access Veto. *Digital Threats: Research and Practice*. 1(4): 1-29.
Published
Refereed?: Yes
35. Kamel M*, Hamouda W, Youssef A. (2020). Uplink Coverage and Capacity Analysis of mMTC in Ultra-Dense Networks. *IEEE Transactions on Vehicular Technology (Impact Factor 5.339)*. 69(1): 746-759.
Published
Refereed?: Yes, Open Access?: No
36. Khalaf M*, Youssef A, El-Saadany E. (2019). Joint detection and mitigation of false data injection attacks in AGC systems. *IEEE Transactions on Smart Grid (Impact Factor 10.49)*. 10(5): 4985 - 4995.
Published
Refereed?: Yes
37. Ameli A*, Hooshyar A, El-Saadany E, Youssef A. (2019). An Intrusion Detection Method for Line Current Differential Relays. *IEEE Transactions on Information Forensics and Security (Impact Factor 6.21)*. 15: 329-344.
Published
Refereed?: Yes
38. Shasha S*, Moustafa M*, Mannan M, Youssef A. (2018). Playing With Danger: A Taxonomy and Evaluation of Threats to Smart Toys. *IEEE Internet of Things Journal (Impact Factor 9.515)*. 6(2): 2986-3002.
Published
Refereed?: Yes
39. Ameli A*, Hooshyar A, Yazdavar H, El-Saadany E, Youssef A. (2018). Attack detection for load frequency control systems using stochastic unknown input estimators. *IEEE Transactions on Information Forensics and Security (Impact Factor 6.21)*. 13(10): 2575-2590.
Published
Refereed?: Yes

40. Elsheikh M*, Tolba M*, Youssef A. (2018). Impossible Differential Attack on Reduced Round SPARX-128/256. IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences (Special Section on Cryptography and Information Security). 101(4): 731-733.
Published
Refereed?: Yes
41. Ameli A*, Hooshyar A, El-Saadany E, Youssef A. (2018). Attack detection and identification for automatic generation control systems. IEEE Transactions on Power Systems (Impact Factor 6.807). 33(5): 4760-4774.
Published
Refereed?: Yes
42. Abdelkhalek A* and Tolba M*, Youssef A. (2018). Related-key differential attack on round-reduced Bel-T-256. IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences (Special Section on Cryptography and Information Security). 101(5): 859-862.
Published
Refereed?: Yes

Books

1. Nitaj A, Youssef A. (2020). Progress in Cryptology–AFRICACRYPT 2020. (12174)Nitaj A, Youssef A.
Published, Springer
Refereed?: Yes
2. Alrabaee S, Debbabi M, Shirani P, Wang L, Youssef A, Rahimian A, Nouh L, Mouheb D, Huang H, Hanna A. (2020). Binary Code Fingerprinting for Cybersecurity: Application to Malicious Code Fingerprinting. : 248.
Published, Springer
Refereed?: Yes

Book Chapters

1. Ragab, Abdelrahman; Mannan, Mohammad ; Youssef, Amr. (2023). Try on, Spied on? : Privacy Analysis of Virtual Try-On Websites and Android Apps. Proceedings of 17th DPM International Workshop on Data Privacy Management, 2023 ESORICS 2022 International Workshops. : 1-17.
Accepted, Springer
Refereed?: Yes
2. Samarasinghe, Nayanamana; Kapoor, Pranay; Mannan, Mohammad; Youssef, Amr. (2022). No salvation from trackers: Privacy analysis of religious websites and mobile apps. 16th DPM International Workshop on Data Privacy Management, ESORICS 2022 International Workshops. (13619): 1-16.
Accepted, Springer
Refereed?: Yes
3. ElSheikh, M; Youssef, A. (2022). Dispute-free Scalable Open Vote Network using zk-SNARKs. Financial Cryptography Workshops (WTSC 2022 : 6th Workshop on Trusted Smart Contracts). : 1-17.
Accepted, Springer
Refereed?: Yes
4. Elsheikh M, Youssef M. (2021). On MILP-based Automatic Search for Bit-Based Division Property for Ciphers with (large) Linear Layers. Baek , Ruj S. Proceedigs of the 26th Australasian Conference on Information Security and Privacy, ACISP 2021 (Acceptance rate 36/150). (13083): 111-131.
Published, Springer
Refereed?: Yes

5. Galal H, Youssef A. (2021). Publicly Verifiable and Secrecy Preserving Periodic Auctions. Financial Cryptography and Data Security. FC 2021 International Workshops. (12676): 348-363.
Published, Springer
Refereed?: Yes
6. Seifelnasr M, Galal H, Youssef A. (2020). Scalable Open-Vote Network on Ethereum. Financial Cryptography and Data Security. FC 2020 Workshops. (12063): 436-450.
Published, Springer
Refereed?: Yes
7. Tolba M*, EISheikh M*, Youssef A. (2020). Impossible Differential Cryptanalysis of Reduced-Round Tweakable TWINE. Progress in Cryptology - AFRICACRYPT 2020. (12174): 91-113.
Published, Springer
Refereed?: Yes
8. EISheikh M*, Youssef A. (2020). Integral Cryptanalysis of Reduced-Round Tweakable TWINE. Stephan K, Haya S, Serg V. 19TH INTERNATIONAL CONFERENCE ON CRYPTOLOGY AND NETWORK SECURITY (CANS 2020). (12579): 1-20.
In Press, Springer
Refereed?: Yes
9. Galal H, Youssef A. (2020). Preserving Netting Protocol for Inter-bank Payments. Proceeding of Data Privacy Management, Cryptocurrencies and Blockchain Technology. DPM 2020, CBT 2020. (12484): 319-334.
Published, Springer
Refereed?: Yes
10. Elsheikh M*, Youssef A. (2019). Related-key Differential Cryptanalysis of Full Round CRAFT. International Conference on Security, Privacy and Applied Cryptographic Engineering. Lecture Notes in Computer Science: 1-17.
In Press, Springer
Refereed?: Yes
11. Galal H*, Youssef A. (2019). Trustee: Full Privacy Preserving Vickrey Auction on top of Ethereum. Financial Cryptography and Data Security workshops (FC 2019). Lecture Notes in Computer Science(11599): 1-18.
In Press, Springer
Refereed?: Yes
12. EISheikh M*, Clark J, Youssef A. (2019). Deploying PayWord on Ethereum. Financial Cryptography and Data Security workshops (FC 2019). Lecture Notes in Computer Science(11599): 1-11.
In Press, Springer
Refereed?: Yes
13. Ali S*, Osman T*, Mannan M, Youssef A. (2019). On Privacy Risks of Public WiFi Captive Portals. Proceedings of ESORICS 2019 International Workshops, DPM 2019 and CBT 2019. Lecture Notes in Computer Science(11737): 1-18.
Accepted, Springer
Refereed?: Yes
14. Galal H*, Elsheikh M*, Youssef A. (2019). An Efficient Micropayment Channel on Ethereum. Proceedings of ESORICS 2019 International Workshops, DPM 2019 and CBT 2019. Lecture Notes in Computer Science(11737): 1-8.
In Press, Springer
Refereed?: Yes

15. Cabana O*, Youssef A, Debbabi M, Lebel B, Kassouf M, Agba L. (2019). Detecting, Fingerprinting and Tracking Reconnaissance Campaigns Targeting Industrial Control Systems. Detection of Intrusions and Malware, and Vulnerability Assessment. DIMVA 2019 (Acceptance Rate: 23/80). Lecture Notes in Computer Science(11564): 89-108.
Published, Springer
Refereed?: Yes
16. ElSheikh M*, Abdelkhalek A*, Youssef A. (2019). On MILP-Based Automatic Search for Differential Trails Through Modular Additions with Application to Bel-T. Buchmann J, Nitaj A, Rachidi T. Progress in Cryptology – AFRICACRYPT 2019 (Acceptance Rate: 22/53). Lecture Notes in Computer Science(11627): 273-296.
Published, Springer
Refereed?: Yes
17. Galal H*, Youssef A. (2018). Verifiable Sealed-Bid Auction on the Ethereum Blockchain. Financial Cryptography and Data Security Workshops (FC 2018). Lecture Notes in Computer Science(10958): 265-278.
Published, Springer
Refereed?: Yes
18. ElSheikh M*, Tolba M*, Youssef A. (2018). Integral Attacks on Round-Reduced Bel-T-256. Areas in Cryptography – SAC 2018 (Acceptance Rate 21/56). Lecture Notes in Computer Science(11349): 73-91.
Published, Springer
Refereed?: Yes
19. Tolba M*, Abdelkhalek A*., Youssef A. (2018). Multidimensional zero-correlation linear cryptanalysis of reduced round SPARX-128. Selected Areas in Cryptography – SAC 2017. SAC 2017 (Acceptance Rate: 23/66). Lecture Notes in Computer Science(10719): 423-441.
Published, Springer
Refereed?: Yes
20. Duman O*, Youssef A. (2018). Fault Analysis of the New Ukrainian Hash Function Standard: Kupyna. Foundations and Practice of Security. FPS 2018 (Acceptance Rate: 15/47). Lecture Notes in Computer Science(11358): 225-240.
Published, Springer
Refereed?: Yes
21. Abdelkhalek A*, Tolba M*, Youssef A. (2018). Recent trends in the cryptanalysis of block ciphers. Information Security: Foundations, Technologies and Applications. : 241-277.
Published, The Institution of Engineering and Technology (IET)
Refereed?: Yes
22. Galal H*, Youssef A. (2018). Succinctly Verifiable Sealed-Bid Auction Smart Contract. Data Privacy Management, Cryptocurrencies and Blockchain Technology. DPM 2018, CBT 2018.Lecture Notes in Computer Science(11025): 3-19.
Published, Springer
Refereed?: Yes

Conference Publications

1. Pagey, Rohan; Mannan, Mohammad; Youssef, Amr. (2023). All Your Shops Are Belong to Us: Security Weaknesses in E-commerce Platforms. The Web Conference 2023, (Acceptance rate 365/1900=19.2%), (1-11)
Paper
Accepted
Refereed?: Yes, Invited?: No

2. Baskaran, Supraja; Zhao, Lianying; Mannan, Mohammad; Youssef, Amr. (2023). Measuring the Leakage and Exploitability of Authentication Secrets in Super-apps: The WeChat Case. ACM. The 26th International Symposium on Research in Attacks, Intrusions and Defenses (RAID 2023) (Acceptance ratio 50/213)., Paper
Accepted
Refereed?: Yes, Invited?: No
3. Saber, Ahmad; Youssef, Amr; Svetinovic, Davor; Zeineldin,Hatem; El-Saadany, Ehab. (2023). Learning-Based Detection of Malicious Volt-VAr Control Parameters in Smart Inverters. IEEE. 49th Annual Conference of the IEEE Industrial Electronics Society (IES),, Paper
Accepted
Refereed?: Yes, Invited?: No
4. Tejaswi,Bhaskar; Mannan, Mohammad ; Youssef, Amr. (2023). All Your IoT Devices Are Belong to Us: Security Weaknesses in IoT Management Platforms. ACM. The 13th ACM Conference on Data and Application Security and Privacy (CODASPY 2023)., (1-7)
Paper
Accepted
Refereed?: Yes, Invited?: No
5. Afia, Ismail; Galal, Hisham; Al-Tawy, Riham; Youssef, Amr. (2023). vPass: Publicly Verifiable Fair Exchange Protocol for Vehicle Passports. IEEE. IEEE International Conference on Blockchain and Cryptocurrency, (ICBC 2023)., Paper
Accepted
Refereed?: Yes, Invited?: No
6. Naseri, Amir; Lucia, Walter; Youssef, Amr. (2023). An Observer-Based Key Agreement Scheme for Remotely Controlled Mobile Robots. 22nd World Congress of the International Federation of Automatic Control (IFAC 2023), Paper
Accepted
Refereed?: Yes, Invited?: No
7. Elbayoumi, Mohammed; Hamouda, Walaa ; Youssef, Amr. (2023). Machine-Type Communication in mmWave Ultra-Dense Networks: Performance Analysis. IEEE. IEEE International Conference on Communications (ICC 2023), (1-6)
Paper
Accepted
Refereed?: Yes, Invited?: No
8. Yu, X; Samarasinghe, N; Mannan, M; Youssef, A. (2022). Got Sick and Tracked: Privacy Analysis of Hospital Websites. IEEE. 2022 IEEE European Symposium on Security and Privacy Workshops (EuroS&PW), (278-286)
Paper
Published
Refereed?: Yes, Invited?: No
9. Samarasinghe; N., Adhikari, A., Mannan, M; Youssef, A. (2022). Et tu, brute? Privacy analysis of government websites and mobile apps. ACM. ACM Web Conference (WWW), Acceptance Rate=323/1822 (17.7%)., (564-575)
Paper
Accepted
Refereed?: Yes, Invited?: No

10. Naseri, Amir; Lucia, Walter ; Youssef, Amr. (2022). Encrypted Cloud-Based Set-Theoretic Model Predictive Control. 61st IEEE Conference on Decision and Control, (1-6)
Paper
Accepted
Refereed?: Yes, Invited?: No
11. Kapoor,Pranay ; Pagey, Rohan; Mannan , Mohammad ; Youssef, Amr. (2022). Silver Surfers on the Tech Wave: Privacy Analysis of Android Apps for the Elderly. 18th EAI International Conference on Security and Privacy in Communication Networks, (1-18)
Paper
Accepted
Refereed?: Yes, Invited?: No
12. Tejaswi, Bhaskar ; Samarasinghe, Nayanamana; Pourali, Sajjad; Mannan, Mohammad ; Youssef, Amr. (2022). Leaky Kits: The Increased Risk of Data Exposure from Phishing Kits. Symposium on Electronic Crime Research (eCrime 2022), BEST PAPER AWARD, (1-13)
Paper
Accepted
Refereed?: Yes, Invited?: No
13. Kluban, M; Mannan, M; Youssef, A. (2022). On Measuring Vulnerable JavaScript Functions in the Wild. ACM. Asia Conference on Computer and Communications Security, (917-930)
Paper
Published
Refereed?: Yes, Invited?: No
14. Elgharabawy, M; Kojusner, B; Mannan, M; Butler, K; Williams, B; Youssef, A. (2022). SAUSAGE: Security Analysis of Unix domain Socket usage in Android. IEEE. 2022 IEEE 7th European Symposium on Security and Privacy (EuroS&P), (572-586)
Paper
Published
Refereed?: Yes, Invited?: No
15. Naseri, Amir; Lucia, Walter; Youssef, Amr. (2022). A Privacy Preserving Solution for Cloud-Enabled Set-Theoretic Model Predictive Control. IEEE. the 20th European Control Conference (ECC 2022), (894-899)
Paper
Published
Refereed?: Yes, Invited?: No
16. Elbayoumi M, Hamouda W, Youssef A. (2021). Ergodic Secrecy Rate Analysis of Ultra-Dense Networks with Multiple Antennas. IEEE 2021 International Conference on Communications (ICC 2021): Wireless Communications Symposium,
Paper
In Press
Refereed?: Yes, Invited?: No
17. Abdelwahab A, Lucia W, Youssef A. (2021). Covert Channels in Cyber-Physical Systems. American Control Conference (ACC 2021),
Paper
In Press
Refereed?: Yes, Invited?: No

18. Uddin S, Mannan M, Youssef A. (2021). Horus: A Security Assessment Framework for Android Crypto Wallets. 17th EAI International Conference on Security and Privacy in Communication Networks (SecureComm 2021),
Conference Date: 2021/9
Paper
In Press
Refereed?: Yes, Invited?: No
19. Naseri A, Lucia W, Mannan M, Youssef A. (2021). On securing cloud-hosted cyber-physical systems using trusted execution environments. The IEE International Conference on Autonomous Systems (IEEE ICAS 2021),
Conference Date: 2021/8
Paper
In Press
Refereed?: Yes, Invited?: No
20. Nakkar M, Altawy R, Youssef A. (2021). Lightweight Authentication and Key Agreement Protocol for Edge Computing Applications (**First place student paper contest**). 7th IEEE World Forum on Internet of Things, WF-IoT 2021,
Conference Date: 2021/7
Paper
In Press
Refereed?: Yes, Invited?: No
21. Khan O, Youssef A, El-Saadany E, Salama M. (2021). LSTM-based approach to detect cyber attacks on market-based congestion management methods. IEEE PES General Meeting Conference 2021,
Conference Date: 2021/7
Paper
In Press
Refereed?: Yes, Invited?: No
22. Kluban M, Mannan M, Youssef A. (2021). On Measuring Vulnerable JavaScript Functions in the Wild. 17th ACM ASIA Conference on Computer and Communications Security (AsiaCCS 2022), (Acceptance Rate=26/169),
Conference Date: 2021/5
Paper
Accepted
Refereed?: Yes, Invited?: No
23. Elbayoumi M*, Hamouda W*, Youssef A. (2020). Secrecy Performance in Ultra-Dense Networks with Multiple Associations. IEEE. IEEE GLOBECOM 2020 Workshop on 5G and Beyond Wireless Security, 2020., (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
24. Ali S*, Elgharabawy M*, Duchaussoy Q*, Mannan M, Youssef A. (2020). Betrayed by the Guardian: Security and Privacy Risks of Parental Control Solutions,. ACM. The 2020 Annual Computer Security Applications Conference (ACSAC 2020), ACM, Acceptance Rate(70/302=23%) Distinguished Paper Award.,
Conference Date: 2020/12
Paper
In Press
Refereed?: Yes, Invited?: No

25. Elbayoumi M*, Hamouda W, Youssef A. (2020). A Hybrid NOMA/OMA Scheme for MTC in Ultra-Dense Networks. IEEE. IEEE Global Communications Conference (GLOBECOM 2020), (1-5)
Conference Date: 2020/12
Paper
In Press
Refereed?: Yes, Invited?: No
26. Abdelwahab A*, Lucia W, Youssef A. (2020). Decoy-Based Moving Target Defense Against Cyber-Physical Attacks on Smart Grid. IEEE. IEEE Canada Electrical Power and Energy Conference (EPEC 2020)., (1-5)
Conference Date: 2020/11
Paper
In Press
Refereed?: Yes, Invited?: No
27. Seifelnasr M*, Nakkar M*, AITawy R, Youssef A. (2020). A Lightweight Authentication and Inter-cloud Payment Protocol for Edge Computing. IEEE. IEEE International Conference on Cloud Networking (CloudNet2020), (1-4)
Conference Date: 2020/11
Paper
Published
Refereed?: Yes, Invited?: No
28. Stobert E, Safaie T*, Molyneaux H, Mannan M, Youssef A. (2020). ByPass: Reconsidering the Usability of Password Managers. Springer. 16th EAI International Conference on Security and Privacy in Communication Networks (SecureComm 2020), (1-21)
Conference Date: 2020/10
Paper
In Press
Refereed?: Yes, Invited?: No
29. Abdelwahab A*, Lucia A, Youssef A. (2020). Set-Theoretic Control for Active Detection of Replay Attacks with Applications to Smart Grid. IEEE. 4th IEEE Conference on Control Technology and Applications, 2020., (1-5)
Conference Date: 2020/8
Paper
In Press
Refereed?: Yes, Invited?: No
30. Abdelwahab A*, Lucia W, Youssef A. (2020). A DoS-resilient Set-Theoretic Controller for Smart Grid Applications. IEEE. IEEE PES General Meeting Conference 2020., (1-5)
Conference Date: 2020/8
Paper
In Press
Refereed?: Yes, Invited?: No
31. Gul O*, El-Saadany E, Youssef A, Shaaban M. (2019). Impact of Electric Vehicles Botnets on the Power Grid. IEEE. IEEE Canada Electrical Power and Energy Conference (EPEC 2019), (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No

32. Albarakati A*, Robillard C*, Karanfil M*, Kassoufy M, Hadjidj R, Debbabi M, Youssef A. (2019). Security Monitoring of IEC 61850 Substations Using IEC 62351-7 Network and SystemManagement. IEEE. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), (1-6)
Paper
Accepted
Refereed?: Yes, Invited?: No
33. Khan O*, El-Saadany E, Saleh K, Shaaban M, Youssef A. (2019). Cyber Attacks On Distributed Congestion Management Methods. IEEE. IEEE Powe and Energy Society (PES) General Meeting Conference, (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
34. Khalaf M*, Youssef A, El-Saadany E, Salama M. (2019). Detection of False Data Injection Attacks on Wide-Area Under-Frequency Load Shedding Protection Schemes. IEEE. IEEE Canada Electrical Power and Energy Conference (EPEC 2019), (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
35. Osman T*, Mannan M, Hengartne Ur, Youssef A. (2019). AppVeto: MobileApplication Self-Defense through Resource Access Veto. ACM. The 2019 Annual Computer Security Applications Conference (ACSAC 2019) (Acceptance Rate: 60/266), (1-11)
Paper
Accepted
Refereed?: Yes, Invited?: No
36. Elbayoumi M*, Kamel M*, Hamouda W*, Youssef A. (2019). Capacity Analysis of Downlink NOMA-Based Coexistent HTC/MTC in UDN. IEEE. International Conference on Communications, Signal Processing, and their Applications (ICCSPA 2019) (Best Paper Award), (1-6)
Paper
Published
Refereed?: Yes, Invited?: No
37. Kamel M*, Hamouda W, Youssef A. (2018). Uplink Coverage of Machine-Type Communications in Ultra-Dense Networks. IEEE. IEEE Global Communications Conference (GLOBECOM), (1-6)
Paper
Published
Refereed?: Yes, Invited?: No
38. Mahmoud M*, Hossen Z*, Barakat H*, Mannan M, Youssef A. (2018). Towards a comprehensive analytical framework for smart toy privacy practices. ACM. 7th Workshop on Socio-Technical Aspects in Security and Trust. (Best Paper Award), (64-75)
Paper
Published
Refereed?: Yes, Invited?: Yes
39. Khalaf M*, Youssef A, El-Saadany E. (2018). A Particle Filter-Based Approach for the Detection of False Data Injection Attacks on Automatic Generation Control Systems. IEEE. IEEE Electrical Power and Energy Conference (EPEC), (1-6)
Paper
Published
Refereed?: Yes, Invited?: No

40. Ayad A*, Farag H, Youssef A, El-Saadany E. (2018). Detection of false data injection attacks in smart grids using recurrent neural networks. IEEE. IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT 2018), (1-5)
Paper
Published
Refereed?: Yes, Invited?: No
41. Waked L*, Mannan M, Youssef A. (2018). To intercept or not to intercept: Analyzing tls interception in network appliances. ACM. Asia Conference on Computer and Communications Security (ASIACCS 2018) (Acceptance Rate: 62/310), (399-412)
Paper
Published
Refereed?: Yes, Invited?: No
42. Albarakati A*, Moussa B, Debbabi M, Youssef A, Agba B, Kassouf M. (2018). OpenStack-Based Evaluation Framework for Smart Grid Cyber Security. IEEE. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), (1-6)
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Licenses

1. Professional Engineer, Ontario
Granted
Date Issued: 2005/12



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Professor Yong Zeng

Correspondence language: English

Contact Information

The primary information is denoted by (*)

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Primary Affiliation (*)

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Professor Yong Zeng

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	No	No	No	No	No

Degrees

- 2001/11 Doctorate, Design Theory and Methodology, The University of Calgary
Supervisors: Peihua Gu, 1998/5 - 2001/7
- 1992/8 Doctorate, Finite Element Modeling, Dalian University of Technology
Supervisors: Gengdong Cheng, 1989/9 - 1992/7
- 1989/9 Master's Thesis, Finite Element Modeling, Dalian University of Technology
Supervisors: Gengdong Cheng, 1986/9 - 1989/7
- 1986/7 Bachelor's, Structural Engineering, Logistical Engineering University
Supervisors: Shengkun Wang, 1986/2 - 1986/7

Recognitions

- 2021/2 Fellow
The International Society for the Study of Creativity and Innovation
Distinction
Internationally leading researchers were nominated by one society fellow and approved by the board of directors of the society.
- 2017/1 - 2020/6 NSERC Chair in Aerospace Design Engineering
Natural Sciences and Engineering Research Council of Canada (NSERC)
Prize / Award
The core objective of the NSERC Chair in Aerospace Design Engineering (NCADE) is to increase the quality and quantity of Concordia University's engineering graduates prepared for employment as design engineers in Canada's aerospace industry. The research program focuses on research activities in the design and development of processes and methodologies that can deliver the right product at the right time in the unique context of the aerospace industry.

User Profile

Research Specialization Keywords: Behaviour change, conceptual design, design creativity, design methodology, design science, design theory, experimental approach, formal approach, human factors engineering,

neurocognitive science, nonparametric clustering, Policy design, reinforcement learning, requirements engineering, software engineering

Employment

2010/6	Professor Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University Full-time Tenure Status: Tenure
2003/8 - 2010/5	Associate Professor Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University Full-time Tenure Status: Tenure
2002/2 - 2003/7	Research Associate Integrated Manufacturing Technologies Institute, National Research Council Canada
2001/7 - 2002/1	Postdoctoral Fellow or Associate Mechanical & Manufacturing Engineering, Faculty of engineering, The University of Calgary Full-time Tenure Status: Non Tenure Track

Research Funding History

Awarded [n=5]

2021/4 - 2025/3 Co-applicant	Generating EMR-Based Algorithms to Identify Hospital Adverse Events for Health System Performance Evaluation and Improvement, Grant Funding Sources: Canadian Institutes of Health Research (CIHR) Project Grant Total Funding - 1,189,576 Portion of Funding Received - 200,000 Funding Competitive?: Yes Co-applicant : Catherine Ann Eastwood; Principal Applicant : Yuan Xu
2019/4 - 2024/3 Principal Applicant	AdaptiveCAD: Shifting CAD Paradigm for Innovative and Creative Design, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 230,000 Portion of Funding Received - 100 Funding Competitive?: Yes
2022/4 - 2024/3 Principal Investigator	Optimizing workload assignment to overcome workplace procrastination, Grant Funding Sources: Concordia University OVPRGS/Team Grant Total Funding - 50,000 Portion of Funding Received - 50,000

	Funding Competitive?: Yes
2020/9 - 2023/8 Principal Investigator	AI + Waste to Resources Management toward Sustainable City, Grant Funding Sources: Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) NSFC-FQR Total Funding - 120,000 Portion of Funding Received - 60,000 Funding Competitive?: Yes Co-investigator : Jun Yan; Nadia Bhuiyan
2022/2 - 2023/1 Co-applicant	Make healthy changes easy: AI-enabled dialogue-driven app for personalized cancer prevention – risk dialogue, Grant Funding Sources: Canadian Cancer Society CCS/CIHR Action Grants Total Funding - 200,000 Portion of Funding Received - 93,750 Funding Competitive?: Yes
Completed [n=7]	
2018/3 - 2021/2 Principal Investigator	Biometric Approaches to Inferring Pilot Trainee's Affective and Cognitive States, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) CRD Total Funding - 1,171,800 Portion of Funding Received - 540,800 Funding Competitive?: Yes Co-applicant : Jocelyn Faubert; Susanne Lajoie; Collaborator : Ali Akgunduz; Weiping Zhu
2015/7 - 2020/6 Co-investigator	NSERC Design Chair in Aerospace Design Engineering, Research Chair Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) CDE Total Funding - 2,425,000 Portion of Funding Received - 436,000 Funding Competitive?: Yes
2014/5 - 2019/4 Principal Investigator	Environment-Based Design Methodology for Creative Design, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) DG Total Funding - 120,000 Portion of Funding Received - 120,000 Funding Competitive?: Yes
2014/5 - 2019/4 Co-investigator	Lean Aerospace Value Streams, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) CRD Total Funding - 1,020,000

Portion of Funding Received - 258,720

Funding Competitive?: Yes

Co-applicant : Christian Mascle; K Demirli; Yvan Beauregard;

Principal Applicant : Nadia Bhuiyan

2018/6 - 2018/9

Principal Investigator

Environment-Based Design (EBD) Application to Mechanical Products, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

GlobLink

Total Funding - 6,000

Portion of Funding Received - 6,000

Funding Competitive?: Yes

2018/7 - 2018/9

Principal Investigator

Measurement of Student Competencies in a Teamwork, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

GlobLink

Total Funding - 6,000

Portion of Funding Received - 6,000

Funding Competitive?: Yes

2018/3 - 2018/9

Principal Investigator

Improvement of Valtech Workflow: A Pilot Study, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Engage

Total Funding - 25,000

Portion of Funding Received - 25,000

Funding Competitive?: Yes

Student/Postdoctoral Supervision

Bachelor's [n=2]

2018/6 - 2018/8

Principal Supervisor

Jeremy Weng (Completed) , University of Virginia

Thesis/Project Title: Website Development

Present Position: Software developer, A government organization of US in Washington DC

2018/5 - 2018/9

Principal Supervisor

Mumu Gloria Wang (Completed) , Concordia University

Thesis/Project Title: Humor and Creative Design

Present Position: Student, Concordia University

Master's Thesis [n=17]

2023/1 - 2024/12

Principal Supervisor

Jiami Yang (In Progress) , Concordia University

Student Degree Expected Date: 2024/4

Thesis/Project Title: Behaviour change framework: TASKS

Present Position: Master's student, Concordia University

2022/9 - 2024/8

Co-Supervisor

Christopher Neves (In Progress) , Concordia University

Student Degree Expected Date: 2024/8

Thesis/Project Title: GNN for analyzing EEG signals

Present Position: Master's student, Concordia University

- 2021/9 - 2023/8
Principal Supervisor Amin Bayatpour (In Progress) , Concordia University
Thesis/Project Title: Natural language processing
Present Position: Master's student, Concordia University
- 2019/9 - 2021/8
Co-Supervisor Shohre Khoddami (Completed) , Concordia University
Thesis/Project Title: A System Dynamics Approach to Comparative Analysis of Biomass Supply Chain Coordination Strategies
Present Position: Project management specialist- Project Planner, GE Renewable Energy
- 2019/7 - 2021/9
Principal Supervisor Yanxin Yao (Completed) , Concordia
Thesis/Project Title: Biometric measurement of operator's cognitive states
Present Position: Software developer, A company in China
- 2018/9 - 2020/9
Principal Supervisor Jamil Reza Chowdhury (Completed) , Concordia University
Thesis/Project Title: Algorithms to Remove EEG Artifacts
Present Position: Software developer, J Morgan
- 2018/5 - 2019/9
Principal Supervisor Chang Su (Completed) , Concordia University
Thesis/Project Title: EEG Expressions of Designer's Gestures and Body Movements in Conceptual Design Process
Present Position: PhD Student, Concordia University
- 2017/9 - 2019/9
Co-Supervisor Shixuan Hou (Completed) , Concordia University
Thesis/Project Title: A Dynamic Two-Sided Matching Algorithm in a Changing Labour Market
Present Position: PhD Student, Concordia University
- 2017/9 - 2019/9
Principal Supervisor Yuyang Shi (Completed) , Concordia University
Thesis/Project Title: A Service Design Framework Based on EBD and TRIZ
Present Position: Quality engineering, A company in Beijing
- 2017/9 - 2021/1
Principal Supervisor Alexandra Milkin (Completed) , Concordia University
Thesis/Project Title: EBD Enabled Requirements Modeling for New Product Development in Aerospace Design
Present Position: Quality specialist, KS2 Corp
- 2017/1 - 2019/8
Co-Supervisor Seyed Reza Razavi (Completed) , Concordia University
Thesis/Project Title: Analysis of Product Evolution Using EBD
Present Position: Quality manager, An engineering company in Montreal
- 2016/9 - 2018/12
Principal Supervisor Amir Ali Ommi (Completed) , Concordia University
Thesis/Project Title: Designing the Design Team
Present Position: Senior Product Manager, Paper Edu
- 2016/5 - 2018/4
Principal Supervisor Dalvir Singh (Completed) , Concordia University
Thesis/Project Title: To Investigate Power of Brain Activity Using EEG Comparison Between Creative and Non-creative Design Task
Present Position: Technician, ROOT Data Center, Montreal
- 2016/5 - 2018/8
Principal Supervisor Shahryar Taheri (Completed) , Concordia University
Thesis/Project Title: Investigation of Assessment Methods for Measuring the Effectiveness of Student Design Learning
Present Position: Unknown
- 2015/5 - 2017/4
Principal Supervisor Lixin Liu (Completed) , Concordia University
Thesis/Project Title: Investigation into Neurological Foundation of Synthesis and Evaluation Activities in Conceptual Design
Present Position: Consultant, Montreal

2015/1 - 2017/8 Principal Supervisor	Mengli Shu (Completed) , Concordia University Thesis/Project Title: Quality Function Deployment Integration with Design Methodologies Present Position: IT consultant, Morgan Stanley, Montreal
2014/9 - 2017/4 Principal Supervisor	Yi Dou (Completed) , Concordia University Thesis/Project Title: Artifact Analysis and Removal of Electroencephalographic (EEG) Recordings Present Position: RA, Central China Normal University
Doctorate [n=14]	
2022/1 - 2025/5 Principal Supervisor	Morteza Zangeneh Soroush (In Progress) , Concordia University Thesis/Project Title: EEG analysis of creative activities Present Position: PhD student, Concordia University
2022/1 - 2025/4 Principal Supervisor	Hamed Shirazi (In Progress) , Concordia University Thesis/Project Title: Behaviour design to overcoming procrastination Present Position: PhD student, Concordia University
2021/9 - 2024/12 Co-Supervisor	Rupinder Kaur (In Progress) , Concordia University Thesis/Project Title: EBD driven education design Present Position: PhD student, Concordia University
2021/9 - 2024/8 Principal Supervisor	Jinli Yao (In Progress) , Concordia University Thesis/Project Title: Nonparametric clustering Present Position: PhD student, Concordia University
2021/9 - 2024/12 Principal Supervisor	Ali Mohammadi (In Progress) , Concordia University Thesis/Project Title: Design methodology for innovative design Present Position: PhD student, Concordia University
2020/9 - 2023/8 Principal Supervisor	Chang Su (In Progress) , Concordia University Thesis/Project Title: Quantification of mental stresses in complex cognitive activities Present Position: PhD student, Concordia University
2020/1 - 2023/12 Co-Supervisor	Hamed Jafarpour (In Progress) , Concordia Thesis/Project Title: Machine learning algorithms to identify adverse events from EMRs Present Position: PhD student
2018/9 - 2022/8 Principal Supervisor	Cheligeer (Completed) , Concordia University Thesis/Project Title: An EBD-enabled design knowledge acquisition framework Present Position: Senior Data Scientist, Alberta Health Services
2018/9 - 2022/2 Principal Supervisor	Hongyi Cao (Completed) , Concordia University Thesis/Project Title: A design science enabled organizational capability state measurement approach Present Position: Research scientist, China Ministry of Environment and Ecosystems
2017/1 - 2022/12 Principal Supervisor	Mengting Zhao (Completed) , Concordia University Thesis/Project Title: Capability zone and equilibrium in task accomplishment Present Position: Postdoctoral fellow, Concordia University
2016/9 - 2021/8 Principal Supervisor	Jie Pan (In Progress) , Concordia University Student Degree Expected Date: 2021/11 Thesis/Project Title: Rule-based machine learning algorithms for smart automatic quadrilateral mesh generation system Present Position: Postdoctoral Fellow, Center for Health Informatics, University of Calgary

- 2016/9 - 2020/8
Principal Supervisor Wenjun Jia (Completed) , Concordia University
Thesis/Project Title: Investigating neurocognition in design creativity under loosely controlled experiments supported by EEG microstate analysis
Present Position: Researcher, Lingang Laboratory, Shanghai, China
- 2014/9 - 2017/4
Principal Supervisor Philon Nguyen (Completed) , Concordia University
Thesis/Project Title: Approaches to Quantifying EEG Features for Design Protocol Analysis
Present Position: President/Consultant, Qtech, Montreal
- 2010/9 - 2017/4
Principal Supervisor Suo Tan (Completed) , Concordia University
Thesis/Project Title: Roles of Perception in Engineering Design – A Theoretical Foundation to Improve Designer’s Performance
Present Position: Business Intelligence Developer, Playtika (Canada), Montreal

Post-doctorate [n=1]

- 2021/11 - 2022/10
Principal Supervisor Jie Pan (Completed) , Concordia
Thesis/Project Title: Unsupervised learning
Present Position: Postdoctoral Fellow, Center for Health Informatics, University of Calgary

Certificate [n=8]

- 2018/4 - 2018/6
Principal Supervisor Margarita Tinoco (Completed) , Lester B. Pearson Center
Thesis/Project Title: Website Development
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Wenxin Ma (Completed) , Lester B. Pearson Center
Thesis/Project Title: Website Development
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Maria Rotaru (Completed) , Lester B. Pearson Center
Thesis/Project Title: Website Development
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Eom Chung Yong (Completed) , Lester B. Pearson Center
Thesis/Project Title: Website Development
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Kwang Ho Kim (Completed) , Lester B. Pearson Center
Thesis/Project Title: AI Linguistic Model & software test
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Bo Zhang (Completed) , Lester B. Pearson Center
Thesis/Project Title: IT Market Modeling
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Hua Hin Ho (Completed) , Lester B. Pearson Center
Thesis/Project Title: Website Development
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Miyuki Matsuzaki (Completed) , Lester B. Pearson Center
Thesis/Project Title: AI Linguistic Model & Software Test
Present Position: Recently graduated

Research Associate [n=4]

- 2023/9 - 2023/12 Nicholas Derby, McGill University
Principal Supervisor Thesis/Project Title: Measuring human cognitive workload to overcome workplace procrastination
Present Position: Research Associate, Concordia University
- 2018/5 - 2019/4 Lucas House (Completed) , Concordia University
Principal Supervisor Thesis/Project Title: Cognitive Science
Present Position: Ph.D. Student, UQAM / Partime RA, Concordia University
- 2018/1 - 2019/4 Yi Dou (Completed) , Concordia University
Principal Supervisor Thesis/Project Title: EEG Signal Processing
Present Position: RA, Concordia University
- 2018/1 - 2018/12 Lixin Liu, Concordia University
Principal Supervisor Thesis/Project Title: Improvement of Valtech Workflow: A Pilot Study
Present Position: RA, Concordia University

Event Administration

- 2023/1 - 2024/8 Organization Chair, Eleventh International Conference on Design Computing and Cognition, Conference, 2024/7 - 2024/7
- 2022/8 - 2023/3 Chair of Steering Committee, International Workshop of the Society of Design and Process Science - SDPS 2023, Workshop, 2023/2 - 2023/2
- 2017/11 - 2018/8 Conference Chair, Design Science Research (DSR) 2018: Workshop on Data Driven Design and Learning, August 23 – 25, 2018, Montréal, Canada, Workshop, 2018/8 - 2018/8

Editorial Activities

- 2022/9 - 2027/8 Associate Editor, Journal of Engineering Design, Journal
- 2020/9 - 2023/8 Associate Editor, Artificial Intelligence in Engineering Design, Analysis and Manufacturing, Journal
- 2014/1 - 2018/11 Editorial Board Member, Journal of Computational Design and Engineering, Journal
- 2012/1 - 2018/11 Editor-in-Chief, Transactions of SDPS: Journal of Integrated Design and Process Science, Journal
- 2011/10 - 2018/11 Editorial Board Member, Computers in Industry, Journal

International Collaboration Activities

- 2017/9 - 2018/12 Executive Director, Concordia-CCNU Joint Center, Montréal, Canada and Wuhan, China
Established the Concordia-CCNU Joint Research Centre for Teaching & Learning Design.
Jointly organized Design Science Research 2018. Co-supervising a PhD student on education design based on EBD proposed by the applicant. Helping the faculty members at CCNU apply the theory developed by the applicant.

Presentations

1. (2018). Keynote Speaker - Language, Cognition and Design: a Neuro-cognitive Approach. International Symposium on Cognitive Neural Mechanism of Language, RIZHAO, China, Dec. 14-16, 2018, China
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
2. (2018). Keynote Speaker - How Can an Emotional Brain be Rationally Creative?. TMCE 2018, May 7-11, 2018, Las Palmas de Gran Canaria, Spain
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
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Invited?: Yes, Keynote?: Yes
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Invited?: Yes, Keynote?: Yes
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Paper
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Appendix 9: List of External Experts Who Supported the Proposal by Providing Detailed Feedback in the Survey

We did not ask for support letters from the industry. We took a more data-driven approach by asking industry experts to complete a comprehensive survey for us. We reached out to 39 industry experts through CIIS faculty networks. These professionals represent a broad range of sectors such as technology consulting, telecommunications, finance, utilities, and healthcare, and hold varied roles from executive to technical specialists. Their collective input directly informs the industry-focused orientation of our curriculum. The following is the list of industry experts who supported the proposal by providing detailed feedback in the survey. Detailed survey results can be found in Appendix 5.

Name	Current job title	Organization	Core responsibilities
Subhashish Chakravarty	Sr Eng Manager	Collins Aerospace	Engineering management and research
Alireza Arasteh	Head of Canada	Mandiant Consulting	Management
Bassam	Researcher	HQ	research and project management
Aurelian Constantinescu	Project Manager, Collaboration and Government Programs, and Academic Partnerships	CAE Inc.	Project management
Mohammad Faghani	Director of Managed Detection and Response	Accenture	Provide Managed Detection and Response services to clients
Steven Wang	Sr Director	Mistplay	Leadership of engineering teams
Boubakr	Researcher	Ericsson	R7D
CASAMIA	CEO	CREANCES ET SOLUTIONS	
Remi Benito	Aircraft Cybersecurity	Bombardier	Engineering
Makan Pourzandi	Research Leader	Ericsson	Research
Warren Lee	Cybersecurity Leadership - GRC	Pratt and Whitney	Governance Risk and Compliance
Yosr Jarraya	Master Researcher	Ericsson	Research
Ribal Atallah	Cybersecurity Researcher	Hydro-Québec	project manager, cybersecurity research, AI research
Marthe Kassouf	Researcher	Hydro-Quebec	Project management and research
Bin Li	Senior Software Engineer	YMAX Communications Corp	Engineering
chen kuang	tech lead	Bell Flight	engineering

Name	Current job title	Organization	Core responsibilities
Heyang Zhao	Cybersecurity Specialist	Alstom	engineering
Plamen Hristov	Sr. Manager Internal Audit	CN Rail	management
Jerry Xiao	Manager	RdQCC LLC	Management
Julian Conte	Product Manager	Creo Solutions	Management, coordination, defining vision
Eric Chung	Manager	CAE Inc	Engineering Management
Andrée Robichaud-Véronneau	Senior Data Scientist	Ciena Corporation	Engineering
Olivier Henley	Embedded Engineer	Adacore	Emerging Markets
Layial El-Hadi	Executive Director	Fintech Cadence	Management
George Mastromonaco	V.P. Sales & Marketing	Ingenia Technologies Inc.	Sales Force Management and Product Manager
Will Edwards	Head of Cyber Services	SEL	Cyber Engineering
Fayi Zhou	Manager	EPCOR	Engineering plus Management
Hyame Alameddine	Senior Security Researcher	Ericsson	Security research
Marc-André Guérette	Director of Information Security	Rheinmetall Canada	Management
Aram Montazami	VP of R&D	Novatek International	Management of all R&D projects and teams
Wissem Maazoun	Vice-President of Innovation	BusPas Inc.	Engineering, Research
Umang Handa	Partner, National Leader, Cybersecurity as a Service	PwC	Lead Cyber as a Service for PwC Canada, Nationally
Hui Zhu	Research Scientist	Thales Group	Research and development
Mohamad El Hout	Founder	Houtech Consulting	Security consulting and headhunting
Marc Potvin	Project Engineer	Bba Inc.	Engineering
Luis Suárez	Researcher	Ericsson Research	Research 5G, 6G trust management
Patrick Jean-Baptiste	President	Sunphinx	Management
Roberto Pimentel	Director, Software Engineering	Raymond Chabot Grant Thornton	Engineering management + Software Research and Development
Danial Jafarigiv	Cybersecurity Researcher	Hydro-Quebec Research Institute (IREQ)	Research



**SENATE
OPEN SESSION
Meeting of May 17, 2024**

AGENDA ITEM: Academic Programs Committee recommendation: New program: BSc in Cybersecurity (GCS-CIISE-5566)

ACTION REQUIRED: For approval

SUMMARY: Senate is being asked to approve a new program - BSc in Cybersecurity (GCS-CIISE-5566)

BACKGROUND:

The Gina Cody School of Engineering and Computer Science (GCS) would like to offer a Bachelor of Science program in Cybersecurity ("BSc Program"). This initiative is led by the Concordia Institute for Information Systems Engineering (CIISE), which has recognised expertise in cybersecurity.

This BSc Program is for students seeking a targeted education in cybersecurity that can be completed in a shorter timeframe. Compared with the Bachelor of Engineering program, the BSc Program 1) does not include the extensive engineering training provided by the engineering core courses; 2) requires a much smaller set of cybersecurity core courses (50% of that of bachelor of engineering), which makes it a perfect fit for those who may already have some information technology experience or education and are looking to upskill, as well as those eager to dive quickly into cybersecurity careers, including roles that require a deep, but less broad, understanding of the field. This program complements the broader Bachelor of Engineering option by providing an alternative pathway that is more focused and expedited.

The program was approved by the Academic Programs Committee on April 25, 2024.

DRAFT MOTION:

That, on recommendation of the Academic Programs Committee, Senate approve the new program Bachelor of Science in Cybersecurity (GCS-CIISE-5566), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate

Date: May 7, 2024

**ACADEMIC PROGRAMS COMMITTEE
REPORT TO SENATE
Sandra Gabriele, PhD
April 25, 2024**

The Academic Programs Committee requests that Senate consider the following changes for the Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposal be forwarded to Senate for approval:

Undergraduate Curriculum Proposals (Changes for the 2025-26 Calendar)

Gina Cody School of Engineering and Computer Science

Concordia Institute for Information Systems Engineering
GCS-CIISE-5564; **APC-2024-2-D1**

- New Program: BEng in Cybersecurity Engineering

GCS-CIISE-5566; **APC-2024-2-D2**

- New Program: BSc in Cybersecurity

Graduate Curriculum Proposals (Changes for the 2024-25 Calendar)

Faculty of Arts and Science

Department of Education
AS-EDUC-5510; **APC-2024-3-D1**

- New Program: Graduate Diploma in Teacher Certification (For January 2025 Implementation)

Faculty of Fine Arts

Department of Art History
FA-ARTH-5506; **APC-2024-3-D2** (For September 2025 Implementation)

- New Program: Graduate Certificate in Curatorial Studies and Practices

FA-ARTH-5507; **APC-2024-3-D3** (For September 2025 Implementation)

- New Program: Microprogram in Curatorial Studies



Sandra Gabriele, PhD
Vice-Provost, Innovation in Teaching and Learning
April 25, 2024

Summary and Rationale for Changes

The Gina Cody School of Engineering and Computer Science (GCS) would like to offer an undergraduate program in Cybersecurity. This initiative is led by the Concordia Institute for Information Systems Engineering (CIISE), which has recognised expertise in cybersecurity.

Program Rationale

Cybercrime has reached unprecedented levels in recent years. Currently, Canada employs approximately 124,000 cybersecurity professionals but urgently requires an additional 25,000, leaving one in six positions unfilled. This gap represents one of the country's biggest challenges in the digital economy. Our industry expert survey revealed an urgent need for a dedicated bachelor's program in cybersecurity. This need is further supported by the keen interest expressed by a large number of students in our surveys conducted among CEGEP and GCS undergraduate students. Among those who responded with strong interest in pursuing a bachelor's degree in cybersecurity, around 50% of them intend to take the BSc option.

Our environmental scan also revealed noticeable gaps in existing educational offerings, indicating an opportune moment for new programs in cybersecurity. While Canada offers a variety of diplomas, certificates, and advanced degrees in cybersecurity, there are only four dedicated bachelor's programs in the field. Of these, two programs in Quebec universities are cumulative, designed for IT professionals with an emphasis on certificate training. The other two, offered by Ontario colleges, focus on particular tools and platforms, providing limited breadth in cybersecurity theories and methodologies.

What Distinguishes the Proposed BSc

Compared to other similar programs, our BSc program has much broader coverage of different aspects of cybersecurity and cutting-edge cybersecurity technologies. In addition to hands-on experiences, the design of our courses also equips students with a deeper understanding of the subject matters at theory level, empowering students to develop their understanding and skills with the evolution of the technologies and challenges in the field. Moreover, our program offers integrated co-op programs starting from the beginning of the program, which will be among the very first such programs offered in Quebec and in Canada. Other dedicated BSc programs offered in Quebec and Canada don't offer co-op options except for the BSc program offered by Seneca College in Ontario.

Target Audience

The BSc program is ideal for students seeking a targeted education in cybersecurity that can be completed in a shorter timeframe. Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) requires a much smaller set of cybersecurity core courses (50% of that of BEng), which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into cybersecurity careers, including roles that require a deep, but less broad, understanding of the field. This program complements the broader BEng option by providing an alternative pathway that is more focused and expedited.

The program will appeal to students looking for jobs that do not require professional engineer designations, such as cybersecurity analysts, security/network/system administrators, and security specialists in cloud/database/software, among others.

As a comprehensive program covering all theoretical foundations of cybersecurity, the BSc program will also appeal to students who plan to apply for graduate schools directly after obtaining the Bachelors; In addition, the BSc program can also attract students in, e.g., Electrical Engineering, Computer Engineering,

Computer Science, and Software Engineering who are interested in taking cybersecurity as a minor or double major.

The Concordia University Advantage

Concordia University boasts a strong research capacity in cybersecurity, featuring one of Canada's largest academic teams focused on the field. The Security Research Center (SRC) at Concordia hosts 13 faculty members, 4 industry research chairs, 30 PhD candidates, and 30 master's students dedicated to cybersecurity projects. Since 2005, Concordia has been offering two specialized master's programs in cybersecurity and a PhD program in Information and Systems Engineering. With these extensive resources and established expertise, CIISE is well-equipped to deliver a high-quality BSc program to meet the expectations of students, industry, and society.

Implementation and Financial Viability

Slated for launch in September 2025, the BSc program is expected to attract a steady stream of applicants due to the long-term industry growth projections. Most of the resources needed to implement the program are already available within the CIISE and Gina Cody School of Engineering and Computer Science. We are also applying for a twin bachelor's degree program: BEng in Cybersecurity. The courses and labs will be shared by these two programs. We are not requesting new tenure track positions nor new lab spaces to make the program fully operational. The proposed program is expected to yield a positive surplus for the University from the first year of its operation.

Resource Implications

The budget for the BSc in Cybersecurity BSc can be found in the Supporting Documents.

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 17 May 2024

Approved by:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 19 Mar 2024

Following approval of the Faculty Councils, APC members reviewed the curriculum submission

GCS-CIISE-5566; APC-2024-2-D2.

As a result of discussions, APC resolved that GCS-CIISE-5566; APC-2024-2-D2 be forwarded to Senate for approval.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
APC, 19 Mar 2024

Approved by:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 23 Feb 2024

Summary of Committee Discussion: Faculty Curriculum Approval (FCC/FAPC)

For Submission to:

Mourad Debbabi, Dean, Gina Cody School of Engineering and Computer Science,
GCS Council, 23 Feb 2024

Approved by:

Ali Akgunduz, Associate Dean (Academic Programs),
ESC Undergraduate Studies Committee, 19 Feb 2024

Summary of Committee Discussion: Department approval

For Submission to:

Ali Akgunduz, Associate Dean (Academic Programs and Accreditation),
Engineering and Computer Science Undergraduate Studies Committee, 19 Feb 2024

Approved by:

Chun Wang, Director, Concordia Institute for Information Systems Engineering,
CIISE Department Council, 17 Jan 2024

New Program Proposal: B.Sc. in Cybersecurity Engineering

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1. EXECUTIVE SUMMARY

The Gina Cody School of Engineering and Computer Science (GCS) would like to offer an undergraduate program in Cybersecurity. This initiative is led by the Concordia Institute for Information Systems Engineering (CIISE), which has recognised expertise in cybersecurity.

Program Rationale

Cybercrime has reached unprecedented levels in recent years. Currently, Canada employs approximately 124,000 cybersecurity professionals but urgently requires an additional 25,000, leaving one in six positions unfilled. This gap represents one of the country's biggest challenges in the digital economy. Our industry expert survey revealed an urgent need for a dedicated bachelor's program in cybersecurity. This need is further supported by the keen interest expressed by a large number of students in our surveys conducted among CEGEP and GCS undergraduate students. Among those who responded with strong interest in pursuing a bachelor's degree in cybersecurity, around 50% of them intend to take the BSc option.

Our environmental scan also revealed noticeable gaps in existing educational offerings, indicating an opportune moment for new programs in cybersecurity. While Canada offers a variety of diplomas, certificates, and advanced degrees in cybersecurity, there are only four dedicated bachelor's programs in the field. Of these, two programs in Quebec universities are cumulative, designed for IT professionals with an emphasis on certificate training. The other two, offered by Ontario colleges, focus on particular tools and platforms, providing limited breadth in cybersecurity theories and methodologies.

What Distinguishes the Proposed BSc

Compared to other similar programs, our BSc program has much broader coverage of different aspects of cybersecurity and cutting-edge cybersecurity technologies. In addition to hands-on experiences, the design of our courses also equips students with a deeper understanding of the subject matters at theory level, empowering students to develop their understanding and skills with the evolution of the technologies and challenges in the field. Moreover, our program offers integrated co-op programs starting from the beginning of the program, which will be among the very first such programs offered in Quebec and in Canada. Other dedicated BSc programs offered in Quebec and Canada don't offer co-op options except for the BSc program offered by Seneca College in Ontario.

Target Audience

The BSc program is ideal for students seeking a targeted education in cybersecurity that can be completed in a shorter timeframe. Compared with the BEng program, the BSc program 1) does not include the extensive engineering training provided by the engineering core courses; 2) requires a much smaller set of cybersecurity core courses (50% of that of BEng), which makes it a perfect fit for those who may already have some IT experience or education and are looking to upskill, as well as those eager to dive quickly into cybersecurity careers, including roles that require a deep, but less broad, understanding of the field. This program complements the broader BEng option by providing an alternative pathway that is more focused and expedited.

The program will appeal to students looking for jobs that do not require professional engineer designations, such as cybersecurity analysts, security/network/system administrators, and security specialists in cloud/database/software, among others.

As a comprehensive program covering all theoretical foundations of cybersecurity, the BSc program will also appeal to students who plan to apply for graduate schools directly after obtaining the Bachelors; In addition, the BSc program can also attract students in, e.g., Electrical Engineering, Computer Engineering, Computer Science, and Software Engineering who are interested in taking cybersecurity as a minor or double major.

The Concordia University Advantage

Concordia University boasts a strong research capacity in cybersecurity, featuring one of Canada's largest academic teams focused on the field. The Security Research Center (SRC) at Concordia hosts 13 faculty members, 4 industry research chairs, 30 PhD candidates, and 30 master's students dedicated to cybersecurity projects. Since 2005, Concordia has been offering two specialized master's programs in cybersecurity and a PhD program in Information and Systems Engineering. With these extensive resources and established expertise, CIISE is well-equipped to deliver a high-quality BSc program to meet the expectations of students, industry, and society.

Implementation and Financial Viability

Slated for launch in September 2025, the BSc program is expected to attract a steady stream of applicants due to the long-term industry growth projections. Most of the resources needed to implement the program are already available within the CIISE and Gina Cody School of Engineering and Computer Science. We are also applying for a twin bachelor's degree program: BEng in Cybersecurity. The courses and labs will be shared by these two programs. We are not requesting new tenure track positions nor new lab spaces to make the program fully operational. The proposed program is expected to yield a positive surplus for the University from the first year of its operation.

2. PROGRAM IDENTIFICATION

2.1. Degree awarded: Bachelor of Science

2.2. Discipline: Cybersecurity

2.3. Program Title: Bachelor of Science in Cybersecurity

2.4. Administrative location:

University: Concordia University

Faculty: Gina Cody School of Engineering and Computer Science (GCS)

Department: Concordia Institute for Information Systems Engineering

Address: 1455 de Maisonneuve Blvd. W, Montreal, Québec, H3G 1M8, Canada

3. FIELD OF STUDY AND RELEVANCE

3.1. Field of study

Cybersecurity is a science and engineering discipline that applies the principles of engineering and natural sciences for the prevention of damage to, protection of, and restoration of computers, electronic communications systems, electronic communications services, wire communication, and electronic communication, including information contained therein, to ensure its availability, integrity, authentication, confidentiality, and nonrepudiation¹. Cybersecurity entered the public consciousness in the late 1980s; since then, it has been evolving at break-neck speed and shows no signs of slowing down. Cybersecurity is now a core part of our modern life and represents one of the fastest growing industries worldwide. Cybersecurity has evolved to cover many different domains, including information security, critical infrastructure security, network security, application security, storage security, cloud security, Internet of Things (IoT) security, mobile security, etc.

Cybersecurity is one of the fast-growing training programs at many Canadian universities. According to the Canadian Centre for Cyber Security², cybersecurity is offered as a post-secondary program at 78 Canadian institutions across eight provinces. Among these, only four universities are providing cybersecurity as a dedicated bachelor's degree program. This shows an urgent need for the proposed BSc degree programs in cybersecurity. Concordia University is one of the pioneers in Canada to offer dedicated master's programs on cybersecurity, and adding the proposed cybersecurity undergraduate programs to the portfolio of core disciplines will deliver a next-generation education in line with Concordia's strategic directions, which will distinguish Concordia from other universities and elevate its national research profile to the very top echelon.

In such a context, the creation of the proposed programs is motivated by the: (i) imperative to secure our IT systems against such emerging cybersecurity threats; (ii) vital obligation for governments and corporations to protect their IT systems against attacks that might lead to severe security and economic consequences, and even to the endangerment and loss of human lives. These attacks might be carried out by a wide spectrum of individuals such as criminals, cyber-terrorists, terrorists and foreign government agencies; (iii) the fast evolving nature of the cybersecurity threats to IT systems, and the corresponding need for continuously upgraded cybersecurity solutions and cybersecurity expertise; (iv) availability of the body of knowledge in cybersecurity and the essential need to train highly qualified personnel to administer and operate the security of IT systems.

The program's main academic aim is to prepare students for a career in cybersecurity through comprehensive training in the latest technologies and industry best practices. It's designed to develop graduates who are ready to secure critical systems across key sectors including government, healthcare, and telecommunications. Additionally, the curriculum focuses on fostering research skills, engaging students in applied research to examine existing theories and their impact on cybersecurity practices.

3.2. Areas(s) of expertise

The proposed program consists of 90 credits. The curriculum is developed to provide the students with both theoretical knowledge and hands-on practice on Cybersecurity and Cybersecurity Engineering principles. A variety of pedagogical approaches including work-integrated learning, blended learning, laboratory training will be used to foster student success. Beyond the core Cybersecurity curriculums, students can choose elective courses from a variety of specialized technical areas such as smart grid security, cyber-physical security, network security, cloud security, blockchain security, and IoT security. Refer to Section 7 for further details.

¹ <https://csrc.nist.gov/glossary/term/cybersecurity>

² <https://cyber.gc.ca/en/guidance/appendix-b-post-secondary-cyber-security-related-programs>

Below are some key highlights of the proposed program:

- The proposed programs will be geared towards students with an interest in cybersecurity, and an interest in tackling the fast-evolving cybersecurity challenges of society.
- The curriculum will bring together both general computer science principles and specialized cybersecurity focuses. Furthermore, we envision having a strong hands-on training component that will leverage unique research and teaching infrastructures in the area of cybersecurity.
- The proposed program will offer students a comprehensive body of knowledge including cryptography, foundations for secure information systems, access control, security policies and security mechanisms, operating system security, network security, security vulnerabilities and malware defense, secure programming, etc.
- The program will also help students to develop various security skills, including penetration testing skills, risk assessment and security management skills, security engineering skills, IDS/IPS/firewall deployment skills, security monitoring skills, incident handling and forensic analysis skills, secure network management skills, regulatory compliance and auditing skills, etc.
- A key distinctive feature of this program is its dedicated, broader, and deeper coverage of the discipline and effective co-op program. As cybersecurity encompasses a number of disciplines, a key element of the proposed programs is to learn the fundamentals of cybersecurity through a multi-disciplinary curriculum. In addition, an effective co-op program offers a significant advantage in the learning process of students, as it will provide them the opportunity to be exposed to different aspects of real-life systems, as well as realistic problems where they gain practice and improve their academic knowledge.
- Given the practical nature of this program, a significant number of course and research projects will be in collaboration with industrial partners such as Hydro-Québec, Thales, Ericsson, and also Canadian government agencies such as Public Safety Canada. In addition, we will leverage the CIISE's Advisory Board's industrial/government members to create effective feedback loops that will contribute to the enhancement of the program, as well as the cybersecurity research within CIISE and Concordia University.
- Furthermore, students in this program will be given the opportunity to enroll, through the Institute for Cooperative Education, in the Co-op program whereby they will gain industrial/research experience within the industrial milieu under the joint supervision of an industrial mentor and a faculty member.
- This program differentiates itself from the program at Polytechnique Montreal through a focus in training of cybersecurity professionals, particularly through tailored courses under the Canadian Information Processing Society (CIPS) accreditation requirements, extensive collaborations with industry, co-op and internships with reputable companies and organizations.

4. PROGRAM RATIONALE

4.1. Socio-economic and socio-cultural opportunities

4.1.1. *Economic, social, and cultural needs*

Cybercrime has reached unprecedented levels in recent years. In Canada, according to Statistics Canada's annual report³ "Impact of cybercrime on Canadian businesses 2021" (released on 2022-10-18), almost one-fifth (18%) of Canadian businesses were impacted by cyber security incidents in 2021, in contrast to 21% of Canadian businesses in both 2019 and 2017 that were impacted. This includes 16% of small businesses (10 to 49 employees), 25% of medium businesses (50 to 249 employees), and 37% of large businesses (250 or more employees) who report being impacted by cyber security incidents in 2021. The situation in other countries is similar, e.g., according to the annual report of FBI's Internet Crime Complaint Center⁴, there are 850,000 complaints in 2021 leading to potential losses exceeding \$6.9 billion in the US alone.

The nature of cybercrime threats has continuously evolved as well, with ransomware, business e-mail compromise (BEC) schemes, and the criminal use of cryptocurrency among the top incidents reported. In particular, according to Statistics Canada, the most common types of cybersecurity incidents identified by business in 2021 were incidents related to theft of money or demand for ransomware payments (7%) and incidents related to theft of personal or financial data (6%). The Communications Security Establishment (CSE), Canada's foreign signals intelligence agency, reported 235 ransomware incidents against Canadian victims from Jan. 1 to Nov. 16 in 2021, with more than half of those targets being critical infrastructure providers, including those in the energy, health and manufacturing sectors. While most impacted businesses identified external parties (61%) as the perpetrator of cyber security incidents, 38% of impacted businesses could not identify the perpetrator. Other perpetrators identified were internal parties (5%) and known third parties (6%), like a supplier or customer.

The financial impact of cybersecurity incidents to businesses has been skyrocketing in the past years. According to Statistics Canada, in 2021, 11% of Canadian businesses that were impacted by a cyber security incident were due to ransomware attacks, which has become more known and utilized by attackers in recent years. Among these businesses, a large proportion (82%) reported that they did not pay the ransom, whereas a smaller proportion (18%) reported that they made a ransom payment and 1% of those were reportedly paying more than \$500,000 (among which 14% of did so with cryptocurrency). In the US, according to FBI, the amount lost from the cybersecurity incidents jumps from \$4.2 billion (2020) to \$6.9 billion (2021), which largely stems from scams like extortion, identity theft, and data breaches. The financial impact of cybersecurity incidents to businesses also come in many other forms. According to Statistics Canada, in 2021, about 40% of businesses that were impacted by a cyber security incident (which amount to 18% of all businesses) also experienced downtime as a result, with an average downtime duration of 36 hours, which may imply significant losses of businesses. Other commonly reported impacts of cybersecurity incidents included additional time required by employees to complete their day-to-day work (21%), prevention of employees from carrying out their day-to-day work (18%), and loss of revenue (14%). Canadian businesses impacted by a cyber security incident reported to have spent a total of slightly over 600 million dollars to recover, an increase of about 200 million dollars from 2019. In addition to such direct impact, cyber attacks can also imply additional expenses of businesses to detect or prevent such attacks. According to Statistics Canada, in 2021, the percentage of businesses that reported spending additional money on cybersecurity solutions remained stable in 2021 (61%) compared with 2019 (62%). However, the amount of money spent to detect or prevent cyber security incidents by Canadian businesses has increased by about \$2.8 billion in 2021 to \$9.7 billion when compared with 2019. Among these, large businesses contributed about half of the total (\$4.4 billion), and small businesses spent \$2.9 billion and medium businesses spent \$2.4 billion.

In addition to financial impact, cyber attacks can also generate significant social and cultural impact affecting the daily life of millions of Canadians. For instance, the following lists some of the recent high-profile cyber incidents in Canada:

³ <https://www150.statcan.gc.ca/n1/daily-quotidien/221018/dq221018b-eng.htm>

⁴ https://www.ic3.gov/Media/PDF/AnnualReport/2021_IC3Report.pdf

- In February 2022, two Quebec factories, the Alouette aluminum plant in Sept-Îles and the Bridgestone tire plant in Joliette, were victims of separate cyberattacks. Bridgestone has stopped production in all its factories in North America and Latin America while it conducts an internal investigation.
- In May 2022, IKEA confirmed an internal security breach that has impacted the personal information of up to 100,000 Canadians, when some of those customers' personal information appeared in a generic search made by an IKEA employee.
- On October 30, 2021, the Canadian province of Newfoundland and Labrador suffered a cyberattack that led to severe disruption to healthcare providers and hospitals. The attack caused regional health systems to shut down their networks and cancel thousands of medical appointments for chemotherapy, x-ray scans, surgeries, and other specialist services. The IT outage also affected communications in the region, with people reporting an inability to reach the health care centers or 911 via phone.
- On June 14, 2021, Humber River Hospital in Ontario was forced to shut down its IT systems due to ransomware, forcing staff to declare a code grey (a loss of essential services) with clinics cancelled and ambulances redirected. To prevent the ransomware from encrypting files, the hospital immediately shut down all of its over 3,000 computers and servers, leaving hospital staff including pharmacy professionals unable to access electronic patient records.
- On December 14, 2021, Superior Plus, Canada's largest propane distributor with roughly 800,000 customers across the U.S. and Canada, announced a major ransomware attack that started on December 12, 2021. To secure the internal system during the attack and start the investigation process, Superior Plus temporarily disabled certain computer systems and applications. Additionally, the company drafted cybersecurity experts to help deal with the incident and assess the impact of the breach. A similar case also happened to Superior's biggest competitor, AmeriGas, which was also impacted by a cyberattack earlier that year.
- In November 2020, Home Depot Canada started receiving the first reports of the data breach that, according to the official press release, "seems to be the result of an internal system error rather than an external attack". Its customers started receiving reminder emails by mistake for hundreds of orders that were ready to pick up, in some cases users reported receiving up to 1,000 emails per one address or even more. The email content included customer names, email addresses, order numbers, and the last four digits of customer payment.
- In June 2019, it was reported that Desjardins exposed personal data of over 10 million customers over nearly two years without being noticed. The security department became aware of it only after the organization had been notified by the federal Privacy Commissioner. According to the commissioner's report, the rogue employee siphoned sensitive personal information collected by Desjardins from customers including first and last names, dates of birth, social insurance numbers, street addresses, phone numbers, emails, and transaction histories.
- In November 2018, Canada Post leaked the personal data and orders of thousands of cannabis smokers. the Ontario Cannabis Store (OCS), the only legal supplier in the region at the time of that accident, reported that hackers accessed the order records of 4,500 customers – it's roughly 2% of the firm's customer base. The compromised information included names or the initials of nominated signatories, postcodes, dates of delivery, OCS reference numbers, Canada Post tracking numbers, and OCS corporate names and business addresses.
- In May 2017, Bell Canada reported its largest customer data breach which affected close to 1.9 million customer email addresses, as well as 1,700 names and phone numbers. The responsibility for the attack wasn't named, but in the information released it was mentioned the hackers were leaking the information due to Bell's failure to cooperate with them.

Given the increasing prevalence and sophistication of cyber threats, the proposed program is more than an academic response—it's a societal imperative. By nurturing a cadre of skilled cybersecurity professionals, the program directly contributes to safeguarding our socio-economic and socio-cultural spheres. Graduates from this program will serve as the frontline defense against cyber threats that target critical infrastructure, financial institutions, and personal data, thereby maintaining the integrity of our societal functions.

4.1.2. Evolution of the fields in Quebec

The fields of Cybersecurity and Critical Infrastructure Security (CIS) are rapidly evolving, and the province of Quebec has emerged as a focal point for these advancements in Canada. This evolution is evidenced through a series of concerted efforts made by the Quebec government, educational institutions, and the industry sector, reflecting a broad-based commitment to fostering growth in this field.

Government initiatives and policies

In recent years, the Quebec government has launched several initiatives and policies aimed at promoting innovation and strengthening cybersecurity. One significant move in this regard is Quebec's Digital Innovation Strategy 2017-2022⁵, which allocated substantial funding to drive digital transformation across diverse sectors. This forward-looking strategy identified key areas for development, such as cloud computing and big data. In addition, initiatives such as the Smart Cities Challenge⁶ further underscore the commitment of the Quebec government to integrate cyber-physical systems in urban environments. This competition encourages municipalities to create smart, innovative solutions using data and connected technologies. Cybersecurity plays an important role in ensuring the viability of those initiatives.

Meanwhile, the provincial government has set objectives to make cybersecurity a priority, ensure public services are secure, and keep citizens informed and confident⁷. This focus dovetails with the creation of the Ministry of Cybersecurity and Digital (Le ministère de la Cybersécurité et du Numérique), officially established on January 1, 2022, led by Minister Éric Caire. The Ministry's establishment is a pivotal part of Quebec's strategy to meet the challenges of cybersecurity and public service digitization⁸. With the launch of its first strategic plan for 2023-2027 (Dépôt du Plan stratégique 2023-2027 du ministère de la Cybersécurité et du Numérique), the Ministry has pledged to bolster the province's defenses against cyber threats⁹.

These government-led endeavors underscore a comprehensive approach to fostering innovation and securing the digital landscape. These measures serve not only to protect against emerging cyber threats but also to cultivate a skilled workforce adept in cyber and critical infrastructure security, crucial for Quebec's evolving digital ecosystem.

Education and research

Quebec has experienced significant growth in cybersecurity related areas within its higher education and research institutions. These institutions have developed extensive programs and research facilities to support the growth of cybersecurity expertise. For instance, Polytechnique Montréal offers a range of cybersecurity educational opportunities from undergraduate to graduate level and specialized certificate program. Concordia's Gina Cody School of Engineering and Computer Science, through its Concordia Institute for Information Systems Engineering (CIISE), provides specialized graduate programs and excels in cryptography and system security research. Furthermore, the Université de Montréal has made strides with its Artificial Intelligence for Cybersecurity Lab, contributing to the confluence of AI and cybersecurity.

The creation of the Multidisciplinary Institute for Cybersecurity and Cyber Resilience (IMC²) marks an even more significant step forward in Quebec's academic sector. IMC² is a collaboration between Polytechnique Montréal, Université de Montréal, and HEC Montréal, pooling the expertise of 44 professors and their research teams to

⁵ Québec Research and INNOVATION STRATEGY 2017-2022, <https://publicsectornetwork.com/insight/quebec-research-and-innovation-strategy-2017-2022>

⁶ <https://www.ville.quebec.qc.ca/villeintelligente/>

⁷ <https://www.quebec.ca/gouvernement/politiques-orientations/vitrine-numeriqc/politique-gouvernementale-de-cybersecurite#:~:text=%E3%80%91>

⁸ <https://incyber.org/quebec-cree-ministere-cybersecurite/#:~:text=Comme%20annonc%C3%A9%20en%20d%C3%A9cembre%202021,%C2%BB%2C%20dirig%C3%A9%20par%20Eric%20Caire>

⁹ <https://www.quebec.ca/nouvelles/actualites/details/depot-du-plan-strategique-2023-2027-du-ministere-de-la-cybersecurite-et-du-numerique-48575>

provide leading-edge research, innovation, and training in cybersecurity and cyber resilience¹⁰. IMC² also aims to create links between academia and external cybersecurity players such as the NPO Cybereco and the IN-SEC-M cluster, significant contributors to the cybersecurity ecosystem in Quebec and Canada.

Quebec boasts over 30 research chairs and labs, including the research chair (Dr. Mourad Debbabi) in cyber-physical security at Concordia University partnering with Hydro-Québec and Thales, directly applying cybersecurity knowledge in safeguarding critical infrastructures, and the Desjardins/National Bank Industrial Research Chair in Cybersecurity at Polytechnique Montréal, dedicated to studying AI applications in cybersecurity¹¹. These resources significantly enhance the province's educational and research capabilities, fostering specialized programs that meet the evolving needs of these technological fields.

Moreover, Quebec's R&D landscape is thriving with projects that integrate AI with cybersecurity, propelled by substantial investment and collaborative partnerships. A notable example is Concordia University's cutting-edge research in AI and cybersecurity, which has been bolstered by a substantial \$2.25-million grant from National Defence¹². These efforts underscore the province's commitment to advancing education and research in cybersecurity.

Industry growth and demand

Quebec has witnessed a significant rise in demand for cybersecurity and Critical Infrastructure Security (CIS) skills, a trend in line with Canada's position as the fourth-ranked global destination for foreign investment in the cybersecurity sector¹³. This surge is largely driven by the province's growing reliance on technology across diverse critical sectors, such as healthcare, transportation, energy, and utilities, necessitating advanced CIS capabilities. This demand aligns with the nationwide trend where specialized skills, particularly in cybersecurity and AI, are in high demand yet in short supply, as noted by the Industrial Relations Centre at Queen's University¹⁴.

Moreover, Quebec's thriving tech industry, with its vibrant start-up scene and tech hubs, has further stimulated the demand for these skills. Quebec boasts a robust IT network, comprising over 230,000 professionals, 18,000 university students, and about 10,000 IT companies. The presence of many world-class cybersecurity leaders, low costs, and generous government support have made Quebec an attractive location for cybersecurity investments. The province has attracted major companies like GoSecure, Hitachi Systems Security, and RHEA Group, which have contributed to a vibrant ecosystem that supports and drives the demand for these specialized skills.

With strategic governmental initiatives and policies, a thriving academic and research environment, and burgeoning industry and market demand, Quebec is placing itself at the forefront of innovation in cybersecurity and CIS. These factors collectively contribute to an expanding landscape ripe for a new program tailored to these crucial skills.

4.1.3. Justification of the proposed program

Given this context, the demand for skilled cybersecurity professionals has become unprecedented. Employers across Quebec and Canada are seeking highly qualified personnel to design, implement, deploy, and operate the security of products, services, and systems. The employment demand in this area is rapidly outpacing the supply, driven by an ever-evolving threat landscape, more frequent cybersecurity incidents, geopolitical tensions, and the paramount need to secure ICT systems. This trend is expected to continue, fueled by global political, economic, and social changes, the expansion of ICT, and escalating security risks. We are entering an age where intelligent systems will become

¹⁰ <https://www.polymtl.ca/salle-de-presse/en/newsreleases/launch-multidisciplinary-institute-cybersecurity-and-cyber-resilience-imc2>

¹¹ <https://www.investquebec.com/international/en/press-room/news/Quebec-A-True-Cybersecurity-Hub.html#:~:text=Canada%2C%20the%20fourth,Here%E2%80%99s%20what%20motivated%20their%20choices>

¹² <https://www.investquebec.com/international/en/press-room/news/Quebec-A-True-Cybersecurity-Hub.html>

¹³ <https://www.investquebec.com/international/en/press-room/news/Quebec-A-True-Cybersecurity-Hub.html>

¹⁴ <https://irc.queensu.ca/hot-skills-in-a-dynamic-canadian-labour-market/>

increasingly deployed and integrated across almost all sectors of our societies (e.g., aerospace, automotive, energy, transportation, healthcare, defense, and manufacturing), necessitating sophisticated security solutions.

A 2021 study by the Information and Communications Technology Council (ICTC), a national, not-for-profit centre of expertise that aims to strengthen Canada's digital advantage, estimates that Canada currently employs approximately 124,000 cybersecurity professionals but urgently requires an additional 25,000, leaving one in six positions unfilled. This gap represents one of the country's biggest challenges in the digital economy. Also, according to TECHNATION, the national association representing Canada's information, communications, and technology (ICT) industry, there is an average of 4,000 vacancies in cybersecurity jobs on any given day, with around 20 per cent of those jobs going unfilled, a rate that is increasing year by year.

As such, it is anticipated that the employment demand and the enrolment for the proposed BSc program will be very high and increasing, especially in the lack of similar academic programs in this field within Quebec and Canada. In fact, the bachelor's degree is shown to remain the preferred college credential among cyber security specialists. According to the statistics from [careeronestop.org](https://www.careeronestop.org)¹⁵, 42 percent of those working in cyber security hold a bachelor's degree compared with 25% of them hold a master's degree and 16% of them hold some college level degree or training. At CIISE, we have been training cybersecurity experts at master's levels for more than 20 years. Given the substantial growth in enrollments over the years, it is reasonable to predict that the demand for our BSc program will be even larger. The trained students can be hired by the different layers of governments, corporations and industry to fight the ever-evolving security threats to IT systems.

4.1.4. Student Interest Surveys

4.1.4.1 CEGEP student survey

At a recent open-house, CIISE surveyed 106 attendees, predominantly CEGEP students (65%), revealing a significant interest in cybersecurity undergraduate studies at Concordia University. About half of the respondents had already investigated if cybersecurity programs were available at Concordia, and a substantial 74% (79/106) expressed moderate to high interest in such program. Additionally, 73% (78/106) requested to receive more information about our program by leaving their contact information.

The survey pinpointed essential considerations that influence prospective students' decisions in choosing a university program: post-graduation career prospects, the presence of a co-op program, and the availability of pragmatic courses geared towards equipping students with skills for immediate entry into the workforce. Overall, the survey data demonstrates a clear market for the proposed program and the importance of aligning it with student aspirations and industry needs. See *Appendix 5* for detailed survey results and analysis.

4.1.4.2 Concordia GCS undergraduate student survey

To gauge interest in the concurrently proposed BEng program, a survey was conducted among 2,500 engineering undergraduates at the Gina Cody School of Engineering and Computer Science, with 536 students participating, representing a 21% response rate. One survey question focused on the level of interest in a potential BSc program, revealing that 31% of respondents, equating 156 students, indicated a 'very likely' interest, with an additional 20%, or 101 students, responding as 'likely'. See the screenshot below for details.

¹⁵ <https://www.careeronestop.org/Toolkit/Careers/Occupations/occupation-profile.aspx?keyword=Information%20Security%20Analysts&location=UNITED%20STATES&onetcode=15121200>

Q12 - If we also offer a 90-credit (three-year) BSc in Cybersecurity program that does not require engineering core courses, how likely is it you would apply to the BSc in Cybersecurity program?	Percentage	Count
Very likely	31%	156
Likely	20%	101
Somewhat likely	17%	86
Unlikely	27%	138
Don't know	4%	21

The survey results indicate strong support for both the BEng and the BSc programs in Cybersecurity. See *Appendix 5* for detailed survey results and analysis.

4.1.5. Industry Expert Survey

In order to gather informed perspectives on the demand for and structure of both the proposed BEng and BSc programs in cybersecurity, we conducted a survey that reached out to 50 industry experts through CIIS faculty networks. This survey elicited 39 detailed responses from a broad spectrum of professionals, ranging from executive leaders to technical specialists across sectors including aerospace, power/energy/utilities, technology consulting, telecommunications, finance, healthcare, and defense. The roles of these experts cover strategic to technical spectrums, offering a wealth of insights into the varied cybersecurity challenges and needs that our program is positioned to meet.

Market Demand for Cybersecurity Professionals

Based on the survey responses, the market demand for cybersecurity expertise is expected to grow considerably, as evidenced by 97% of respondents who indicated a 'very likely' surge in job demand over the next five years. Furthermore, a significant 79% recognized either a 'critical need' or 'high need' for training and skill updating in cybersecurity-related roles. Additionally, 55% of the respondents reported facing challenges when attempting to hire skilled cybersecurity personnel for their organizations.

Potential Job Titles or Roles for BSc Graduates

The surveyed experts provided a long list of job roles that do NOT require CEAB accreditation, suitable for BSc graduates. Some of them are listed below as examples: (See *Appendix 5* Industry Expert Survey report for the full list):

1. Cybersecurity Analyst
2. Cybersecurity Specialist
3. Security Consultant
4. Security Architect
5. Incident Response Consultant
6. Red Team Consultant
7. Strategic Cybersecurity Consultant
8. IT Professional
9. Cyber Security Tester / Technician
10. Project Manager of Cybersecurity

Potential Job titles or Roles for BEng graduates

In contrast, below are some examples of cybersecurity-related job roles that survey respondents feel require CEAB

accreditation, suitable for BEng graduates (See *Appendix 5* Industry Expert Survey report for the full list):

1. Avionics Cybersecurity Researcher
2. Cybersecurity Researcher
3. Embedded Cyber Researcher
4. Incident Response Consultant
5. Red Team Consultant
6. Strategic Cybersecurity Consultant
7. Security Operational Personnel
8. Developers with a Security Background
9. Vulnerability Testers
10. Security Architects

Comparison of Career Outlooks for the Two Proposed Programs

Comparing the two lists, several observations emerge:

1. **Overlap in Roles:** Some job titles appear on both lists, such as Incident Response Consultant and Security Architect. This could indicate that while CEAB accreditation is beneficial, it may not be a strict requirement for these roles, and a BSc degree could be sufficient depending on the employer's needs.
2. **Specialization and Engineering Focus:** The list for BEng graduates includes more roles with 'engineer' in the title, suggesting that jobs requiring CEAB accreditation are more technically specialized and may involve a deeper level of engineering knowledge.
3. **Research and Development:** Job titles unique to the BEng list, such as Avionics Cybersecurity Researcher and Embedded Cyber Researcher, imply a focus on research and development within cybersecurity, which may require the rigorous engineering foundation provided by a BEng degree.
4. **Operational and Technical Positions:** The BSc list features roles that lean towards operational and technical aspects, such as Cybersecurity Analyst and IT Professional, which might focus more on the application of cybersecurity principles rather than their development.
5. **Management and Strategic Roles:** Both lists include strategic roles like Strategic Cybersecurity Consultant and Project Manager of Cybersecurity, indicating that both BSc and BEng graduates could move into strategic positions, but the BEng might provide a competitive edge for technical management roles.
6. **Security and Infrastructure:** The BEng list seems to emphasize the security of infrastructure and networks more, with titles like ICS/OT Cybersecurity Engineers and Network Security Engineers, which often require an understanding of complex systems that a BEng program would provide.
7. **Variety of Sectors:** Both lists suggest a demand across diverse sectors, from IT to industrial, showing that cybersecurity is a multifaceted field with a range of opportunities for graduates of both programs.

In summary, BEng roles tend to require a stronger engineering background, potentially involving research and development, while BSc roles focus on the practical application of cybersecurity, management, and strategic planning. This information provided by the survey experts further clarified the career outlooks for graduates of the two proposed programs.

Essential Knowledge and Skills

Responding to the related open-ended questions, the surveyed experts provided us with lists of topics/areas and skills they considered essential and in high demand for cybersecurity professionals.

Essential Topics and Areas

- Cloud Security: Knowledge of major cloud platforms like AWS, GCP, Azure.
- DevSecOps and Cloud Native Security: Emphasis on integrating security into development operations.
- AI/ML and Quantum Computing: Understanding the implications of these technologies for cybersecurity.
- Critical Infrastructure Protection: Focus on securing computer networks, telecommunications, and control

systems.

- Hands-On Experience: Importance of practical projects and real-world scenario training.
- Interdisciplinary Knowledge: Combining IT architecture, legal aspects, and business operations.

Skills in High Demand

- Cloud Security: Particularly in cloud-native environments.
- Threat Identification and Response: Skills like threat hunting and incident management.
- Vulnerability and Risk Management: Including ethical hacking and compliance knowledge.
- System and Network Security: Essential technical skills in these areas.
- AI and ML: Growing importance in the cybersecurity domain.
- Communication and Documentation: Crucial for effective cybersecurity management.

Interdisciplinary Expertise

The survey indicates a strong consensus among respondents on the importance of interdisciplinary knowledge in cybersecurity, with 97% of respondents rating it as “very important” or “somewhat important” (Q19). Communication, particularly in the context of managing public relations during a cyber incident, and legal knowledge, especially regarding the implications of data breaches, are both frequently mentioned as crucial interdisciplinary areas for cybersecurity professionals. Risk assessment and an understanding of new technologies such as AI, cloud infrastructure, and network security also recur as areas of importance (Q20). These repeated mentions underscore the demand for a skill set that extends beyond technical expertise to include strategic, legal, and communicative competencies.

Professional Competencies

Among six key professional competencies presented to the survey respondents (Q17), *Problem-solving skills* and *Ethical judgment and integrity* are most valued (both marked as “critically important” by 24 respondents). *Continuous/lifelong learning* follows closely receiving 23 ratings for being “Critically important”. When combining the “Critically important” and “Very important” categories, the top three valued skills are *Technical proficiency* (34), *Problem-solving skills* (33), and *Ethical judgment and integrity* (33), followed by *Continuous/lifelong learning* (31). While *Communication skills* and *Teamwork and collaboration* are less emphasized overall, they are still recognized as “Very important” or “Critically important” by 25 and 23 respondents respectively. These findings highlight the critical need for a holistic skill set in cybersecurity, emphasizing not just technical proficiency, but also problem-solving, ethical decision-making, and a commitment to continuous learning and adaptability.

Experiential Learning Opportunities

When asked what types of experiential learning or work-integrated opportunities their organizations can provide to our program students (Q23), out of 35 responses, 27 selected onsite internships or co-op and 21 chose research collaborations, followed by mentorship opportunities (16) and course-based experiential learning (16). Other opportunities include virtual internship (9), field projects (6), live case studies or simulations (6), industry sponsored competitions (6), job shadowing (5), reflecting a range of industrial collaboration possibilities for enriching the curriculum with ample opportunities for practical applications.

Industry Partnerships and Collaboration

Survey respondents showed a strong inclination towards collaborating with our cybersecurity programs, particularly in joint research, guest lectures, workshops, and advisory committee roles, with 21/33 interested in each of those activities. Additionally, 18 respondents were keen on contributing to course design. Mentorship, networking events, and offering specialized lab access also received several votes, indicating diverse collaboration opportunities.

Key Trends and Anticipated Changes

In responding to the open-ended questions probing industry trend, surveyed experts shared that cybersecurity professionals are likely to face a rapidly evolving threat landscape over the next decade, driven by the integration of AI and quantum computing into the fabric of cybersecurity. The program must address current trends like DevSecOps,

cloud security, and the protection of critical infrastructure, while also preparing students for the future, where AI-driven attacks, quantum encryption, and the security of remote work will become focal points. As regulations tighten and the need for privacy safeguards grows, professionals will be required to adapt to emerging technologies and maintain a continuous learning mindset to stay ahead of sophisticated cyber threats.

These insights directly from industry experts provide a focused roadmap for curriculum development of the proposed program. See *Appendix 5* for detailed survey results and analysis.

4.1.6. Current and Projected Cybersecurity Job Market in Quebec and Canada

Market Demand and Salary Trends

The data from LightCast job posting analytics over the last five years (Feb 2019 - Jan 2024) indicates a thriving cybersecurity job market in Quebec for those with a bachelor's degree, with 1,268 unique job postings from 252 different employers. The median advertised salary (revealed by 3% of total postings) stands at \$104,200, higher by \$15,500 than the government's recorded median for cybersecurity specialists in the region. In contrast, Canada-wide data shows 9,913 unique job postings with 2,245 employers. The median salary across Canada (revealed by 10% of total postings) is reported at \$95,000 (surpassing the government's recorded median by \$5,400), indicating a healthy demand and remuneration for cybersecurity expertise at the national level.

Five-year Job Posting Trends

The past five-year trend in cybersecurity job postings for bachelor's degree holders in Quebec shows fluctuations without clear upward or downward trend, except for a pronounced spike in early 2021. This surge is likely linked to the COVID-19 pandemic's impact, which led to increased remote work and consequently, greater cybersecurity needs, as supported by findings from [McKinsey](#)¹⁶, [Deloitte](#)¹⁷, and [Statistics Canada](#)¹⁸. The investments in cybersecurity measures during the pandemic, such as increased spending on prevention and detection, suggest that the heightened awareness and need for robust cybersecurity will likely persist into the future.

In contrast, the Canada nation-wide data indicates a general upward trend with some variability. Notably, there is a significant rise in postings around February 2021, similar to the trend observed in Quebec. This peak could be indicative of a nationwide response to the cybersecurity challenges posed by the pandemic, with increased demand for professionals holding a bachelor's degree in related fields. The trend also seems to stabilize at a higher level post-2021 compared to the pre-pandemic era, suggesting a sustained demand for qualified cybersecurity professionals across Canada. The fluctuations following the peak indicate that while there may be seasonal or economic factors affecting job postings, the overall market for cybersecurity expertise remains robust. This implies that the pandemic-induced increase in cybersecurity job postings is likely not a temporary spike but a reflection of a more persistent demand in the job market. See the visuals of both job posting trends in the full Lightcast Job Posting Reports included in *Appendix 5*.

Top Five Hiring Companies

The table below shows the top five employers of cybersecurity specialists along with the total number of unique postings for each employer in Quebec and Canada over the past five years.

¹⁶ McKinsey & Company: <https://www2.deloitte.com/ch/en/pages/risk/articles/impact-covid-cybersecurity.html>

¹⁷ Deloitte: <https://www2.deloitte.com/ch/en/pages/risk/articles/impact-covid-cybersecurity.html>

¹⁸ Statistics Canada: <https://www150.statcan.gc.ca/n1/pub/22-20-0001/222000012023001-eng.htm>

Rank	Employer in Quebec	Postings (Quebec)	Employer in Canada	Postings (Canada)
1	Bell	96	TD Bank	425
2	Desjardins Group	67	Procom	264
3	Bonidollars	58	Bell	227
4	Banque Nationale	58	TELUS	221
5	Morgan Stanley	50	Deloitte	201

Top Ten Job Titles

The table below shows the top ten cybersecurity job titles in demand along with the number of unique postings for each job title for both Quebec and Canada:

Rank	Job Title (Quebec)	Unique Postings (Quebec)	Job Title (Canada)	Unique Postings (Canada)
1	Cybersecurity Specialists	72	Information Security Analysts	535
2	Cybersecurity Analysts	63	Cybersecurity Analysts	484
3	IT Security Analysts	42	Cybersecurity Specialists	402
4	Information Security Analysts	38	Cybersecurity Managers	299
5	Vulnerability Management Analysts	35	Information Security Specialists	272
6	Security Advisors	33	Information Security Managers	239
7	Specialist Information Security Analysts	28	Cybersecurity Consultants	198
8	Identity and Access Management Managers	26	IT Security Analysts	185
9	Cybersecurity Managers	25	Security Analysts	171
10	Cybersecurity Consultants	22	Technology Risk Managers	154

See the two full Lightcast reports in *Appendix 5* for more details.

4.1.7. Future prospects for graduates

Cybersecurity graduates are typically trained to be the designers, analysts, and administrators of both public and private sectors involving information technology (IT) systems and operational technology (OT) systems. There is a growing demand of cybersecurity graduates within the Government of Canada¹⁹; specifically, federal organizations, such as Canadian Security Intelligence Service (CSIS), Public Safety Canada (PS), Communications Security Establishment (CSE), Royal Canadian Mounted Police (RCMP), Shared Services Canada (SSC), etc. actively recruit cybersecurity professionals. Cybersecurity graduates are also involved in operations, development, planning, and technical support. As cybersecurity involves with almost all the organizations and businesses, cybersecurity graduates also find employment in sectors related to IT/OT (management, banking, healthcare, insurance, policy, etc.). Their training and skills often complement those of decision makers and executives in secure operation of businesses.

The program will appeal to students looking for entry-level jobs like cybersecurity analysts, security/network/system administrators, and security specialists in cloud/database/software, among others. Similar to graduates of the BCompSc program who qualify and are in high demand as entry-level programmers, web designers, and application developers, graduates from the proposed BSc program will be able to quickly fill in positions in many organizations looking for entry-level cybersecurity specialists and supports for their increasingly digitalised business modes and daily operations. These jobs are already in high demand, and upon launching the BSc is expected to quickly attract students from CEGEP who are looking for quick entry to the job market upon graduation.

As a comprehensive program covering all theoretical foundations of cybersecurity, the BSc program will also appeal to students who plan to apply for graduate schools directly after obtaining the Bachelors; it can also be combined with existing master's programs at CIISE to offer a fast-track 5-year BSc-MASc/MEng program that will also appeal to many students. In addition, the BSc program can also attract students in, e.g., Electrical Engineering, Computer Engineering, Computer Science, and Software Engineering who are interested in taking cybersecurity as a minor or double major. All these students may be attracted to the BSc program, which will provide a strong complementary source of enrollment to the BEng, especially within the first few years of launching that will quickly bring a positive revenue to the entire program.

In both traditional and emerging sectors (with the wide-spread adoption of information technologies), graduates of a few existing Canadian cybersecurity programs benefit from the high demands driven by growing cybersecurity requirements in both public and private sectors. To further enhance the competitiveness of the BSc graduates, the proposed program aims to be accredited by the Canadian Information Processing Society (CIPS), which will become the 2nd specialized cybersecurity BSc across Canada (after York University). Given the existing teaching and research capacities at CIISE with over 15 faculty members in related areas, the BSc program is expected to be one of the most successful programs in cybersecurity across Canada, especially compared to many other post-secondary institutions that only offer cybersecurity specializations with only 5-8 courses under a general program or a cybersecurity program in colleges and business schools with much less focus on the technical aspects.

The BSc will also benefit from Concordia's unique positioning regarding emerging technologies (e.g., 5G, IoT, Cloud computing, etc.) and applied AI, both of which will be included in the program and will therefore provide uniquely qualified graduates with highly marketable skills. The depth and multi-disciplinary nature of the proposed program also provides many opportunities for research globally, with many cutting-edge developments leveraging novel computational techniques and data science, and increasingly being driven toward secure solutions. These contemporary skills and perspectives also provide increased professional mobility for graduates between economic sectors and job categories.

The government of Canada outlines the career guide in cybersecurity²⁰. As reported, cyber security professionals are

¹⁹ <https://www.publicsafety.gc.ca/cnt/ntnl-scrt/cbr-scrt/cbr-crr-wrnss>

²⁰ <https://www.cyber.gc.ca/en/guidance/cyber-security-career-guide>

in high demand in Canada due to several reasons. First, any device that is connected to the Internet is vulnerable to cyber-attacks. Additionally, there will be estimated 38.6 billion devices Internet-connected devices by 2025²¹. Moreover, cyberattacks happen every 39 seconds²². Furthermore, in 2021, 11% of Canadian businesses were affected by a cybersecurity incident (totalling \$796 million loss)²³. Finally, it is projected that Canadians and Canadian organizations will become more and more victims of cyberthreats in the upcoming years²⁴.

Cybersecurity professionals work in diverse fields and perform important roles including, defending our nation, securing our telecommunications infrastructure, safeguarding our money, protecting our electrical distribution systems, protecting our identities, ensuring our medical information remains private, stopping ransomware attacks, and many more. Stated by the report from the Government of Canada²⁵ graduates of cyber security programs tend to be quickly recruited by public and private sector organizations. The shortage of cyber security professionals is so pronounced (e.g., 25,000 unfilled positions in 2022²⁵) that a skilled graduate of a cyber security program is sure to be an attractive candidate for many employers. Specifically, a cybersecurity graduate can hold entry level positions, such as IT security specialist, Security tester, Incident responder, Cyber security operations analyst, and Vulnerability analyst, as well as other positions with work experience, such as Cyber security researcher, Cyber security engineer, Cyber security architect, Digital forensic analyst, Information system security manager, and Cyber security manager.

Another important factor driving the continuously growing demand for cybersecurity professionals at the bachelor's level is the new cybersecurity regulations and compliance requirements rolling out by federal and provincial governments. For example, the government of Quebec has recently established a dedicated ministry on cybersecurity (Ministère de la Cybersécurité et du Numérique, MCN). The ministry has issued directives on security and information (Directive gouvernementale sur la sécurité de l'information)²⁶ with new information security obligations for public bodies, such as: 1) set up appropriate committees and working groups, 2) ensure management of information security, deploy related security measures, and monitor the implementation, and 3) develop and implement formal, ongoing training and awareness programs for its staff, among others. These new regulations and requirements alone will necessitate the creation and hiring of a dedicated information security management and operation team within each public bodies of the government.

Similar regulations and recommendations are also being rolled out by the federal government through its National Cyber Security Strategy²⁷. In particular, under the new cybersecurity landscape and threats in Canada²⁸, many critical infrastructure sectors and services, such as energy, food, health, manufacturing, and transportation, are facing growing threats. These sectors, however, are significantly less prepared and staffed against growing cyber threats than the information & communication technology and finance sectors. According to the Statistics Canada²⁹, over 25% of enterprises in oil and gas, construction, wholesale trade, rail transportation, banking, higher education, R&D services, and other industries have reported at least one cyber incident in 2021. Such growing demand is widening the cybersecurity talent gap and calling for more trained workforce to fill in the opening positions.

Given the high market demand, the salaries for cyber security professionals are also very competitive. Table 1 shows a summary of the employment of cybersecurity professionals in the US based on the Bureau of Labor Statistics. In 2021,

²¹ <https://www.strategyanalytics.com/access-services/devices/connected-home/consumer-electronics/reports/report-detail/global-connected-and-iot-device-forecast-update>

²² <https://www.securitymagazine.com/articles/87787-hackers-attack-every-39-seconds>

²³ <https://www150.statcan.gc.ca/n1/daily-quotidien/221018/dq221018b-eng.htm>

²⁴ <https://www.cyber.gc.ca/en/guidance/national-cyber-threat-assessment-2020>

²⁵ <https://www.ictc-ctic.ca/news-events/one-in-six-canadian-cybersecurity-roles-go-unfilled-new-report-explores-talent-shortage-and-solutions>

²⁶ https://www.tresor.gouv.qc.ca/fileadmin/PDF/ressources_informationnelles/directives/directive_securite_information2021.pdf

²⁷ <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/ntnl-cbr-scrt-strtg/index-en.aspx>

²⁸ <https://www.cyber.gc.ca/en/guidance/national-cyber-threat-assessment-2023-2024>

²⁹ <https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=2210007601>

the median pay of a cybersecurity professional was \$102,500 per year and \$49.33 per hour. The typical entry level education of those professionals is a bachelor's degree with an average related work experience of less than five years. The total number of posted cybersecurity professional jobs was 163,000. The number is expected to grow over the next ten years (till 2031) with a growth of 35% (which is much faster than the average) with an employment change of 56,500. These statistics clearly demonstrate the growing need of cybersecurity professionals.

Table 4.1. Employment summary for cybersecurity professionals in the US (source: Bureau of Labor Statistics)

2021 Median Pay	\$102,600 per year \$49.33 per hour
Typical Entry-Level Education	Bachelor's degree
Work Experience in a Related Occupation	Less than 5 years
On-the-job Training	None
Number of Jobs, 2021	163,000
Job Outlook, 2021-31	35% (Much faster than average)
Employment Change, 2021-31	56,500

National Occupational Classification (NOC) 2021 Version 1.0³⁰ from the Government of Canada entitles Cybersecurity specialists (21220) along with their main responsibilities and employment requirements.

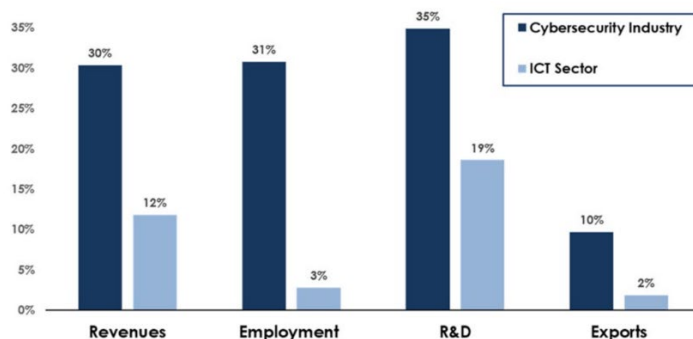


Figure 4.1. Performance of Key Variables, the Canadian Cybersecurity Industry vs. the Broader ICT Sector, (% Change, 2018-2020)

Table 4.2. 2020 GDP Economic Impact of Canada's Cybersecurity Industry

Cybersecurity Industry	Canadian Suppliers to the Cybersecurity Industry	Cybersecurity Industry and Value Chain	Consumer Spending by Associated Employees	Cumulative Total GDP
\$1.6B	\$0.8B	\$2.4B	\$0.8B	\$3.2B

Table 4.3. 2020 Jobs Economic Impact of Canada's Cybersecurity Industry

Cybersecurity Industry	Canadian Suppliers to the Cybersecurity Industry	Cybersecurity Industry and Value Chain	Consumer Spending by Associated Employees	Cumulative Total GDP
14,100 jobs	7,800 jobs	21,900 jobs	7,500 jobs	29,400 jobs

³⁰<https://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=1322554&CVD=1322870&CPV=21220&CST=01052021&CLV=5&MLV=5&adm=0&dis=0>

4.2. Systemic Relevance and Opportunity

The proposed BSc Cybersecurity program is strategically positioned to address the growing demand on cybersecurity engineers who design, construct, and maintain safety and security critical cyber and cyber physical systems which are mandated by the government regulations. This demand has not been adequately addressed by existing programs in Canada and Quebec. In the context of the landscape of cybersecurity programs available in Canada and Quebec, the important and unique value proposition offered by the proposed program is poised to sustain its stable growth.

Table 4.4. Post-secondary cybersecurity related programs in Canada (source: Canadian Centre for Cyber Security).

	Alberta	British Columbia	Manitoba	New Brunswick	Nova Scotia	Ontario	PEI	Quebec	Saskatchewan	Total
Cybersecurity Bachelor's Programs	0	0	0	0	0	2	0	2	0	4
Bachelor's Programs with Cybersecurity Specialization	4	2	0	1	0	4	0	2	0	13
Master's Programs	2	2	0	1	0	8	0	4	0	17
Graduate Certificate/Diploma	9	2	1	1	0	21	3	7	1	45
Certificate, Diploma and Microprograms	12	2	6	5	3	21	2	43	0	94

4.2.1. Cybersecurity programs in Canada

Canada currently offers 4 cybersecurity bachelor's programs, 13 computer science and software engineering bachelor's programs with cybersecurity specializations (concentrations or options), as well as 17 cybersecurity master's programs at 22 universities. Besides the above-mentioned degree programs, there are also a variety of 94 diplomas, certificates, graduate certificates and undergraduate programs offered by CEGEPs, colleges, and universities in 9 provinces. Table 4.4 provides a summary of the numbers of different types of programs offered across provinces in Canada.

Table 4.5 Summary of cybersecurity bachelor's programs and bachelor's programs with cybersecurity specialization in Canada (Other than Quebec)

	Institution	Degree	Credits required in cybersecurity courses
Cybersecurity Bachelor's Programs	Seneca College (ON)	Honours Bachelor of Information Technology – Cybersecurity	60 credit (20 courses) + Co-Op
	Sheridan College (ON)	Honours Bachelor of Information Sciences (Cyber Security)	60 credit (20 courses) + Project
Bachelor's Programs with Cybersecurity Specialization	Concordia University of Edmonton (AB)	Bachelor of Management	12 credits (4 courses)
	MacEwan University (AB)	Computer Science – System and Information Security	12 credits (4 courses)
	The King's University (AB)	Computer Science – Secure Computing Stream	12 credits
	University of Calgary (AB)	Computer Science (Information Security Concentration)	5 courses + 1 Project

British Columbia Institute of Technology	Bachelor of Technology (Digital Forensics and Cybersecurity)	26 credits
British Columbia Institute of Technology	Bachelor of Science (Network Security Applications Development)	15 credits + 1 Project
University of New Brunswick	Computer Science – Cybersecurity specialization	12 credits (4 courses)
Carleton University (ON)	Computer and Internet Security (BSc stream)	2 courses
University of Ontario Institute of Technology	Networking and Information Technology Security (Bachelor of Information Technology)	6 courses + 1 Project
University of Toronto Mississauga	Computer Science (H.B.Sc.) Specialist Program in Information Security	4 courses + 1 Project
York University	Computer Security (BSc)	5 courses + 1 Project
York University	Computer Security (BA)	5 courses + 1 Project

Among others, cybersecurity bachelor’s programs and bachelor's programs with cybersecurity specialization are particularly related to this proposal. Table 4.5 provides a summary of existing cybersecurity bachelor’s programs and bachelor's programs with cybersecurity specialization in the provinces of Canada other than Quebec. We will provide a detailed summary of those programs in the province of Quebec in the next sub-section.

As shown in Table 4.5, outside Quebec, two cybersecurity bachelor’s programs are offered by Seneca College and Sheridan College respectively. These are regular 120 credit bachelor's programs suitable for high school graduates in Ontario school systems. Both programs require 60 credits from cybersecurity courses. The Honours Bachelor of Information Technology – Cybersecurity offered by Seneca College also require co-op. The Honours Bachelor of Information Sciences (Cyber Security) does not only require a cyber security project, not a co-op.

Table 4.6 show the specializations offered in Canadian universities (in both bachelor’s and master’s programs). The most common specialization is information systems security followed by data security and privacy and network security. None except Queen’s master’s program focuses on AI for cybersecurity which might be an essential knowledge for the near future. Additionally, almost no existing bachelor’s programs combine the concept of emerging technologies (e.g., cloud computing, 5G, IoT, blockchains, cyberphysical systems, etc.) with cybersecurity, however, these topics might become the most critical cybersecurity challenges in Canada for the upcoming years.

Table 4.6. Specialization options offered in the Cybersecurity programs in Canada.

	Information Systems Security	Information systems security	Information system assurance	Secure computing	Network security administration	Network Security Applications	Digital forensics	Telecommunications security	Computer and Internet security	Data Security and Privacy	Informatics	Threat intelligence	IT security	Identity management	Governance and auditing	Digital innovation	Infrastructure Protection	Cybersecurity law
Concordia (AB)	1	1	1															
MacEwan (AB)	1																	

King's (AB)				1														
Calgary (AB)	1																	
BCIT (BC)				1	1	1												
NYIT(BC)	1							1	1			1						
Victoria (BC)	1						1											
New Brunswick (NB)	1			1					1						1			
Carleton (ON)								1									1	
Northeastern (ON)	1			1				1	1									
Queen's (ON)	1			1		1									1			
Ryerson (ON)		1							1							1		
Seneca (ON)	1									1	1							
Sheridan (ON)	1																	
Guelph (ON)											1							
Ontario Tech (ON)	1			1								1						
Toronto (ON)	1						1		1				1					
York (ON)								1						1				1
Concordia (QC)	1			1		1			1								1	
Poly Montreal (QC)									1									
UQO (QC)																	1	

4.2.2. Cybersecurity programs in Quebec

Table 4.7 shows the list of Quebec universities and Cégep colleges and the cybersecurity programs and certifications they currently offer. Considering the number of programs offered, it is evident that cybersecurity related programs are popular among Quebec Cégep colleges. As shown in Table 4.7, there are around 40 cybersecurity related programs offering Diploma of College Studies (DCS) and Diploma of College Studies (DCS) in Quebec. Master's programs are offered at Concordia University and Université de Sherbrooke (in French). Graduate certificates, and microprograms are offered at McGill University, HEC Montreal, Laval University, University of Sherbrook, Polytechnique Montréal, and Université du Québec en Outaouais.

Table 4.7 Summary of cybersecurity programs in Quebec

Institute	Program title	Certification
Cégep de l'Outaouais	Techniques de l'informatique - Programmation et Sécurité (in French)	Diploma of College Studies (DCS)
	Techniques de l'informatique - Réseaux et Cybersécurité (in French)	Diploma of College Studies (DCS)
Cégep de Saint-Hyacinthe	Techniques de l'informatique - Réseaux et Cybersécurité (in French)	Diploma of College Studies (DCS)
Cégep de Sherbrooke	Cybersécurité et sécurité intégrée (in French)	Attestation of College Studies (ACS)
Cégep Garneau	Cyberenquête (in French)	Attestation of College Studies (ACS)
	Cybersécurité (in French)	Certificate
Cégep Limoilou	Techniques de l'informatique - Gestion des réseaux (in French)	Diploma of College Studies (DCS)
Cégep Saint-Jean-sur-Richelieu	Administration des réseaux et sécurité informatique (in French)	Attestation of College Studies (ACS)

Champlain College Saint-Lambert	Cybersecurity, Prevention and Intervention	Attestation of College Studies (ACS)
Collège Ahuntsic	Techniques de l'informatique - profil réseaux et sécurité (in French)	Attestation of College Studies (ACS)
	Techniques de l'informatique - profil réseaux et sécurité (in French)	Diploma of College Studies (DCS)
Collège de Bois-de-Boulogne	Techniques de l'informatique - Profil Infrastructures et Sécurité (in French)	Diploma of College Studies (DCS)
Collège de Maisonneuve	Gestion de réseaux et sécurité des systèmes (in French)	Attestation of College Studies (ACS)
	Techniques de l'informatique - Infrastructure et Sécurité des réseaux (in French)	Diploma of College Studies (DCS)
Collège LaSalle	Techniques de l'informatique - Gestion de réseaux et sécurité (in French)	Diploma of College Studies (DCS)
Collège Lionel-Groulx	Administration des réseaux et sécurité informatique (in French)	Attestation of College Studies (ACS)
Collège Montmorency	Prévention et intervention en cybersécurité (in French)	Attestation of College Studies (ASC)
	Techniques de l'informatique - Spécialisation : Réseaux et sécurité informatiques (in French)	Diploma of College Studies (DCS)
Collège Rosemont	Microprogramme de perfectionnement en sécurité des réseaux (in French)	Attestation of College Studies (ACS)
	Techniques de l'informatique - Profil réseautique : sécurité et virtualisation (in French)	Diploma of College Studies (DCS)
Concordia University	Information Systems Security (MAsc)	Masters
	Information Systems Security (MEng)	Masters
	Cybersecurity Proficiency	Certificate
Cumberland College	Cybersecurity Specialist	Attestation of College Studies (ACS)
HEC Montréal	Analyse d'affaires - cybersécurité	Certificate
	Analyse d'affaires - cybersécurité (in French)	Microprogram
	Analyse d'affaires – Technologies de l'information (in French)	Diploma of Higher Specialized Studies (DESS)
	Transformation numérique des organisations (in French)	Masters
Heritage College	Microsoft Network and Security Administrator	Attestation of College Studies (ACS)
Institut supérieur d'informatique	Computer Networks and Security	Attestation of College Studies (ACS)
	Réseaux Informatiques et Sécurité (in French)	Attestation of College Studies (ACS)
Kensley College	Cyber Security and Ethical Cyber Piracy	Attestation of College Studies (ACS)
McGill University	Applied Cybersecurity	Certificate (online)
	Cybersecurity	Graduate Certificate
Polytechnique Montréal	Analysis and operational cybersecurity (in French)	Undergraduate Certificate
	Architecture et gestion de la cybersécurité (in French)	Certificate
	Cyberenquête (in French)	Certificate
	Cyberfraude	Certificate
	Internet industriel des objets	Certificate
	Security and Computer Mobility	Bachelor's in Computer Engineering
	Security and Mobility in Software	Bachelor's in Software Engineering
	Cybersecurity (in French, for computer professionals)	Cumulative Bachelor's
	Cyberinvestigation (in French)	Microprogram
	Internet industriel des objets	Microprogram
	Networking and Security (in French)	Microprogram
	Réseautique et sécurité (in French)	Microprogram
	Cybersécurité (in French)	Professional Graduate Certificate

Université du Québec en Outaouais	Gouvernance et cybersécurité (in French)	Certificate
	Innovation numérique (in French)	Cumulative Bachelors
	Réseaux informatiques et cybersécurité (in French)	Certificate
	Certificat en gestion de technologies d'affaires (in French)	Certificate
	DESS en gestion de technologies d'affaires (in French)	Certificate
Université Laval	Administration des affaires – gouvernance de la sécurité de l'information (in French)	Graduate Certificate
Université de Sherbrooke	Gouvernance, audit et sécurité des technologies de l'information (in French)	Diploma of Higher Specialized Studies (DESS)
	Gouvernance, audit et sécurité des technologies de l'information (in French)	Microprogram
	Gouvernance, audit et sécurité des technologies de l'information (GASTI) (in French)	Masters
	Sécurité informatique (in French)	Diploma of Higher Specialized Studies (DESS)
	Sécurité informatique – volet prévention (in French)	Microprogram
	Sécurité informatique – volet réaction (in French)	Microprogram

Closely related to the proposed BSc. program, in Québec, two universities (École Polytechnique, and Université du Québec en Outaouais) currently offer cumulative bachelor's degrees in cybersecurity. In addition, these universities also offer bachelor's degrees in computer engineering, software engineering, and computer science with cybersecurity specialization. Table 4.8 provides a detailed summary of cybersecurity bachelor's programs and bachelor's programs with cybersecurity specialization offered at Quebec universities.

Table 4.8 Detailed summary of cybersecurity bachelor's programs and bachelor's programs with cybersecurity specialization offered at Quebec universities.

	Institution	Degree	Program Structure	Suitable Applicants
Cybersecurity Bachelor's Programs	Polytechnique Montréal	Accumulative Bachelor's in Cybersecurity (in French, must be admitted to one of the certificate programs first. Cannot apply directly to the cumulative bachelor's degree).	3 certificates in cybersecurity (30 credits each). At least two of them offered at Polytechnique Montréal. Program offered online.	Intended for IT professionals who want to equip themselves with concrete tools to work in the field of cyber security. - Hold or be in the process of obtaining a college diploma (DCS) in a computer science field. - Attestation of Collegial Studies (ACS) AND at least two (2) years' relevant experience
	Université du Québec en Outaouais	Accumulative Bachelor's in Innovation numérique (in French, must be admitted to one of the certificate programs first. Cannot apply directly to the cumulative bachelor's degree).	Management stream, 3 undergraduate certificates, 30 credits each. Two certificates in Administration, Governance and Cybersecurity, and Business Technology Management. And a third certificate from Computer Networking and Cybersecurity and Information Technology	Holders of D.E.C or 30 credits in a university program.

Bachelor's Programs with Cybersecurity Specialization	Polytechnique Montréal	Bachelor's in Computer Engineering -Security and Computer Mobility (in French)	27 credits, last year concentration 5 courses required +Project 2 grad level elective courses	Holders of D.E.C or 30 credits in a university program.
	Polytechnique Montréal	Bachelor's in Software Engineering - Security and Mobility in Software (in French)	27 credits, last year concentration 5 courses required +Project 2 grad level elective courses	
	Université du Québec en Outaouais	Bachelor's in Computer Science (in French, with Co-Op option)	90 credits 18 credits cybersecurity courses	Holders of D.E.C or 30 credits in a university program.

École Polytechnique offers a Bachelor of Cybersecurity via accumulation of certifications. This cumulative bachelor's degree is based on undergraduate certificates offered on cyber investigation, cyber fraud, IIoT, analysis and operational cybersecurity, and cybersecurity. The degree requirement is to complete at least two certificates offered at École Polytechnique. A third certificates can be obtained from pre-selected certificate programs offered at HEC Montreal and University of Montreal. The program is Intended for IT professionals who want to equip themselves with concrete tools to work in the field of cyber security. Applicants to the program should have completed fundamental computer science courses through computer science college diploma or related working experiences.

In addition to the accumulative Bachelor of Cybersecurity offered at École Polytechnique, Université du Québec en Outaouais offers an accumulative Bachelor's in Innovation Numérique which can be tailored to a cybersecurity bachelor's program which allows students to select two certificates which can cover 60 credits in cybersecurity courses. However, the courses are designed to accommodate the background of management stream students.

In terms of bachelor's programs with cybersecurity specialization, Université du Québec en Outaouais offers a Bachelor's in Computer Science with specialization in Computer Networks and Cybersecurity. This specialization includes courses in system security as well as cybersecurity governance. The students completed at least 30 credits in their bachelor's are eligible to enrol for this specialization. Even though this helps the students to obtain cybersecurity concentrations on specific skills, this initiative does not provide a complete bachelor program in cybersecurity covering its multi facets. École Polytechnique offers both Computer Engineering and Software Engineering bachelor programs with specialization in cybersecurity. Both programs require 30 credits in cybersecurity courses for graduates to specialize in cybersecurity.

4.2.3. The market position of the proposed cybersecurity BSc program

Our detailed environmental scan and analysis of the landscape of cybersecurity related programs offered at Canadian universities and colleges revealed several gaps in the market, presenting important opportunities for new programs. In the following, we provide a detailed description of these gaps and explain how our proposed cybersecurity BSc. program can uniquely position itself among related programs in the Canadian market by leveraging our existing resources and unique strengths in the field to capitalize on those opportunities.

1. Bachelor's program in cybersecurity is underrepresented in the Province of Québec and in Canada. Despite relatively large number of cybersecurity related college diplomas, undergraduate and graduate certificates offered in Canada, in total, only four bachelor's programs in cybersecurity are available in the Canadian market. Specifically, two of them offered at Quebec universities are accumulative bachelor's programs. Only two Ontario colleges offer dedicated regular cybersecurity bachelor programs in Canada. In contrast, there are more than 200 bachelor's degrees in cybersecurity offered in USA³¹. As such, bachelor's program in

³¹ <https://cybersecurityguide.org/programs/cybersecurity-bachelors-degree/#Schools>

cybersecurity is underrepresented in Canada. The outcomes of our industry expert survey also clearly support this observation.

The two cybersecurity accumulative bachelor's programs are offered at Polytechnique Montréal and Université du Québec en Outaouais. These programs emphasize on certificate training and targeting IT professionals and students who already have computer science diplomas and/or related working experience. They have a different targeted student population than that of the proposed B.Sc. Program. Two Ontario colleges namely Seneca College and Sheridan College offer regular cybersecurity bachelor's programs targeting high school graduates. The cybersecurity courses designed for these programs focus more on specific tools and platforms commonly used in the industry with rather narrow scopes and limited exposure to the fast-evolving body of cybersecurity theories and advanced approaches.

Compared to these programs, our proposed B.Sc. program has much broader coverage of different aspects of cybersecurity and cutting-edge cybersecurity technologies. In addition to hands on experiences, the design of our courses also equips students with deeper understanding of the subject matters at theory level, which empowers students to develop their understanding and skills with the evolution of the technologies and challenges in the field.

Concordia has several unique advantages in the development of a new undergraduate program with unique value propositions to the potential students in Canada and abroad. Benefiting from a very well-established leading cybersecurity research group in the country, we can offer courses with broader coverage and in several cutting-edge disciplines, including IoT, cloud computing, telecommunications, financial crypto, AI for cybersecurity. These areas reflect the uniqueness of Concordia's offering by providing advanced and applied topics in cybersecurity. These areas give competitive advantage for Concordia students by advancing their knowledge in key strategic areas for the future of cybersecurity and are rare or unique specialty tracks in other Canadian universities. We have the expertise in the faculty members to offer courses cover all specializations listed in Table 4.6. We can also maintain favorable student/faculty ratio in the program supported by a group of 13 faculty members available for teaching specialized cybersecurity courses and other faculty members available for teaching general theory and math courses.

Compared with these cybersecurity specializations, the proposed B.Sc. program requires more than 60 credits in cybersecurity courses, which provides a much broader and rigor treatment to the subject. The diverse topics offered include information system assurance, information systems security management, system and information security, secure computing, network security administration, network security applications development, digital forensics, telecommunications and information security, computer and Internet security, data security and privacy, informatics and security, threat intelligence, IT security, identity, privacy and security (IPS), governance and auditing, digital innovation. Leveraging the strong capacity of CIISE faculty members in a wide range of theoretical and practical topics, we will offer a unique program to students looking to work in a variety of emerging areas in cybersecurity, such as application of machine learning and artificial intelligence (AI) to cybersecurity, critical infrastructure security, and cybersecurity in Industry 4.0 and IoT.

2. A strong co-op program is critical in terms of providing students with the necessary working experiences needed by the potential employers.

The bachelor's programs with cybersecurity specializations listed in Table 4.5 usually require 4 to 5 cybersecurity courses to complete a cybersecurity specialization³². The program structure of a general degree

³² With the exception of the Bachelor of Technology (Digital Forensics and Cybersecurity) offered by the British Columbia Institute of Technology. This program requires 26 credits in cybersecurity related courses. However, this program focuses more on digital forensics, which is not the main focus of a regular cybersecurity undergraduate program.

program with cybersecurity specialization obligates the cybersecurity specialized courses to be scheduled towards the end of the program. In most of the cybersecurity specializations listed in Table 4.5, cybersecurity courses are scheduled for the last year the bachelor's program in the format of technical elective courses, which makes it difficult for these programs to offer cybersecurity co-op internships to the students.

In contrast, the structure of the proposed BSc program has clear advantages over the general degree with cybersecurity specialization programs in terms of providing strong co-op experiences for students to integrate modern skill capacity development for an evolving job market. The proposed B.Sc. program systematically introduces cyber security courses along the years, which allows students to participate in multiple cybersecurity co-op internships in their program, which will be very valuable for preparing students for the cybersecurity job market. The CIISE department is successfully hosting two master's programs (MAsc and MEng) in information systems security since 2003 with significant increase in its enrolment and strong impact on the community over the years. Our alumni are holding vital positions in both public and private sectors and both in practice and academia, which provides important resources for supporting out co-op programs. In addition, CIISE currently has 13 faculty members working on cybersecurity research, four of them are NSERC Industrial chairs in cybersecurity. Given its strong cybersecurity profile and industry connection established by the cybersecurity research group within the institute, the proposed program is poised to provide students with rich and rewarding co-op experiences.

4.2.4. Partnerships and Collaborations

Foreseeable links to related programs, potential collaborations between professors in the new program and related ones in other institutions. The proximity of McGill University and École Polytechnique to Concordia University creates favourable conditions for collaborations with professors in these institutions. Furthermore, there is a history of collaboration between engineering professors at these three universities.

Research groups of particular interest are:

- From McGill University: Dr. Benjamin Fung (artificial intelligence (AI) applications for cybersecurity), Dr. Zeljko Zilic (applied cryptography and blockchain), Dr. Steven H. H. Ding (malware analysis), and others.
- From École Polytechnique Montréal: Dr. Nora Boulahia Cuppens (cryptography and intrusion detection), Dr. Frédéric Cuppens (risk analysis and network security), and others.
- From the Department of Computer Science and Software Engineering: Dr. Emad Shihab (software engineering and management), Dr. Jinqiu Yang (automated program repair), Dr. Peter C. Rigby (software engineering practices), Dr. Abdelhak Bentaleb (cloud computing, Internet of Things), and others
- From the Department of Electrical and Computer Engineering: Dr. Otmane Ait Mohamed (formal verification), Dr. Walaa Hamouda (physical layer security), Dr. Kash Khorasani (cyber physical security), and others.

At master's level training, CIISE is partnering with Department of Electrical and Computer Engineering to develop a new MEng. program in Cyber Physical and Critical Infrastructure Systems & Security. This joint master's program will leverage the expertise from both departments to train next-generation practitioners and researchers in Cyber Physical and Critical Infrastructure Systems & Security, which are highly demanded in today's industry digitalization economy.

The Security Research Center (SRC) at Concordia University also partnered with other institutions to conduct cybersecurity training of professionals. Notable collaboration includes the training programs for the Ministère de la Cybersécurité et du Numérique (MCN), Ericsson Canada, Hydro Québec, and Deloitte.

In addition to professional trainings, the SRC, which hosts all CIISE professors working on cybersecurity, has established a longstanding tradition of collaborative R&D with industrial partners. For example, Concordia and Ericsson have collaborated on numerous projects over the years. In a recent project funded by the National Cybersecurity Consortium (NCC) under the Cyber Security Innovation Network (CSIN), researchers from CIISE partner with communications technology company Ericsson and researchers from Concordia, the University of Waterloo and the University of Manitoba to build cyber resilient and secure 5G network through automation and AI. The project will

receive \$1 million from the NCC over three years. Matching funds of \$1.2 million will come from Concordia, Ericsson and the University of Manitoba.

In addition to cybersecurity, professors from CIISE also build partnerships and collaborations with governments and organizations in the domain of cybersecurity. For example, CIISE is currently home to seven active research chairholders in critical infrastructure security, including four NSERC Industrial Research Chairs, one Tier-2 Concordia University Research Chair, one Tier-2 Concordia University Research Chair, and one Gina Cody Research Chair, who led multiple edge-cutting research collaborative projects with partners from industry with over \$8 million external research funds:

- 1) Mourad Debbabi, NSERC/Hydro-Québec/Hitachi Senior Industrial Research Chair in Smart Grid Security (\$2.3 million between 2016-22; renewed in 2023)
- 2) Lingyu Wang, NSERC/Ericsson Senior Industrial Research Chair in Software-Defined Networking and Network Functions Virtualization Security (\$1.8 million)
- 3) Jeremy Clark, NSERC/Raymond Chabot Grant Thornton/Catallaxy Industrial Research Chair in Blockchain Technologies (\$1.38 million)
- 4) Roch Glitho, NSERC/Ericsson/ENCQOR 5G Senior Industrial Research Chair in Cloud and Edge Computing for 5G and Beyond (\$2.67 million)
- 5) Chadi Assi, Concordia University Research Chair (Tier 1) in Broadband Wireless Networks
- 6) Jun Yan, Concordia University Research Chair (Tier 2) in Artificial Intelligence in Cyber Security and Resilience
- 7) Carol Fung, Gina Cody Research Chair in IoT/Cybersecurity

The R&D partnerships held by these chairs include various key stakeholders in cybersecurity, including the Government of Quebec, Autorité des marchés financiers (AMF), Public Safety Canada, Department of National Defence (DND), Office of Privacy Commissioner (OPC), Hydro-Quebec, Ericsson, Ciena, Rheinmetall, and many others.

Smart, sustainable, and resilient cities and communities is another research area in which CIISE professors have partnerships and collaborations with various organizations. For example, Dr. Chun Wang is a co-cluster director at Concordia's Next-Generation Cities Institute focusing on Mobile, Secure and Sharing Cities. Other professors, for example, Drs. Chadi Assi, Jun Yan, Nizar Bouguila, Manar Amayri, and Mohsen Ghafouri also have collaborative projects with Next-Generation Cities Institute in the areas of digitalization, cybersecurity, AI, smart and secure building, smart and secure transportation and mobility.

The program will also collaborate with several organizations to ensure its better engagement with the underrepresented community in the field of cybersecurity. In particular, the Women in CyberSecurity (WiCyS) Concordia chapter will work with its other chapters to announce the news of this new program about enrolment, admission, scholarships, etc., and to ensure broader outreach of this program. Similar initiatives will also take place in collaboration with Annual Canadian Celebration of Women in Computing Conference (CAN-CWiC) and other similar events.

These long-term partnerships and collaborations will provide a rich environment for providing hands-on training and experiential learning opportunities for the proposed undergraduate cybersecurity program which makes the program unique and attractive.

4.3. Institutional Relevance and Opportunity

Concordia University has defined nine strategic directions for a next-generation academic institution, four of which come through strongly in the creation of the proposed program:

Teach for tomorrow – Exposing students to realistic industry projects, expertise, and working environments through our strong partnerships and collaborations with the industries and governments provides tremendous value to training next-generation cybersecurity engineers. Virtual labs and other online learning modules provide students with multiple opportunities to gain experience and interact with the up-to-date and dynamic cyberworld. This provides the skills, knowledge, and tools for graduates to adapt to a variety of working, learning, and creating environments.

Get your hands dirty – Concordia enjoys a strong and robust experiential learning office, which will expand to meet the needs of the cybersecurity engineering undergraduates and thus provide fulfilling opportunities for hand-on learning. In addition, given the strong industry collaboration and research foundation of CIISE, undergraduate students can be recruited to work on a variety of industry sponsored projects by faculty members in the department. Students will have first-hand experience in understanding the need, scope, and complexity of the design, development, testing and maintenance of cyber and cyber-physical systems.

Grow smartly – Based on the current and future market demand for cybersecurity engineering education opportunities in Québec, enrolment in cybersecurity engineering is expected to quickly increase to match the explosive growth of cyberspace and digitalization of physical space, such as digital twin. The projected enrollment found in Section 4.1 shows a rapid increase from 50 students initially, to a mature annual enrollment of 100 students.

Embrace the city, embrace the world – As the sustainability of the cities increasingly rely on digitalization to improve resource utilization and coordination, the proposed undergraduate program can have a strong focus on the security aspects of digitalized cities and the world enabling interdisciplinary connections and outreach to exhibit novel approaches and solutions for contemporary problems. For example, the blockchain knowledge built by the program can prepare students to design tracking and auditing methodologies in the areas of pollution control, climate change mitigation, energy transition.

The program will be complementary to existing programs at Concordia University. The programs most closely related to the proposed BSc in Cybersecurity are the Bachelor's in Computer Science program. The overlap with these programs will be roughly one year (30 credits). Discussions with other departments will be held and courses will be shared with these programs whenever this makes sense.

Successful undergraduate program builds solid foundation and provides tremendous benefits to the cybersecurity research activities at Concordia by training talents in the domain early on, attracting top students to graduate programs, and build strong alumni communities which foster research collaborations with the industries. Concordia University's Strategic Research Plan 2023-2028 identifies four thematic areas that engage our research community and our partners in solving fundamental questions and finding innovative solutions to several pressing societal challenges. The proposed undergraduate program is closely related to several sub-thematic areas such as cybersecurity, cyberphysical systems, communications technologies, climate change and sustainability, medical devices, critical infrastructure.

Concordia has prioritized research in disciplines and domains that accelerate progress towards decarbonized and resilient economies, cities, and communities through electrification research. CIISE professors are also actively involved in the Electrification Decarbonization and Resilient Communities Canada First Research Excellence Found initiative led by Concordia university. Power grid efficiency and security, secure integration of new technologies for smart grid, secure integration of electrified transportation, charging infrastructures and smart buildings are the conner stone of the electrification of the society. Several professors, namely Drs. Chadi Assi, Jun Yan, Nizar Bouguila, Manar Amayri, Mohsen Ghafouri, Chun Wang, Amin Hamed, have responded to the first EDRC seed call by submitting project proposals either as PIs or co-PIs. These projects demonstrate strong and on-going collaborations with researchers and other institutes within and outside Concordia and a variety of industry partners.

With the proposed undergraduate program in place, Concordia will only broaden its impact on the electrification of the cities and societies by leveraging its already established research and training capabilities in critical infrastructure security and secure integration of power, electrified transportation, renewable energy resources and smart buildings.

5. PROGRAM OBJECTIVES

The purpose of the proposed program is to train cybersecurity professionals with valuable skills for a broad range of industrial, government, and non-profit sectors in Quebec and worldwide, who will close talent gaps and drive economic growth by ensuring the security of cyber systems, IOT systems, and critical infrastructures on which we build our modern digital and physical economy.

- Apply technical knowledge in engineering, natural science, mathematics, and computer science to generate novel solutions to problems in industry and society, including the design or maintenance of information systems for various industries in our digital economy.
- Analyse processes and systems through a lens of system level security, dependability and equity to fully comprehend the economical and social impacts of various design decisions, and prioritize professional ethics and accountability in decision making.
- Earn an advanced degree or certification for the purpose of pursuing a career in academia or teaching, law, medicine, finance, research and development, or entrepreneurship; or become licensed as an engineer.
- Propensity to continuously search for new knowledge, learn new skills, and become proficient in new and advanced engineering tools.

6. REGULATORY FRAMEWORK

6.1. Admission Requirements and Processes

A summary of the admission requirements and processes at the GCS is given here; for further description of the admission requirements and processes for Concordia University please consult the following sections of the Undergraduate Calendar (UC): general admissions in Section 13³³; and GCS admissions in Section 71.10³⁴. The UC is available online.

6.1.1. General Admission Requirements

All applications to Concordia University go through a single processing center. Quebec applicants must: 1) successfully complete a two-year pre-university program in a CEGEP and qualify for a Diploma of Collegial Studies (DEC) or the equivalent, 2) have completed a three-year professional program in a CEGEP, or 3) have obtained a French or International Baccalaureate. Graduates from secondary schools in Canadian provinces and territories outside Quebec are considered for admission to the Extended Credit Program (ECP), which requires students to take 30 credits in addition to the regular program requirements. Transfers from other universities are possible. Applicants from outside of Canada are eligible, with further information available in Section 19 of UC³⁵. At the time of application, students can identify whether they would like to be considered for the co-operative education program.

The language of instruction at Concordia University is English, while most assignments and examinations may be submitted in French. Students whose first language is not English must demonstrate language proficiency prior to admission through achieving the appropriate score on one of five standardized English tests (Test of English as a Foreign Language, etc.) if they do not satisfy any of the exemption criteria.

6.1.2. Gina Cody School of Engineering and Computer Science (GCS) Admission Requirements for BSc

For Quebec applicants, there is a required CEGEP course profile of Mathematics 201 (103 or 201-NYA and 203 or 201-NYB and 105 or 201-NYC). As mentioned above, out-of-province applicants are considered for the ECP program if they do not have sufficient pre-university education (e.g., International Baccalaureate). As mentioned in the previous section, students in the ECP program must take 30 additional credits. The required courses are listed in Section 71.20.2 of the UC and consist of a foundation in mathematics (9 credits), physics (6 credits), and chemistry (3 credits), as well as some electives in natural sciences (6 credits), humanities and social sciences (6 credits). Mature entry admission requirements are available in Section 14 of the UC.

6.1.3. Cybersecurity BSc Admission Requirements

Specific grade requirements for the program will be determined after the Curriculum Committee (defined in Section 6.3.1 of this document) evaluates the applications received, but are expected to be relatively in line with the grade requirements of the BCompSC³⁶, which are summarized below:

- Quebec CEGEP: 28 overall (R-score) and if taken, 26 in math.
- High school: A- overall, A- in math
- Indigenous Bridging: First Nations, Inuit and Métis students who do not meet Concordia's conventional admission requirements may be eligible for admission through the Kaié:ri Nikawerà:ke Indigenous Bridging Program.
- International Baccalaureate: 33 overall, 5 HL or 6 SL math.
- French Baccalaureate: 15 overall, 15 in math

³³ <https://www.concordia.ca/academics/undergraduate/calendar/current/section-13-admission-regulations.html>

³⁴ <https://www.concordia.ca/academics/undergraduate/calendar/current/section-71-gina-cody-school-of-engineering-and-computer-science.html>

³⁵ <https://www.concordia.ca/academics/undergraduate/calendar/current/section-19-international-students.html>

³⁶ <https://www.concordia.ca/academics/undergraduate/computer-science.html>

- British system of education (GCE):
 - A-levels: At least two A-level exams AB, A in math; or
 - AS-levels: At least 4 AS-level exams with equivalent results; or
 - BTEC: Level 3 Diploma or Extended Diploma in a related subject area with equivalent results.
- University transfer (internal): 3.0 overall, 3.0 in math, 2.3 in courses offered by GCS.
- University transfer (external): A- overall, A- in math.

6.2. Commitment and structure of the program

The program is 90 credits, with 30 courses, for full time studies with a duration of 3 years. Exceptions are the ECP described in the previous section, requiring 30 additional credits.

Mandatory credits (30 courses, 90):

1. Cybersecurity Core Courses: 17 courses (52.5 credits)
2. Cybersecurity Elective Courses: 3 courses (9 credits)
3. Elective Courses
 - a. Mathematics Elective Courses: 3 courses (9 credits)
 - b. General Elective Courses: 7 courses (minimum 19.5 credits)

For further information on the program structure, please refer to the student paths in Section 7.3.

The cybersecurity core includes courses which address:

- Science Knowledge: solid foundation in mathematics, computer software, and network systems.
- Cybersecurity Engineering Fundamentals: cryptography, foundations for secure information systems, access control, security policies and security mechanisms, operating system security, network security, security vulnerabilities and malware defense, secure programming, cybersecurity ethics.
- Experiential learning: courses incorporating practice in theory.

The cybersecurity elective courses allow students to concentrate in the following subjects:

- Blockchain technology, cybersecurity ethics, cybercrime investigations, privacy.

The general elective courses allow students to further broaden their knowledge in mathematics, engineering, science and humanity, which prepare them for a variety of roles related to cybersecurity in the economy.

Two optional activities, with no credit value, will supplement the proposed curriculum:

- **Internships through the Concordia Institute for Co-operative Education:** All students will have the opportunity to apply to be a member of the Institute and take part in their Undergraduate Co-op Program, Career Edge (C. Edge) Program, or Accelerated Career Experience (ACE) Program
- **Summer Internships:** Concordia research institutes (e.g., Concordia Security Research Centre) or industrial partners (e.g., Ericsson, Hydro-Québec) can provide research or industry internships. Some professors will also hire undergraduate interns via the Mitacs Accelerate program. NSERC Undergraduate Student Research Awards and Concordia Undergraduate Student Research Awards will also be offered to students who are interested in research focused internships.

6.3. Program oversight

6.3.1. Leadership and composition of the Program Committee

The proposed program aims to follow the accreditation procedures for BSc programs of the Canadian Information Processing Society (CIPS). Like the BEng program, the Curriculum Committee for the BSc will be led by an Undergraduate Program Director and consist of 6 members, which can be overlapping with the curriculum committee for the BEng. The Associate Director of CIISE, who is responsible for managing the master's level co-op program in the department

will collaborate with the Institute for Co-operative Education to recommend admissions to the Institute, keep track of GPA adherence, and grade work term reports. This Associate Director will also have a spot on the Curriculum Committee to provide valuable feedback on student experiences during their work terms. The Curriculum Committee will be responsible for reviewing student feedback on courses, preparing documents for accreditation visits from CIPS, making recommendations for program admissions, and proposing changes to the curriculum. Any aspects outside of curriculum management will be addressed by the Department Council under the advisement of the Undergraduate Program Director. The Concordia University Part-Time Faculty Association (CUPFA) will appoint a member to advise the Curriculum Committee.

The Undergraduate Program Director will receive half a course remission (1.5 credits) before the program starts. Each of the Undergraduate Program Director and Associate Director (Co-operative Education) will receive a full course remission each year when the program starts. This is part of the budget in Section 10 and in Appendix 11.

The first Curriculum Committee of the BSc in Cybersecurity is proposed to be composed of:

- Prof. Chun Wang
- Prof. Yong Zeng
- Prof. Amr Youssef
- Prof. Lingyu Wang
- Prof. Mohammad Mannan
- Prof. Jeremy Clark
- Prof. Jun Yan
- Prof. Suryadipta Majumdar

6.3.2. Study Regulations

Students enrolled in the proposed program will be subject to the Academic Regulations defined by the university (Section 16 of the UC) and by the GCS (Section 71.10.4 of the UC), both available online.

6.3.3. Collaborative Arrangements with other Units, Departments, Faculties, and Institutions

CIISE is actively engaged with other departments, faculties, and research centers within the institution. All these established relationships will contribute to the vitality of the BSc program. CIISE professors regularly teach courses in the Departments of Electrical and Computer Engineering, Computer Science and Software Engineering at both undergraduate and graduate levels. For instance, Prof. Chadi Assi, Prof. Arash Mohammadi, Prof. Chun Wang, and Prof. Jun Yan teach offerings of COEN 231 Introduction to Discrete Mathematics. Prof. Glitho also teaches ENCS 691 in the Department of Computer Science and Software Engineering. Professor Amr Yousef and Mohammed Mannan also teach SOEN courses in the Department of Computer Science and Software Engineering. CIISE professors also teach service courses, valuable to the faculty as a whole. These include ENCS courses taught by Prof. Walter Lucia and Prof. Mohsen Ghafouri. We expect that our faculty members will continue to teach undergraduate level courses in other departments, especially those adopted in our new BSc program.

Professor Mourad Debbabi is the director of the Security Research Centre, a multi-disciplinary center with 18 full members from six departments with diverse interests. The research center facilitates the interaction of security related researchers across departments, which will also provide critical resources in terms of teaching staff, research facilities, laboratories, and collaborations with industry partners.

CIISE is also developing a new inter-department MEng in Cyber-Physical and Critical Infrastructure Systems & Security with the Department of Electrical and Computer Engineering. Once approved, this program will provide the graduates of the BSc in cybersecurity with the option of continuing their studies at master's level.

Shared supervision of graduate students commonly occurs with the Department of Computer Science and Software

Engineering (CSSE) and the Department of Electrical and Computer Engineering (ECE). CIISE professors also independently supervise students in other departments, including the above-mentioned departments, the Department of Building, Civil, and Environmental Engineering (BCEE), and Mechanical and Industrial Engineering.

7. PROGRAM STRUCTURE

7.1. Activities

7.1.1. *Mandatory and Optional Courses*

The proposed degree is a full-time program offering 30 courses, corresponding to 90 credits in total, which are allocated to five groups of courses:

- 22.5 credits (8 courses) from the Cybersecurity Core,
- 30 credits (9 courses) from the Cybersecurity Complementary Core courses,
- 9 credits (3 courses) of Cybersecurity Electives,
- 9 credits (3 courses) of Mathematics Electives: BSc Cybersecurity
- 19.5 credits (7 courses) of General Electives: BSc Cybersecurity

Table 7.1 provides a detailed list of the cybersecurity core and complementary core courses that the students must select. Table 7.2 provides a list of the BSc in Cybersecurity elective courses, among which students shall select at least 9 credits. Table 7.3 provides a list of Mathematics elective courses for the BSc in Cybersecurity, among which students shall select at least 9 credits. Table 7.4 summarizes the options for the General elective courses for the BSc in Cybersecurity, among which students shall select 19.5 credits from the General electives. All the courses with INSE course codes are new courses proposed to be developed for the degree program. Some of the cybersecurity electives are cross listed with existing graduate level courses, which is indicated in Appendix 3.

Table 7.1. List of the cybersecurity core and complementary core courses for the (52.5 credits).

BSc in Cybersecurity Core Courses (22.5 credits)	Courses	Credits
		INSE 201 Security Ethics, Laws, Standards & Compliance
	INSE 221 Cryptography I	3.0
	INSE 321 Cryptography II	3.0
	INSE 331 Database Security	3.0
	INSE 349 Secure Programming and Software Design	3.0
	INSE 351 Operating System security	3.0
	INSE 413 Security Auditing and Compliance	3.0
	INSE 445 Network Security	3.0
BSc in Cybersecurity Complementary Core Courses (30 credits)	Courses	Credits
	COMP 228 System Hardware	3.0
	COMP 232 Mathematics for Computer Science	3.0
	COMP 248 Object-Oriented Programming I	3.5
	COMP 249 Object-Oriented Programming II	3.5
	COMP 346 Operating Systems	4.0
	COMP 348 Principles of Programming Languages	3.0
	COMP 352 Data Structures and Algorithms	3.0
	COMP 445 Data Communications & Computer Networks	4.0
	ENCS 282 Technical Writing and Communication	3.0

Table 7.2. BSc in Cybersecurity Elective Courses (at least 9 credits)

Courses	Credits
INSE 390 Cybersecurity Engineering Team Design Project	3.0
INSE 401 Usability and Human Aspects of security	3.0
INSE 411 Privacy: Enhancing Technologies, Analysis and Measurement	3.0
INSE 412 Cybercrime and Digital Forensics	3.0
INSE 441 Mobile Application Security and Privacy	3.0
INSE 442 Reverse Engineering, Application and Malware Analysis	3.0
INSE 452 Penetration Testing and Ethical Hacking	3.0
INSE 481 Blockchain Technologies and Applications	3.0
INSE 482 Industrial Control Systems and Critical Infrastructure Security	3.0
INSE 483 IoT and Embedded System Security	3.0
INSE 484 Quantum Computing and Security	3.0
INSE 485 Cybersecurity of Healthcare Systems and Devices	3.0
INSE 486 Cybersecurity Management and Governance	3.0
INSE 490 Capstone Cybersecurity Engineering Design Project	6.0
INSE 498 Topics in Cybersecurity Engineering	3.0

Table 7.3. Mathematics Electives: BSc Cybersecurity (at least 9 credits)

Courses	Credits
ENGR 213 Applied Ordinary Differential Equations	3.0
ENGR 233 Applied Advanced Calculus	3.0
ENGR 371 Probability and Statistics in Engineering	3.0
ENGR 391 Numerical Methods in Engineering	3.0
MAST 218 Multivariable Calculus I	3.0
MAST 219 Multivariable Calculus II	3.0
MAST 221 Applied Probability	3.0
MAST 324 Introduction to Optimization	3.0
MAST 332 Techniques in Symbolic Computation	3.0
MAST 333 Applied Statistics	3.0
MAST 334 Numerical Analysis	3.0
MATH 251 Linear Algebra I	3.0
MATH 252 Linear Algebra II	3.0
MATH 339 Combinatorics	3.0
MATH 366 Complex Analysis I	3.0
MATH 392 Elementary Number Theory	3.0

Table 7.4. General Electives: BSc Cybersecurity (19.5 credits combined)

Groups	Description
Mathematics Electives: BSc Cybersecurity	See Table 7.3
General Education Electives	List of courses found in Undergraduate Calendar Section 71.110 - Complementary Studies for Engineering and Computer Science Students

* A course outside this list qualifies as a General Elective provided that the course is explicitly listed in the Undergraduate Calendar as part of a major, minor, or specialization program, or as part of the degree requirements for a BEng program at Concordia, and provided that the course is not included in the General Electives Exclusion List below.

General Electives Exclusion List

1. The following courses may not be taken to fulfill the General Electives requirement:
 - BCEE 231 Structured Programming and Applications for Building and Civil Engineers (3.00)
 - BIOL 200 Fundamentals of Human Biology (3.00)
 - BIOL 322 Biostatistics (3.00)
 - BTM 200 Fundamentals of Information Technology (3.00)
 - BTM 380 Introduction to Business Application Development (3.00)
 - BTM 382 Database Management (3.00)
 - CART 315 Digital Game Prototyping (3.00)
 - COMM 215 Business Statistics (3.00)
 - COMP 218 Fundamentals of Programming (3.00)
 - EXCI 322 Statistics for Exercise Science (3.00)
 - GEOG 264 Programming for Environmental Sciences (3.00)
 - INTE 296 Discover Statistics (3.00)
 - MATH 208 Fundamental Mathematics I (3.00)
 - MATH 209 Fundamental Mathematics II (3.00)
 - MIAE 215 Programming for Mechanical and Industrial Engineers (3.50)
 - PHYS 235 Object-Oriented Programming and Applications (3.00)
 - PHYS 236 Numerical Methods in Physics with Python (3.00)
 - SOCI 212 Statistics I (3.00)
2. COEN courses or INTE courses can only be taken with permission. In general, courses offered outside the Department of CSSE that contain substantial programming or computer science content may not be taken. Such courses may qualify as a General Elective only with prior written permission on a GCS Student Request form, obtainable from the Office of Student Academic Services in the Gina Cody School of Engineering and Computer Science.
3. At most, six credits of the following courses may be taken for credit towards the General Electives requirement:
 - FRAN 211 French Language: Elementary (6.00)
 - FRAN 212 French Language: Transitional Level (6.00)
 - FRAN 215 Langue française : niveau intermédiaire II (3.00)
4. ESL courses may not be taken to fulfill the General Electives requirement.

7.1.2. *Description Activities and Evaluation Methods*

- **Coursework:** Twenty-nine (29) courses develop the knowledge required for the BSc in cybersecurity. The courses favour a blended learning format and include, whenever possible, in-class work and discussions solving practical problems, and teamwork (projects & presentations). Experts from the industry may be invited to present specific topics.
- **Laboratories:** Our cybersecurity laboratory component is a critical aspect of our program, providing students with hands-on experience in the field of cybersecurity. Through the use of advanced tools, students will engage in lab simulations and practical projects that simulate real-world cybersecurity challenges. The labs will reinforce key concepts covered in the core courses and will emphasize the practical application of theoretical knowledge. Students will develop essential skills in areas such as network security, cryptography,

digital forensics, ethical hacking, malware analysis, secure software development, and cloud security. This practical experience will be invaluable in preparing students for the dynamic and ever-changing field of cybersecurity. Upon graduation, students will be well-equipped to enter the workforce and contribute to the defense of information systems and networks against cyber threats.

- **Special activities:** During the summer, students can engage in special activities to earn industry certification, gain work experience, or work in research in one of Concordia’s research centres.

7.1.3. Accreditation Activities

The BSc program, after its first class of graduates, aims to become accredited by the Canadian Information Processing Society (CIPS) under the Computer Science Accreditation Council (CSAC). Part of the accreditation process involves the assessment of the Graduate Attributes, which is introduced in Table 7.5 according to CSAC’s *Accreditation Criteria for Computer Science, Software Engineering and Interdisciplinary Programs* (August 2011, version 1, Section 4.1). All the CIPS graduate attributes can be mapped to the CEAB graduate attributes, as shown in Table 7.5.

The courses listed in 7.1.1 have been developed considering both graduate attributes and satisfy the accreditation requirements of both CIPS (for the BSc) and CEAB (BEng) concurrently. Detailed graduate attributes mapping tables can be found in Appendix 3A.

Table 7.5 CIPS Graduate Attributes and Mapping to CEAB Graduate Attributes

CIPS Graduate Attributes	CIPS Definitions	Corresponding CEAB Graduate Attributes and Definitions
1. Demonstrate Knowledge	Competently apply knowledge in a) software engineering, b) algorithms and data structures, c) systems software, d) computer elements and architectures, e) theoretical foundations of computing, f) discrete mathematics and g) probability and statistics.	A knowledge base for engineering: Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.
2. Analyse and Solve Problems	Use appropriate knowledge and skills, including background research and experimentation, to identify, investigate, abstract, conceptualize, analyse, and solve complex computing problems, in order to reach substantiated conclusions.	Problem analysis: An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve complex engineering problems in order to reach substantiated conclusions. Investigation: An ability to conduct investigations of complex problems by methods that include appropriate experiments, analysis and interpretation of data, and synthesis of information in order to reach valid conclusions.
3. Design Software and Systems	Design and evaluate solutions for complex open-ended computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, as well as economic, cultural, societal, and environmental considerations	Design: An ability to design solutions for complex, open-ended engineering problems and to design systems, components or processes that meet specified needs with appropriate attention to health and safety risks, applicable standards, and economic, environmental, cultural and societal considerations.
4. Use Appropriate	Create, select, adapt and apply appropriate	Use of engineering tools: An ability to

Resources	techniques, resources, and modern computing tools to complex computing activities, with an understanding of their strengths and limitations.	create, select, apply, adapt, and extend appropriate techniques, resources, and modern engineering tools to a range of engineering activities, from simple to complex, with an understanding of the associated limitations.
5. Work Individually and in a Team	Function effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings	Individual and team work: An ability to work effectively as a member and leader in teams, preferably in a multi-disciplinary setting.
6. Communicate Effectively	Communicate with the computing community and with society at large about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions	Communication skills: An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.
7. Act Professionally	Act appropriately with respect to ethical, societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and with regard to the consequential responsibilities relevant to professional computing practice.	Professionalism: An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest. Impact of engineering on society and the environment: An ability to analyze social and environmental aspects of engineering activities. Such ability includes an understanding of the interactions that engineering has with the economic, social, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship. Ethics and equity: An ability to apply professional ethics, accountability, and equity.
8. Be Prepared for Life-Long Learning	Learn new tools, computer languages, technologies, techniques, standards and practices, as well as be able to identify and address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge.	Life-long learning: An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge.
9. Demonstrate	Possess knowledge in areas other than computer	Impact of engineering on society and

<p>Breadth of Knowledge</p>	<p>science and mathematics so as to be able to communicate effectively with professionals in those fields.</p>	<p>the environment: An ability to analyze social and environmental aspects of engineering activities. Such ability includes an understanding of the interactions that engineering has with the economic, social, health, safety, legal, and cultural aspects of society, the uncertainties in the prediction of such interactions; and the concepts of sustainable design and development and environmental stewardship.</p> <p>Economics and project management: An ability to appropriately incorporate economics and business practices including project, risk, and change management into the practice of engineering and to understand their limitations.</p> <p>Communication skills: An ability to communicate complex engineering concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and design documentation, and to give and effectively respond to clear instructions.</p>
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Another important part is the assessment of the curriculum content and quality, measured by the number and distribution of courses. Considering the BSc in Cybersecurity as an interdisciplinary program, the required number of courses according to CIPS are as follows:

- A. **Ten (10) courses** in computer science, software engineering or computer engineering.
- B. **Ten (10) courses** from the Other Discipline or disciplines of the interdisciplinary program, with no discipline having fewer than five (5) courses.
- C. **Three (3) courses** in mathematics.
- D. **Three (3) courses** in non-technical disciplines, defined as disciplines other than computer science, natural sciences, mathematics and engineering.

According to CIPS/CSAC, the above requirements of **26 courses** leave each institution with the room of extra courses to satisfy additional program requirements (which may include more CS, more mathematics, and/or more of the Other Disciplines) and to accomplish personal objectives. Considering the presence of CEGEP education that is unique to Quebec, CSAC has also noted that a program from Quebec may also include CEGEP courses for students who have obtained a (general curriculum) pre-university CEGEP diploma or a technical CEGEP diploma (leading to a university program).

As show in Table 7.6, the proposed program with 29 courses will be able to satisfy the CISP/CSAC accreditation requirements. To ensure that there is a balance between the Other Disciplines and computer science, CIPS/CSAC also requires the total number of courses for the Other Disciplines should be similar to the number of computer science courses required, which is also satisfied in the proposed BSc program.

Table 7.6. BSc Program under CIPS/CSAC Accreditation Requirements

Course disciplines	CIPS/CSAC Requirements	BSc Program
Computer science, software engineering or computer engineering	10 courses	30 credits in the Complementary Core Courses
Other Discipline	10 courses	34.5 credits , including 25.5 credits from the Cybersecurity Core Courses and 9 credits from the Cybersecurity Elective Courses
Mathematics	3 courses	9 credits from Mathematics Electives
Non-technical disciplines	3 courses	9 credits from General Electives in UG Calendar Section 71.110
Others	Not specified	6 credits from Mathematics, and/or General Electives
Subtotal	26 courses	90 credits (30 courses)

To date, only one BSc program specialized in Cybersecurity has been accredited by CIPS/CSAC. The program is a 120-credit program currently offered by York University requiring 5 cybersecurity core courses of 16 credits (Applied Cryptography, Introduction to Computer Security, Computer Security Project, Computer Security Laboratory, and Computer Security Management: Assessment and Forensics), compared to 8 cybersecurity core courses of 24 credits required in the proposed BSc.

7.2. Pedagogical approaches

7.2.1. Combined theoretical and practical training

All the courses in the degree program will have in-person lectures discussing the relevant theory. In these lectures, the theoretical principles underlying the core cybersecurity engineering concepts will be discussed in detail. The application of these principles will be demonstrated through problem-solving. Problem-solving skills will be further developed by problem-set assignments.

To bridge the gap between theory and practice, many of the core courses in the degree program will have a project component in which students will apply their theoretical knowledge to solve industrially relevant problems. These projects will be carried out in teams to foster teamwork and collaboration, and to enhance the communication and leadership skills of the students. Students will be responsible for identifying a critical need/problem in the industry or a societal need in applicable courses. They will conduct appropriate experimentation/analysis and draw conclusions using their engineering judgment. Students will present and discuss their findings and participate in evaluating the work of other teams.

7.2.2. Hands-on laboratory training

Hands-on laboratory training is a key component of our undergraduate cybersecurity program, providing students with practical experience in applying theoretical concepts to real-world cybersecurity scenarios. Our laboratory sessions are designed to reinforce key concepts covered in the core courses and will emphasize problem-solving and achieving specific objectives. Students will have access to advanced equipment and tools and will engage in virtual lab simulations to prepare for the physical lab.

Through our laboratory sessions, students will develop essential skills in areas such as network security, cryptography,

digital forensics, ethical hacking, malware analysis, secure software development, and cloud security. We also incorporate emerging technologies and trends into our lab sessions to ensure that our students are up to date with the latest advancements in cybersecurity.

Our hands-on laboratory training is led by not only cybersecurity faculty members but also experienced professionals who bring industry expertise and real-world experience to the classroom. This practical experience will be invaluable in preparing students for the dynamic and ever-changing field of cybersecurity. Upon graduation, students will have the practical skills and knowledge necessary to enter the workforce and contribute to the defense of information systems and networks against cyber threats.

7.2.3. Innovation in Teaching and Learning

Innovation in teaching and learning is crucial for our cybersecurity program, given the rapidly changing landscape of cybersecurity threats and technologies. We are committed to providing our students with cutting-edge education that prepares them to address the latest cybersecurity challenges. To achieve this goal, we have implemented various innovative teaching and learning strategies such as project-based learning, flipped classrooms, and simulations. These strategies are designed to engage students actively, promote critical thinking, and enhance problem-solving skills. Our program also utilizes online resources, open educational resources, and multimedia tools to enhance student learning and accessibility. Additionally, we provide students with opportunities to participate in cybersecurity competitions, hackathons, and internships to apply their skills and knowledge to real-world scenarios. By utilizing innovative teaching and learning strategies, we aim to produce cybersecurity professionals who are well-equipped to address the ever-changing cybersecurity landscape.

7.2.4. Work-Integrated learning

Concordia University offers a variety of structured work-integrated learning programs through the Institute for Cooperative Education. Work-integrated learning is a model of experiential learning that bridges the academic program and the world of work. Among the different modalities offered, the Co-op program is the longest-standing and the most popular. Students admitted to the Co-op program will alternate between study terms and three internships with three different employers. The program integrates academic studies with program-relevant work experiences in a progressive manner, giving students the opportunity to transfer knowledge and skills between work and classroom settings.

Students can apply to Co-op by completing the appropriate section on the University Admission form. Admission to the program is based on academic performance and a few other factors. Students can also apply to Co-op after being enrolled in the program as long as they have a minimum of 60 credits remaining.

Most of the bachelor's programs at Gina Cody School offer Co-op options. Two of those programs (Electrical Engineering and Computer Engineering) also added another modality of work-integrated learning called C-Edge (Career Edge) as a mandatory part of the curriculum. In those programs, all students who are not enrolled in the Co-op program must complete one 12- to 17-week paid internship to graduate. This ensures every student in the program an opportunity for experiential learning in a real-world context.

Capitalizing on other programs' experience in incorporating work-integrated learning in the curriculum, the proposed BSc in Cybersecurity will also open the Co-op and the C-Edge programs to its students. Both programs will be optional upon the launch of the new program, but a clear pathway and ample support will be provided to students enrolled in those programs. There is a possibility of making Co-op mandatory a few years down the road when enrollments are steady and connections with employers are well established.

Other Experiential Learning (EL) Opportunities

Like students enrolled in any other program at Concordia University, students in the proposed new program will benefit from the following experiential learning and professional development offerings provided by the university to expand their hands-on and professional learning opportunities.

Concordia offers six types of experiential learning opportunities: course-integrated, work-integrated, research-based, community-based, international, and student life. Students can search for EL opportunities to participate in by faculty, program, or by type. Career counselors are available to help students explore how different experiential learning opportunities complement different career pathways or their particular career goals. In addition, a personal EL roadmap tool is available to all students, which helps students plan to integrate experiential learning activities into their studies throughout the program.

Concordia has also partnered with Riipen, the world's leading virtual project-based learning platform that connects students with industry and community partners to complete real-world projects for academic credit. Faculty can use Riipen to find real-world projects to use as course assignments and track student progress in real time.

Free professional development courses

Concordia provides students as well as faculty and staff access to more than 4000 free online courses from UdeMy covering virtually all disciplines. BSc in Cybersecurity students can find courses that help them solidify prerequisite knowledge, enhance their current studies within the curriculum, and build professional skills as cybersecurity professionals.

7.3. Typical student path and course sequences

The proposed degree is a full-time, 3-year program with an optional co-op stream. Table 7.7 below shows a sample program pathway for students enrolled in the co-op program with a September entry.

Table 7.7. Study/Work Sequence for the Co-op Program (September Entry)

Year	Fall	Winter	Summer
1	Study	Study	Work 1
2	Study	Work 2	Study
3	Work 3	Study	Study

The core courses in cybersecurity engineering will be offered in all three semesters (Fall, Winter, Summer) to accommodate the needs of students in both the regular and the co-op programs. For a detailed mapping of all courses to academic semesters for regular and co-op and students, see the pathways provided in the following pages for September Entry – Regular and Co-op.

Table 7.8. Typical Course Sequence (September Entry – Regular)

Typical Course Sequence (September Entry – Regular)

Year 1		Year 2		Year 3	
Fall	Winter	Fall	Winter	Fall	Winter
INSE 201 Security Ethics, Laws, Standards & Compliance (1.5)	INSE 221 Cryptography I (3) pre: COMP 232 or COEN 231	INSE 321 Cryptography II (3) pre: INSE 221	INSE 349 Secure Programming and Software Design (3) pre: INSE 221	INSE 331 Database Security (3) pre: INSE 349; COMP 352 or COEN 352	INSE 445 Network Security (3) pre: INSE 321, 349; COMP 445 or ELEC/COEN 366
COMP 232 Mathematics for Computer Science (3) pre: MATH 203, 204	General Elective Course 2 (3)	Cybersecurity Elective Course 1 (3)	COMP 346 Operating Systems (4) pre: COMP/SOEN 228; COMP 352	COMP 445 Data Communication and Computer Networks (4) pre: COMP 346	INSE 413 Security Auditing and Compliance (3) pre: INSE 331, 351 co-req: INSE 445
COMP 248 Object-Oriented Programming I (3.5) pre: MATH 204	COMP 249 Object-Oriented Programming II (3.5) pre: COMP 248; MATH 203, 205	COMP 348 Principles of Programming Languages (3) pre: COMP 249	Cybersecurity Elective Course 2(3)	INSE 351 Operating System Security (3) pre: INSE 349; COMP/COEN 346	General Elective Course 5 (3)
General Elective Course 1 (3)	ENCS 282 Technical Writing and Communication (3) pre: EWT/ENCS 272	COMP 352 Data Structures and Algorithms (3) pre: COMP 232, 249	General Elective Course 3 (3)	Math Elective Course 3 (3)	General Elective Course 6 (1.5)
Math Elective Course 1 (3)	COMP 228 System Hardware (3) pre: COMP 248; MATH 203, 204	Math Elective Course 2 (3)	Cybersecurity Elective Course 3 (3)	General Elective Course 4 (3)	General Elective Course 7 (3)
Fall: 14 credits	Winter: 15.5 credits	Fall: 15 credits	Summer: 16 credits	Winter: 16 credits	Summer: 13.5 credits
Year 1: 29.5 credits		Year 2: 31 credits		Year 3: 29.5 credits	

Table 7.9. Typical Course Sequence (September Entry - Co-op)

Typical Course Sequence (September Entry – Co-op)

Year 1			Year 2			Year 3		
Fall	Winter	Summer	Fall	Winter	Summer	Fall	Winter	Summer
INSE 201 Security Ethics, Laws, Standards & Compliance (1.5)	INSE 221 Cryptography I (3) pre: COMP 232 or COEN 231	Work Term 1	INSE 321 Cryptography II (3) pre: INSE 221	Work Term 2	INSE 349 Secure Programming and Software Design (3) pre: INSE 221	Work Term 3	INSE 331 Database Security (3) pre: INSE 349; COMP 352 or COEN 352	INSE 445 Network Security (3) pre: INSE 321, 349; COMP 445 or ELEC/COEN 366
COMP 232 Mathematics for Computer Science (3) pre: MATH 203, 204	General Elective Course 2 (3)		Cybersecurity Elective Course 1 (3)		COMP 346 Operating Systems (4) pre: COMP/SOEN 228; COMP 352		COMP 445 Data Communication and Computer Networks (4) pre: COMP 346	INSE 413 Security Auditing and Compliance (3) pre: INSE 331, 341, 351
COMP 248 Object-Oriented Programming I (3.5) pre: MATH 204	COMP 249 Object-Oriented Programming II (3.5) pre: COMP 248; MATH 203, 205		COMP 348 Principles of Programming Languages (3) pre: COMP 249		Cybersecurity Elective Course 2 (3)		INSE 351 Operating System Security (3) pre: INSE 349; COMP/COEN 346	General Elective Course 5 (3)
General Elective Course 1 (3)	ENCS 282 Technical Writing and Communication (3) pre: EWT/ENCS 272		COMP 352 Data Structures and Algorithms (3) pre: COMP 232, 249		General Elective Course 3 (3)		Math Elective Course 3 (3)	General Elective Course 6 (1.5)
Math Elective Course 1 (3)	COMP 228 System Hardware (3) pre: COMP 248; MATH 203, 204		Math Elective Course 2 (3)		Cybersecurity Elective Course 3 (3)		General Elective Course 4 (3)	General Elective Course 7 (3)
Fall: 14 credits	Winter: 15.5 credits		Fall: 15 credits		Summer: 16 credits		Winter: 16 credits	Summer: 13.5 credits
Year 1: 29.5 credits			Year 2: 31 credits				Year 3: 29.5 credits	

<p style="text-align: center;">Total program credits: 90</p> <p style="text-align: center;">Total number of courses: 30</p>				
Cybersecurity Core Course	Complementary Core Course	Cybersecurity Elective Course	Mathematics Elective Course	General Education Elective Course
22.5 credits 9 courses	30 credits 9 courses	9 credits 3 courses	9 credits 3 courses	19.5 credits 6 courses
Pre = Prerequisite course Co = Corequisite course	<p>Prerequisites and corequisites: A prerequisite is a specific course students need to take before another course.</p> <p>A co-requisite is when a specific course must be taken in the same academic term as another course unless students have already successfully completed it.</p>			

Table 7.10. Course sequence and full load offering for all entries.

COURSE	TITLE	CREDIT	PRE-REQ	CO-REQ	SUM 1	SUM 2	FALL	WIN
COMP 228	System Hardware	3.0	COMP 248; MATH 203, 204				X	X
COMP 232	Mathematics for Computer Science	3.0	MATH 203, 204				X	X
COMP 248	Object-Oriented Programming I	3.5	MATH 204				X	X
COMP 249	Object-Oriented Programming II	3.5	COMP 248; MATH 203, 205				X	X
COMP 346	Operating Systems	4.0	COMP/SOEN 228; COMP 352		X		X	X
COMP 348	Principles of Programming Languages	3.0	COMP 249		X		X	X
COMP 352	Data Structures and Algorithms	3.0	COMP 232, 249		X		X	X
COMP 445	Data Communications & Computer Networks	4.0	COMP 346		X		X	X
ENCS 282	Technical Writing and Communication	3.0	EWT/ENCS 272		X	X	X	X
ENGR 213	Applied Ordinary Differential Equations	3.0	MATH 205	MATH 204	X		X	X
ENGR 233	Applied Advanced Calculus	3.0	MATH 204, 205		X	X	X	X
ENGR 371	Probability and Statistics in Engineering	3.0	ENGR 213, 233		X	X	X	X
ENGR 391	Numerical Methods in Engineering	3.0	ENGR 213, 233; COMP 248/COEN 243			X	X	X
INSE 201	Security Ethics, Laws, Standards & Compliance	1.5			X		X	X
INSE 221	Cryptography I	3.0	COMP 232/COEN 231		X		X	X
INSE 321	Cryptography II	3.0	INSE 221				X	X
INSE 331	Database Security	3.0	INSE 349; COMP 352/COEN 352				X	X
INSE 349	Secure Programming and Software Design	3.0	INSE 221				X	X
INSE 351	Operating System security	3.0	INSE 349; COMP/COEN 346				X	X
INSE 390	Cybersecurity Engineering Team Design Project	3.0	ENCS 282, ENGR 371 INSE 331, 351	INSE 445			X	X
INSE 401	Usability and Human Aspects of Security	3.0	INSE 321				X	X
INSE 411	Privacy: Enhancing Technologies, Analysis and Measurement	3.0	INSE 401				X	X
INSE 412	Cybercrime & Digital Forensics	3.0	INSE 401, 442				X	X
INSE 413	Security Auditing and Compliance	3.0	INSE 331, 351	INSE 445			X	X
INSE 441	Mobile Application Security and Privacy	3.0	INSE 349, 445				X	X
INSE 442	Reverse Engineering, Application and Malware Analysis	3.0	INSE 331, 351				X	X
INSE 445	Network Security	3.0	INSE 321, 349; COMP 445 or ELEC/COEN 366				X	X
INSE 452	Penetration Testing and Ethical Hacking	3.0	INSE 442, 445				X	X
INSE 481	Blockchain Technologies & Applications	3.0						X
INSE 482	Industrial Control Systems & Critical Infrastructure Security	3.0						X
INSE 483	IoT and Embedded System Security	3.0						X
INSE 484	Quantum Computing & Security	3.0						X
INSE 485	Cybersecurity of Healthcare Systems and Devices	3.0						X
INSE 486	Cybersecurity Management & Governance	3.0						X
INSE 490	Capstone Cybersecurity Engineering Design Project	6.0	INSE 390, ENGR 301, ENGR 391				X	X
INSE 498	Topics in Cybersecurity Engineering	3.0						X

7.4. Feedback and evaluation

A description of the feedback and evaluation of the co-operative education program is given in Section 7.4.1. There is no research component of the program.

7.4.1. Feedback and Evaluation Processes for the Co-operative Format

The Institute for Co-operative Education offers a number of work-integrated learning opportunities to students in the GCS. Work-integrated learning is a model of experiential learning that bridges the academic program and the world of work. It provides students with the opportunity to combine study with paid work terms in their chosen fields.

The academic content is identical to that of the regular programs with three work terms interspersed with study terms. However, in order to continue their studies in the co-operative format in the GCS, or to graduate from one of its programs as members of the Institute for Co-operative Education, students must satisfy the following conditions:

- i. must be in acceptable standing and maintain a cumulative grade point average (CGPA) of at least 2.50 in their program (the CGPA is calculated in the manner described in Section 16.3.10 Academic Performance under [Section 16.3 Evaluation, Administrative Notations, Examinations, and Performance Requirements](#));
- ii. be assigned a grade of pass for each of the three work-term courses (CWTE or CWTC). Under certain conditions, students may be placed on co-op probation status;
- iii. remain in their designated work study sequence. Any deviations must have prior approval by the director of the Institute for Co-operative Education in consultation with the co-op program director in their department.

Regulations for Work Terms

- Successful completion of the work terms shown in the Co-op Schedule indicated in [Section 24 Institute for Co-operative Education](#) is a prerequisite for graduation as a member of the Institute for Co-operative Education.
- Work-term job descriptions are screened by the co-op coordinator. Only jobs approved by the Institute for Co-operative Education will be accepted as being suitable for the work-term requirements.
- Work-term jobs are full-time employment normally for a minimum of 12 consecutive weeks (14 to 16 weeks, preferably).
- A work-term report must be submitted each work term on a subject related to the student's employment. This report must be submitted to the Institute for Co-operative Education on or before the deadline shown in [Section 24 Institute for Co-operative Education](#). Grammar and content of work-term reports are evaluated by the Institute for Co-operative Education and the technical aspects are evaluated by the co-op program director responsible. Evidence of the student's ability to gather material relating to the job, analyze it effectively, and present it in a clear, logical, and concise form is required in the report.
- The required communication component consists of an oral presentation on a technical subject or engineering task taken from the student's work environment. The presentation will be given on campus in a formal setting after students have returned to their study term. A written summary is also required. Guidelines for the preparation of this oral presentation are provided in the Co-op Student Handbook.
- Work terms will be evaluated for satisfactory completion. Assessment is based upon the employer evaluation of performance, the work-term report, graded by the Academic Director, and communication component which together constitute the job performance as related to the whole work term. Students must pass all required components. The grade of pass or fail will be assigned to each of the work-term courses. A failing grade will result in the student's withdrawal from the Institute for Co-operative Education.

Student Demand and Enrolment

All students will be able to apply for the Co-op program. Those who are not admitted to the Co-op program can enroll in the Career Edge program. Every student who wishes to have an internship will have the opportunity to enroll in the Career Edge program.

8. SUPPORT FOR STUDENT SUCCESS

8.1. Financial support

There are various sources of funding available to support the students. Below is a list of applicable financial support programs to the BSc in Cybersecurity students.

University-wide sources of funding:

- Concordia Council on Student Life Special Project Funding
- Concordia University Small Grants Program
- Concordia University Alumni Association (CUAA)
- Concordia Student Union (CSU)
- Grants for Religious and Spiritual Groups
- QPIRG Discretionary Fund
- Sustainability Action Fund
- SHIFT Centre for Social Transformation
- Concordia University Undergraduate Entrance Bursary Program
- Concordia University Undergraduate In-Course Bursary program
- Brian T. Counihan Scholarship for Outstanding Contribution to Student Life
- Colors of Concordia Award
- Dr. Dimitri Elia Bitar Scholarships
- Garnet Key Entrance Award
- Lambda Scholarship Tuition Award
- Leadership in Environmental Sustainability Shuffle Award
- Leonard J. Bocarro Science, Engineering and Technology Scholarship
- Loyola Foundation Inc. Entrance Scholarship
- NSERC USRA Competition
- Pierre-Peladeau Bourses
- Queen of Angels Academy Foundation Memorial Award
- Susan Levin Woods Scholarship
- Concordia Presidential Scholarship
- Concordia International Scholars
- Student Mobility Program
- Concordia Undergraduate Student Research Awards Program
- External Awards

Gina Cody School of Engineering and Computer Science (GCS) sources of funding:

For all students:

- Fariborz and Roya Haghighat Entrance Scholarship in Engineering (\$5,000 value)
- Gina Cody Undergraduate Entrance Scholarship in Engineering and Computer Science (\$5,000 value)
- Marie and Bob Baird Entrance Scholarship (\$5,000 value)
- Petrogiannis Family Award for Women in Engineering (\$5,000 value)
- Concordia University Shuffle Entrance Scholarship (\$3,000 value)
- Bachelor of Engineering 50th Anniversary Scholarship (\$2,500 value)
- Concordia University Entrance Scholarship (\$2,500 value)
- Concordia University Adopt-A-Student Entrance Scholarship
- Gina Cody School Shuffle Scholarship (\$1,661.66 value)
- Carolina Gallo Scholarship for Women in Engineering and Computer Science (\$1,000 value)

- ENCS Student Life Award (\$1,000 value)

For International students:

- Concordia University International Tuition Entrance Scholarship (\$5,000 value)

For Canadian citizens and permanent residents:

- Normand D. Hébert Scholarship in Engineering (\$7,000 value)
- NDT Technologies Inc. Scholarship for Engineering and Computer Science (\$5,000 value)
- Robert Walsh Entrance Scholarship in Engineering and Computer Science (\$5,000 value)
- Gina Cody School Women in Engineering Entrance Scholarships (\$2,500 value)
- Concordia University Alumni Association Entrance Scholarship (\$2,000 value)
- Jack Bordan Entrance Scholarship in Engineering and Computer Science (\$2,000 value)
- Concordia University Memorial Endowment Entrance Scholarship (\$1,250 value)
- Schouela Family Entrance Scholarship (\$1,250 value)

For Canadian citizens with Quebec resident status

- Distinguished CEGEP Entrance Scholarship in Engineering and Computer Science (\$5,000 value)

For Quebec students

- Gina Cody School Undergraduate Entrance Scholarship (\$3,000 value)

8.2. Student Services

There are a variety of student services, workshops, and events offered by various offices in Concordia, the Concordia Institute for Information Systems Engineering, and various Student Associations. Below is a non-exhaustive list of these services:

- Admission advising
- Immigration advising
- Academic advising & support
- Financial support
- Health & well-being
- Career & job resources
- Student life
- Student Emergency and Food Fund
- CIISE Undergraduate Orientation Session
- CIISE Gala Event
- CIISE Undergraduate Research Day
- CIISE Undergraduate Student Handbook
- CIISE Workshops
- CIISE Annual BBQ Event
- CIISE Seminar Series
- Student Association Events
- Capstone Poster Day

Related Offices:

- Student Academic Services (SAS)
- International Students Office (ISO)
- Student Success Centre
- Financial Aid and Awards Office
- Health Services
- Campus Security
- Access Centre for Students with Disabilities (ACSD)
- Multi-Faith and Spirituality Centre
- Career and Planning Services (CAPS)

- Otsenhákta Student Centre
- Concordia University Student Parents Centre (CUSP)
- Dean of Students
- LIVE Centre
- IT support (AITS)
- ASFA Student Life Volunteer Pool

Student Associations:

- ECSGA (Engineering and Computer Science Graduate Association)
- ECA (Engineering and Computer Science Association)
- Concordia Student Union
- WIE (Women in Engineering)
- GCES (Gina Cody School Entrepreneurship Society)
- EngGames (Engineering Games – Concordia University)
- Hack Concordia
- Space Concordia

8.3. Academic and student life

There are various opportunities for students to be involved in the community and in associations within the university.

- **Multi-faith and Spirituality Centre**
A home on campus for all those who wish to celebrate the human spirit, open to all students whether spiritual, secular or religious.
- **Centre for Gender Advocacy**
An independent, student-funded organization mandated to promote gender equality and empowerment particularly as it relates to marginalized communities.
- **Centre for Creative Reuse**
CUCCR is dedicated to diverting materials from inside Concordia’s waste-stream and offering them to the general community free of cost.
- **D3 Center for Innovation and Entrepreneurship**
Center for Innovation and Entrepreneurship that provides the necessary tools, resources and knowledge to move from idea to impact with confidence.
- **The SHIFT Centre for Social Transformation**
Supports existing and emerging social transformation initiatives that unite with the goal of creating a more just, inclusive and broadly prosperous Montreal.
- **Sustainability Hub**
Promoting sustainability-related initiatives, tools, resources, research, funds and programs to the Concordia community.
- **Spark!**
Inspiration for students to actively participate in learning experiences at Concordia that have a positive impact on their success.
- **Otsenhákta Student Centre**
An on-campus resource for First Nations, Métis and Inuit students to find community, plan social events and access resources to help them achieve academic success.
- **University of the Streets Café**
A program that organizes bilingual public conversations in cafés and community spaces across Montreal.
- **Zero Waste**

An initiative focused on reducing waste on campus and encouraging the Concordia community to reduce, reuse, recycle and rot.

- **Black Perspectives Office**
Connects and supports activities related to Black perspectives, initiatives and scholarship on campus and within the broader Montreal community.
- **Quebec Public Interest Research Group**
An inclusive resource centre that supports grassroots activism around diverse social and environmental issues and aims to inspire social change.
- **Office of Community Engagement**
Connecting faculty, staff and students with members of the wider Montreal community in order to build meaningful relationships.
- **Queer Concordia**
An on-campus resource centre for queer, lesbian, gay, trans, two-spirited, bisexual, asexual, intersex, questioning and allies.
- **Best Buddies**
In collaboration with Best Buddies Canada to create fun, meaningful and lasting friendships.
- **Homeroom**
A virtual place for new undergraduate students to connect and navigate the university experience together.
- **Student Association Events**
Once the BSc program is formed, a student association for the Cybersecurity bachelor's program will be started, consisting of academic representatives and social representatives for each year of the program. Academic representatives will be responsible for collecting student feedback from courses and giving it to the Undergraduate Program Director. Social representatives will be responsible for organizing social events for students, including student, staff, and faculty mixers every semester and fundraising events.

9. RESOURCES

9.1. Faculty Resources

9.1.1. Current Faculty

Full-Time Faculty Members:

Director, Dr. Chun Wang, Professor (CW)
Associate Director, Dr. Yong Zeng, Professor (YZ)
GPD (course-based), Dr. Ayda Basyouni, Senior Lecturer (AB)
GPD (thesis-based), Dr. Jun Yan, Associate Professor (JY)
Dr. Abdessamad Ben Hamza, Professor (ABH)
Dr. Ali Ayub, Assistant Professor (AiA) (To start in May 2024)
Dr. Amin Hammad, Professor (AmH)
Dr. Amr Youssef, Professor (AY)
Dr. Andrea Schiffauerova, Professor (AS)
Dr. Anjali Awasthi, Professor (AnA)
Dr. Arash Mohammadi, Associate Professor (AM)
Dr. Carol Fung, Associate Professor (CF)
Dr. Chadi Assi, Professor (CA)
Dr. Farnoosh Naderkhani, Associate Professor (FN)
Dr. Ivan Pustogarov, Assistant Professor (IP)
Dr. Jamal Bentahar, Professor (JB)
Dr. Jeremy Clark, Associate Professor (JC)
Dr. Lingyu Wang, Professor (LW)
Dr. Manar Amayri, Assistant Professor (MA)
Dr. Mohammad Mannan, Associate Professor (MM)
Dr. Mohsen Ghafouri, Assistant Professor (MG)
Dr. Mourad Debbabi, Professor (MD)
Dr. Nizar Bouguila, Professor (NB)
Dr. Rachida Dssouli, Professor (RD)
Dr. Roch Glitho, Professor (RG)
Dr. Suryadipta Majumdar, Associate Professor (SuM)
Dr. Walter Lucia, Associate Professor (WL)
Dr. Zachary Patterson, Professor (ZP)

Associate Members:

Aiman Hanna, Affiliate Assistant Professor/Senior Lecturer (AiH)
Makan Pourzandi, Affiliate Associate Professor/Research Leader at Ericsson (MP)
Serguei Mokhov, Affiliate Assistant Professor/AITS Network and Security Manager (SeM)

Please see Appendix 8 for the CVs of current faculty members. A table demonstrating the ability of the faculty to teach the planned INSE courses in this program is given below in Table 9.1.

Table 9.1. Faculty Teaching Capabilities

	Course Codes	Course Titles	Professor Initials	# of Profs
Core Courses	COMP 232	Mathematics for Computer Science	(All full time and associate members)	31
	COMP 248	Object-Oriented Programming I	(All full time and associate members)	31
	COMP 249	Object-Oriented Programming II	(All full time and associate members)	31
	COEN 366	Communication Networks and Protocols	AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	16
	COMP/SOEN 228	System Hardware	AB, ABH, AiH, AIA, AM, AY, CA, CF, CW, FN, IP, JB, JC, JY, LW, MA, MD, MG, MM, MP, NB, RD, RG, SeM, SuM, WL, YZ, ZP	28
	COMP/COEN 346	Operating Systems	AB, AiH, AIA, AM, AY, CA, CF, IP, JB, JC, JY, LW, MA, MD, MM, MP, NB, RD, RG, SeM, SuM, YZ	22
	COMP 348	Principles of Programming Languages	(All full time and associate members)	31
	COMP 352	Data Structures and Algorithms	AB, ABH, AiH, AIA, AM, AY, CA, CF, CW, FN, IP, JB, JC, JY, MA, MD, MM, MP, NB, RD, RG, SeM, SuM, WL	24
	INSE 211	Introduction to Cybersecurity Engineering	AB, AiH, AIA, AM, AY, CA, CF, FN, IP, JC, JY, LW, MD, MG, MM, MP, RD, RG, SeM, SuM, WL	21
	INSE 221	Cryptography I	AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	16
	INSE 321	Cryptography II	AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	16
	INSE 331	Database Security	AB, ABH, AiH, AIA, AM, AY, CA, CF, IP, JB, JC, JY, MA, MD, MM, MP, RD, RG, SeM, SuM	20
	INSE 349	Secure Programming and Software Design	AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	16
	INSE 351	Operating System Security	AB, AiH, AIA, AM, AY, CA, CF, IP, JB, JC, JY, LW, MD, MM, MP, RD, RG, SuM, YZ	19
	INSE 390	Cybersecurity Engineering Team Design Project	(All full time and associate members)	31
	INSE 401	Usability and Human Aspects of Security	(All full time and associate members)	31
INSE 411	Privacy: Enhancing Technologies, Analysis and Measurement	AB, AY, JC, MM, SeM, SuM	6	

	INSE 412	Cybercrime & Digital Forensics	AB, AY, CA, CF, IP, JC, JY, LW, MM, MP, RD, SeM, SuM	13
	INSE 413	Security Auditing and Compliance	AB, AY, JC, LW, MD, RD, SeM, SuM	8
	INSE 441	Mobile Application Security and Privacy	AB, AiH, AIA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	18
	INSE 442	Reverse Engineering, Application and Malware Analysis	AB, AiH, AIA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	18
	INSE 445	Network Security	AB, AiH, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	16
	INSE 452	Penetration Testing and Ethical Hacking	AB, AiH, AIA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM, YZ	19
	INSE 490	Capstone Cybersecurity Engineering Design Project	(All full time and associate members)	31
	INSE 498	Topics in Cybersecurity Engineering	AB, AiH, AIA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MM, MP, RD, RG, SeM, SuM	18
Technical Electives	INSE 481	Blockchain Technologies & Applications	AB, AY, IP, JC, MM, SeM	6
	INSE 482	Industrial Control Systems & Critical Infrastructure Security	AY, CA, CF, JY, MD, MG, WL, ZP	8
	INSE 483	IoT and Embedded System Security	AB, AIA, AM, AY, CA, CF, IP, JC, JY, LW, MD, MG, MM, MP, RD, RG, SeM, SuM, WL	19
	INSE 484	Quantum Computing & Security	AY, IP, JC, MM, MP	5
	INSE 485	Cybersecurity of Healthcare Systems and Devices	AM, CF, MA, MP, RG, SuM, YZ	7
	INSE 486	Cybersecurity Management & Governance	AB, AY, CF, JC, MD, MP, RD, SeM, SuM, YZ	10

9.1.2. Faculty Hiring Plan

In Year 0, we will need to select an Undergraduate Program Director with a remission of 1.5 credits to handle the launch of the program. This Undergraduate Program Director will be shared with the BEng. Cybersecurity Program. In year 1, this course remission will increase to 3.0 credits per year for handling the operations and curriculum management tasks. In year 1, the Associate Director will be assigned the task of interfacing with the Institute for Co-operative Education for the students who are enrolled in the various internship options (Co-op program, C-Edge, ACE), also receiving a course remission of 1.5 credits per year (The same Associate Director also receive additional 1.5 credits per year for coordinating Graduate co-op programs).

Currently, CISE has 12 faculty members with expertise in cybersecurity and closely related areas to support the proposed programs. This year (2024) we have been also allocated one tenure track position on quantum computing. In addition, as shown in Table 9.1 some of the faculty members in Quality Systems Engineering group can also teach fundamental math and computer science courses in the proposed curriculum. The courses in the BSc program are shared with those in BEng. Students from both programs can sit in the same classroom. In this case, we don't require any additional tenure-track faculty positions for this BSc. Program. In year 1, one ETA is to be made available at the commencement of full program operations. From Year 2 to Year 3, we require an additional ETA to accommodate the

increased course load in each of the two years. Note that BSc students will share the same courses with BEng students. During Year 1 and Year 2 of operation, CIISE TT faculty members can cover the needed INSE courses. After Year 3, newly hired ETAs can cover the increased course load demanded by student program paths.

9.1.3. Support Measures for Teaching

The Centre for Teaching and Learning (CTL) at Concordia University provides new and existing faculty members with a wide range of pedagogical and professional development support, from course design, lesson planning, teaching and assessment strategies, instructional technologies, online or blending learning, inclusive teaching practice, student engagement to course evaluations and the teaching dossier. The support is offered in various formats, from web resources, e-learning modules, and one-on-one teaching consultation, to various programming offerings and events such as workshops, webinars, New Faculty Orientation, Winterfest (teaching and learning festivals), and special projects.

CTL web resources

The CTL website houses an abundance of teaching and learning resources created or curated by the CTL staff³⁷. The content is constantly updated to reflect the current needs of instructors teaching at Concordia as well as to keep abreast of recent trends in faculty development in higher education. New faculty will find the website especially helpful in quickly identifying different kinds of teaching support available to them.

Teaching Academy eLearning modules

The Teaching Academy eLearning modules developed by the CTL in collaboration with eConcordia are dedicated to promoting teaching excellence and continuous professional development for faculty³⁸. The topics are divided into modules and further segmented into micro-modules. The content in each module and micro-module both stands alone and clearly links to related topics, allowing instructors to quickly learn some strategies to meet a particular need as well as follow a learning path to systematically improve certain facets or areas in their teaching practice, such as assessment in general. Like the CTL website, Teaching Academy is also public-facing and freely available to instructors.

New Faculty Orientation

Faculty new hires are invited to participate in the annual CTL New Faculty Orientation that usually takes place in August. The event introduces new faculty members to various pedagogical support and services available to them and helps them kick-start their teaching career at Concordia by encouraging them to think about what teaching means and what it takes to be an effective teacher.

Workshop and webinars

Faculty members are advised to check the *Event* section of the CTL website regularly, especially before the start of a new term. The CTL offers workshops and webinars throughout an academic term, esp. in August, September, December, and January. The Fall and Winter semester workshop and webinar information and registration links are usually sent to departments as well, which will, in turn, be shared with all instructors³⁹.

Teaching consultation

New faculty members are encouraged to book consultations with Teaching Consultants at the CTL, who can meet with instructors to provide advice, support, and resources on a wide variety of teaching-related topics. Here are some of the most common consultation topics:

1. Reviewing a course syllabus
2. Decolonizing & indigenizing the classroom/curriculum
3. Selecting and implementing the appropriate pedagogical approach, teaching strategies, and techniques, such

³⁷ <https://www.concordia.ca/ctl.html>

³⁸ <https://teachingacademy.concordia.ca/>

³⁹ <https://www.concordia.ca/ctl/events/workshops.html>

as: active learning, flipped classroom, group work, class discussions, etc.

4. Classroom management issues
5. Designing assignments and other assessments
6. Grading
7. Selecting the most appropriate technologies
8. Implementing inclusive teaching strategies
9. Lesson planning
10. Preparing a teaching dossier (refer to the [Teaching Dossier](#) pages on Carrefour for more information on preparing a teaching dossier⁴⁰.)
11. Interpreting course evaluations (refer to the [Course evaluations](#) pages on Carrefour for more information on accessing and interpreting your course evaluations⁴¹.)

Teaching observation and feedback

Classroom Observations can be requested by instructors at any stage in their career who are interested in getting feedback on their teaching. The Teaching Consultant regularly observes classes to provide feedback on pedagogy, classroom management, etc.

Once an instructor requests an observation, the Teaching Consultant will be in touch to set up a Pre-Observation meeting to discuss background information and the instructor's specific motivation for the observation. The Teaching Consultant will observe a lecture at a pre-determined time. After the lesson, the instructor completes a reflection, and the Teaching Consultant prepares a confidential report on the lesson. Within one week of the observed lesson, the Teaching Consultant and instructor meet to discuss the lesson and review the report with observations, comments, and suggestions before it is finalized.

Course (Re)Design

If an instructor would like support in developing a new course or revamping an existing course, the CTL can work with individual or a team of instructors to ensure the development of the course follows an evidence-based approach to course design. The CTL can provide support materials and expertise on every aspect of the design of courses as they work together with instructors through each step.

Mid-course feedback

Mid-course feedback can provide valuable information for making changes in teaching before summative evaluation of a course. A teaching consultant is available to aid with interpretation of responses and offer suggestions for improving teaching effectiveness.

9.2. Administrative and support staff

9.2.1. Current Administrative, Technical and Support Staff

Department Administrator, Kimberley Adams
Assistant to the Director: Lilia Pernatozzi
Graduate Programs Coordinator, Silvie Pasquarelli
Graduate Programs Coordinator, Mireille Wahba
Office Assistant, Laura Oproiu

⁴⁰ <https://hub.concordia.ca/carrefour/services/faculty/teaching/teaching-dossier.html>

⁴¹ <https://hub.concordia.ca/carrefour/services/faculty/teaching/course-evaluations.html>

9.2.2. Future Administrative, Technical and Support Staff

At the launch of the BSc program, the Undergraduate Program Assistant will be shared with the BEng program to support program operations including, for example, working with the Undergraduate Program Director in managing the program, taking on the role of answering program related queries from potential and current students, as well as supporting faculty members. We also request one technical staff member (Engineer in Residence) to support the undergraduate labs and Capstone projects. The hiring plan for staff is presented below in Table 9.2.

Table 9.2. Staff Members Hiring Plan

AY	# BEng Students*	Requested Admin	Requested Tech
2024-25	0		-
2025-26	50	Programs Assistant	Lab support technician (shared with BEng. program)
2026-27	120	-	
2027-28	208	-	-
2028-29	287	-	-
2029-30	325	-	-

*Cohort to grow to 100 in steady state. 10% attrition rate applied. Total enrolments in any given academic year, once a full cohort in all years is achieved, is expected to hover around 325.

9.3. Material, technological and library resources

9.3.1. Library Space and Holdings

The Concordia University Library Report is found in Appendix 6. It concludes that the collections and resources relevant to Cybersecurity are adequate to support a BSc in Cybersecurity.

9.3.2. Classroom space

Classroom space for new cybersecurity courses (lectures and tutorials) will be available at the SGW campus for the appropriate enrollments as the course grows and will be assigned through the University.

9.3.3. Laboratory space and equipment

Concordia University has invested close to half a million dollars to create a Security Research Centre that has enough space to accommodate over 30 security researchers, lab facilities, and a dedicated server room. The facility, located on the 9th floor of the Engineering and Visual Arts (EV) building, has been enhanced by over two million dollars in external research equipment grants, which supports security research activities in CIISE and Gina Cody School.

Two dedicated teaching labs are located on the 9th floor of the Hall building and are used by CIISE students enrolled in several information systems security courses for hands-on laboratories. It is anticipated that the programs can be established with relatively minor capital injections through regular capital project competitions at Concordia University. This assumes an annual intake of about 100 new students in BEng in Cybersecurity Engineering program and 100 new students in BSc in Cybersecurity program so that, with attrition, the total number of students in both programs will be around 600. If the intake significantly exceeds 100 students per year in each program, additional lab space and larger classrooms will be needed.

The department will work with multiple industrial partners specialized in cybersecurity training, such as Cisco, Hydro-Québec, and Schweitzer Engineering Laboratories (SEL), to develop unique lab components. For example:

- Cisco has donated multiple equipment to the department and was the sponsor of Concordia’s Computer Security Laboratory, the predecessor to the Security Research Center. The company itself is a world leader in networking and security solutions, which also offers extensive training and certification with over 17 million past and 1.2 million current trainees worldwide. The department plans to leverage the partnership to co-design

experiential learning resources for networking and security courses (e.g., INSE 441, 445, and 452) that can significantly enhance the hands-on learning experience for the students. In addition, Cisco can also participate in the design of lab components and simulation environments in these courses to integrate practical real-world scenarios into the corresponding course modules.

- Hydro-Québec is only provincial electric utility in Quebec who has partnered with CIISE faculty members on cybersecurity of power grids since 2014 and has jointly funded the NSERC Senior Industrial Research Chair on Smart Grid Security held by Dr. Mourad Debbabi since 2016. Many graduate students of the department have been participating in collaborative research and on-site internships at the Hydro-Québec Research Institute (IREQ) for smart grid security, substation security, and many other projects.

The department plans to further extend this partnership to develop new course modules (e.g., INSE 482, 486, 498), site visits, co-op programs, team design and capstone projects (INSE 390 and 490), and other opportunities that can enrich the proposed undergraduate program. As Hydro-Québec is a major stakeholder and employer in Quebec's cybersecurity ecosystem, the partnership can benefit various courses and

- SEL is one of the largest industrial control system providers for power and energy systems in North America and have offered online courses, on-site workshops, and course embeddings across universities in the United States. The department has been discussing with SEL on the possibility to design and/or delivery lab components that can be embedded into regular courses on industrial control system cybersecurity (e.g., INSE 482 and 498). These lab components can leverage SEL devices that have been (or are being) acquired by the department, which are valued at over CAD \$500,000; they can also leverage flexible solutions offered by SEL, which are mounted on portable racks that can be conveniently networked with existing CIISE labs in the Hall Building. The department has multiple faculty members (Drs. Jun Yan, Mohsen Ghafouri, and Walter Lucia) who can integrate and deliver these lab components; in addition, SEL can also provide industrial experts to help design and deliver the components, who have extensive experience in cybersecurity for critical infrastructures.

In addition to the partners and corresponding lab component potentials above, more lab components will also be co-developed with other industrial and government partners to enrich experiential learning for the proposed program once it is launched.

All these components will be designed as virtual labs accessible from the existing CIISE teaching facilities, requiring no additional lab space physically. They will be either built as portable platforms that can be handily installed/uninstalled in the Hall building teaching labs, or as (co-)simulated modules hosted on existing CIISE computing infrastructures and remotely accessible from computers in the Hall building teaching labs, ENCS general labs, and/or student's personal laptops.

10. BUDGET ESTIMATES

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)		\$ 131,145	\$ 314,748	\$ 545,563	\$ 657,692	\$ 710,806	\$ 2,359,954
Grants							
Teaching Grant (WFTE)		\$ 376,032	\$ 902,478	\$ 1,564,294	\$ 1,885,802	\$ 2,038,095	\$ 6,766,701
Support Grant (FTE)		\$ 103,777	\$ 249,064	\$ 431,710	\$ 520,439	\$ 562,469	\$ 1,867,458
Total grants		\$ 479,809	\$ 1,151,541	\$ 1,996,005	\$ 2,406,241	\$ 2,600,564	\$ 8,634,159
Additional Funding External	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Revenue	\$ -	\$ 610,954	\$ 1,466,289	\$ 2,541,568	\$ 3,063,933	\$ 3,311,370	\$ 10,994,114
EXPENSES	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TEACHING							
Tenure Track	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Extended Term Contrats	\$ -	\$ -	\$ 59,993	\$ 59,993	\$ 59,993	\$ 59,993	\$ 239,970
Limited Term Contracts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Course remissions	\$ 6,250	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 68,750
Technical support	\$ -	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 271,886
Part Time Contracts	\$ -	\$ -	\$ 12,500	\$ 18,750	\$ 18,750	\$ 18,750	\$ 68,750
Teacher's Assistants	\$ -	\$ 29,000	\$ 43,500	\$ 72,500	\$ 72,500	\$ 72,500	\$ 290,000
ADMIN STAFF							
Administrative Staff	\$ -	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 189,450
Total Payroll	\$ 6,250	\$ 133,767	\$ 220,760	\$ 256,010	\$ 256,010	\$ 256,010	\$ 1,128,806
OTHER EXPENSES							
Total Other Expenses	\$ 130,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 280,000
Total Expenses	\$ 136,250	\$ 163,767	\$ 250,760	\$ 286,010	\$ 286,010	\$ 286,010	\$ 1,408,806
CONCORDIA UNIVERSITY SURPLUS / (DEFICIT)	\$ (136,250)	\$ 447,187	\$ 1,215,529	\$ 2,255,558	\$ 2,777,924	\$ 3,025,360	\$ 9,585,308

Budget Rationale

The budget as presented accounts for the full costs of the program. However, it does not include the capital costs of existing equipment invested in the Cybersecurity Center labs including equipment in the server room. Additional funds might be needed in year 3 if the enrollments are significantly higher than expected in the budget. Further, the teaching costs for the program are represented in full, whether or not the capacity already exists to teach some of the courses, or courses are offered by other departments. The course sessions have been allocated in the budget to tenure track, extended term appointment, and part-time faculty. Teaching assistant needs have been based on an estimate of two TAs per course on 50-hour contracts. The budget is based on the current year's hourly rate.

The rationale for administrative and technical staff has been made in a previous section. Software licencing costs are not included since they are paid by research projects by the faculty members who use the Labs for research and supervising students. However, we added operating budget cost line (under Other Expenses) starting in year 0 and are required annually: \$10K for IT software; \$10K for library requisitions; \$10K for marketing and recruitment. A \$100K start-up cost (under Other Expenses) has also been added to year 0 for new classrooms, renovation and purchasing lab equipment. So, for year 0, \$130K is allocated to the budget under Other Expenses.

We expect high enrolments in this program. Given the market analysis and surveys from both students and industry experts. We estimate a full cohort to reach 100 students. Once full, and accounting for a 10% attrition rate annually, this will result in about 325 active students in the program each year. This is the maximum number of students that we can manage without requests for additional resources in the form of tenure track faculty members and lab space. As it is, this number of students will require the labs to be running full-time at maximum capacity.

10.1. APPENDICES

- Appendix 1: Material Safety Data Sheet
- Appendix 2: Official description of the program
- Appendix 3: Course outlines and descriptions
- Appendix 3A: CIPS graduate attributes mapping tables
- Appendix 4: Research protocols and agreements
- Appendix 5: Needs Analysis, Surveys, Market Analysis, Environmental Scans, Lightcast Job Posting Reports
- Appendix 6: Letters of Support and Library Report
- Appendix 7: Tables of Grants and Contributions to Research and Faculty Training
- Appendix 8: Faculty CVs
- Appendix 9: List of external persons consulted in the preparation of the program proposal
- Appendix 10: Letters of employment
- Appendix 11: Full detailed program expenses and revenues

Summary of Changes (New Undergraduate Program (Regular Process))

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
Cybersecurity Core	X	X	X
Cybersecurity Complementary Core	X	X	X
Cybersecurity Electives	X	X	
Mathematics Electives: BSc Cybersecurity	X	X	
General Electives: BSc Cybersecurity	X	X	X
General Electives Exclusion List: BSc Cybersecurity	X	X	

PROGRAM CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BSc in Cybersecurity

Calendar Section Name: BSc in Cybersecurity

Calendar Section Type: Program

Description of Change: BSc in Cybersecurity - Degree requirements

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Program Name: BSc in Cybersecurity

Planning and Promotion: 01 Jan 0001

Program Type: None

Effective/Push to SIS date: 01 Jan 0001

Degree: None

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BSc in Cybersecurity Engineering) > Degree Requirements

Type of Change: New Program

Present Text calendar

credits

0

Proposed Text

90 BSc in Cybersecurity
credits

⊖ 22.5 credits from the Cybersecurity Core

30 credits from the Cybersecurity Complementary Core

9 credits chosen from Cybersecurity Electives

9 credits chosen from Mathematics Electives: BSc Cybersecurity

19.5 credits chosen from General Electives: BSc Cybersecurity

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BSc in Cybersecurity

Calendar Section Name: Cybersecurity Core

Calendar Section Type: Defined group

Description of Change: Cybersecurity Core

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BSc in Cybersecurity Engineering) > Degree Requirements > BSc in Cybersecurity

Type of Change: New Defined Group

Present Text calendar

Proposed Text

0	22.5 credits	Cybersecurity Core
	0	INSE 201 Security Ethics, Laws, Standards and Compliance (1.5) INSE 221 Cryptography I (3) INSE 321 Cryptography II (3) INSE 331 Database Security (3) INSE 349 Secure Programming and Software Design (3) INSE 351 Operating System Security (3) INSE 413 Security Auditing and Compliance (3) INSE 445 Network Security (3)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BSc in Cybersecurity

Calendar Section Name: Cybersecurity Complementary Core

Calendar Section Type: Defined group

Description of Change: Cybersecurity Complementary Core

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BSc in Cybersecurity Engineering) > Degree Requirements > BSc in Cybersecurity

Type of Change: New Defined Group

Present Text calendar

Proposed Text

30	Cybersecurity Complementary Core
credits	
0	COMP 228 System Hardware (3)
	COMP 232 Mathematics for Computer Science (3)
	COMP 248 Object-Oriented Programming I (3.5)
	COMP 249 Object-Oriented Programming II (3.5)
	COMP 346 Operating Systems (4)
	COMP 348 Principles of Programming Languages (3)
	COMP 352 Data Structures and Algorithms (3)
	COMP 445 Data Communication and Computer Networks (4)
	ENCS 282 Technical Writing and Communication (3)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BSc in Cybersecurity

Calendar Section Name: Cybersecurity Electives

Calendar Section Type: Defined group

Description of Change: Cybersecurity Electives

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BSc in Cybersecurity Engineering) > Degree Requirements > BSc in Cybersecurity

Type of Change: New Defined Group

Present Text calendar

Proposed Text

0

credits Cybersecurity Electives

0 Students must complete 9 credits from the following:

INSE 401 Usability and Human Aspects of Security (3)

INSE 411 Privacy: Enhancing Technologies, Analysis and Measurement (3)

INSE 412 Cybercrime and Digital Forensics (3)

INSE 441 Mobile Security and Privacy (3)

INSE 442 Reverse Engineering, Application and Malware Analysis (3)

INSE 452 Penetration Testing and Ethical Hacking (3)

INSE 481 Blockchain Technologies and Applications (3)

INSE 482 Industrial Control Systems and Critical Infrastructure (3)

INSE 483 IoT and Embedded System Security (3)

INSE 484 Quantum Computing and Security (3)

INSE 485 Cybersecurity of Health-Care Systems and Devices (3)

INSE 486 Cybersecurity Management and Governance (3)

INSE 490 Capstone Cybersecurity Engineering Design Project (6)

INSE 498 Topics in Cybersecurity Engineering (3)

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BSc in Cybersecurity

Calendar Section Name: Mathematics Electives: BSc Cybersecurity

Calendar Section Type: Defined group

Description of Change: Mathematics Electives: BSc Cybersecurity

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BSc in Cybersecurity Engineering) > Degree Requirements > BSc in Cybersecurity

Type of Change: New Defined Group

Present Text calendar

0

Proposed Text

credits [Mathematics Electives: BSc Cybersecurity](#)

⊖ Students must complete 9 credits from the following:

[ENGR 213 Applied Ordinary Differential Equations \(3\)](#)

[ENGR 233 Applied Advanced Calculus \(3\)](#)

[ENGR 371 Probability and Statistics in Engineering \(3\)](#)

[ENGR 391 Numerical Methods in Engineering \(3\)](#)

[MAST 218 Multivariable Calculus I \(3\)](#)

[MAST 219 Multivariable Calculus II \(3\)](#)

[MAST 221 Applied Probability \(3\)](#)

[MAST 324 Introduction to Optimization \(3\)](#)

[MAST 332 Techniques in Symbolic Computation \(3\)](#)

[MAST 333 Applied Statistics \(3\)](#)

[MAST 334 Numerical Analysis \(3\)](#)

[MATH 251 Linear Algebra I \(3\)](#)

[MATH 252 Linear Algebra II \(3\)](#)

[MATH 339 Combinatorics \(3\)](#)

[MATH 366 Complex Analysis I \(3\)](#)

[MATH 392 Elementary Number Theory and Cryptography \(3\)](#)

Rationale:

The course MATH 366 was added to the Mathematics Electives: BSc Cybersecurity group after APC approval as per the recommendation of the Department of Mathematics and Statistics.

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BSc in Cybersecurity

Calendar Section Name: General Electives: BSc Cybersecurity

Calendar Section Type: Defined group

Description of Change: General Electives: BSc Cybersecurity

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BSc in Cybersecurity Engineering) > Degree Requirements > BSc in Cybersecurity

Type of Change: New Defined Group

Present Text calendar

0

Proposed Text

19.5
credits

General Electives: BSc Cybersecurity

0

General Electives must be chosen from the following lists:

Mathematics Electives: BSc Cybersecurity

General Education Electives

found in Section 71.110 Complementary Studies for Engineering and Computer Science Students .

A course outside this list qualifies as a General Elective provided that the course is explicitly listed in the Undergraduate Calendar as part of a major, minor, or specialization program, or as part of the degree requirements for a BEng program at Concordia, and provided that the course is not included in the General Electives Exclusion List below.

Rationale:

Resource Implications:

DEFINED GROUP CHANGE FORM

Dossier Type: New Undergraduate Program (Regular Process)

Dossier Title: BSc in Cybersecurity

Calendar Section Name: General Electives Exclusion List: BSc
Cybersecurity

Calendar Section Type: Defined group

Description of Change: General Electives Exclusion List: BSc
Cybersecurity

Proposed: Undergraduate Curriculum Changes

Faculty/School: Gina Cody School of Engineering and Computer Science

Department: Concordia Institute for Information Systems Engineering **Calendar publication date:** 2025/2026/Summer

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 May 2025

Path: Undergraduate > 2024-2025 Undergraduate Calendar > Faculties > Section 71 Gina Cody School of Engineering and Computer Science > Gina Cody School of Engineering and Computer Science > Section 71.100 Concordia Institute for Information Systems Engineering > Course Requirements (BSc in Cybersecurity Engineering) > Degree Requirements > BSc in Cybersecurity > General Electives: BSc Cybersecurity

Type of Change: New Defined Group

Present Text calendar

0

Proposed Text

credits [General Electives Exclusion List: BSc Cybersecurity](#)

⊖

1. The following courses may not be taken to fulfill the General Electives requirement:
[BCEE 231 Structured Programming and Applications for Building and Civil Engineers \(3.00\)](#)

[BIOL 200 Fundamentals of Human Biology \(3.00\)](#)

[BIOL 322 Biostatistics \(3.00\)](#)

[BTM 200 Fundamentals of Information Technology \(3.00\)](#)

[BTM 380 Introduction to Business Application Development \(3.00\)](#)

[BTM 382 Database Management \(3.00\)](#)

[CART 315 Digital Game Prototyping \(3.00\)](#)

[COMM 215 Business Statistics \(3.00\)](#)

[COMP 218 Fundamentals of Programming \(3.00\)](#)

[EXCI 322 Statistics for Exercise Science \(3.00\)](#)

[GEOG 264 Programming for Environmental Sciences \(3.00\)](#)

Present Text calendar

Proposed Text

INTE 296 Discover Statistics (3.00)

MATH 208 Fundamental Mathematics I (3.00)

MATH 209 Fundamental Mathematics II (3.00)

MIAE 215 Programming for Mechanical and Industrial Engineers (3.50)

PHYS 235 Object-Oriented Programming and Applications (3.00)

PHYS 236 Numerical Methods in Physics with Python (3.00)

SOCI 212 Statistics I (3.00)

2. COEN courses or INTE courses can only be taken with permission. In general, courses offered outside the Department of CSSE that contain substantial programming or computer science content may not be taken. Such courses may qualify as a General Elective only with prior written permission on a GCS Student Request form, obtainable from the Office of Student Academic Services in the Gina Cody School of Engineering and Computer Science.

3. At most, six credits of the following courses may be taken for credit towards the General Electives requirement:

FRAN 211 French Language: Elementary (6)

FRAN 212 French Language: Transitional Level (6)

FRAN 215 Langue française : niveau intermédiaire II (3)

4. ESL courses may not be taken to fulfill the General Electives requirement.

Rationale:

Courses are not being tagged to not create problems in the CCMS due to any changes to these courses while this program is pending approval.

Resource Implications:

Impact Report

Defined Groups

Cybersecurity Complementary Core

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Course Requirements (BSc in Cybersecurity Engineering) -> Degree Requirements -> BSc in Cybersecurity
Source of Impact

Cybersecurity Core

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Course Requirements (BSc in Cybersecurity Engineering) -> Degree Requirements -> BSc in Cybersecurity
Source of Impact

Cybersecurity Electives

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Course Requirements (BSc in Cybersecurity Engineering) -> Degree Requirements -> BSc in Cybersecurity
Source of Impact

Mathematics Electives: BSc Cybersecurity

Undergraduate -> 2024-2025 Undergraduate Calendar -> Faculties -> Section 71 Gina Cody School of Engineering and Computer Science -> Gina Cody School of Engineering and Computer Science -> Section 71.100 Concordia Institute for Information Systems Engineering -> Course Requirements (BSc in Cybersecurity Engineering) -> Degree Requirements -> BSc in Cybersecurity
Source of Impact

Other Units

Addition of MAST 218 to Mathematics Electives: BSc Cybersecurity requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of MAST 219 to Mathematics Electives: BSc Cybersecurity requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of MAST 221 to Mathematics Electives: BSc Cybersecurity requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of MAST 324 to Mathematics Electives: BSc Cybersecurity requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of MAST 332 to Mathematics Electives: BSc Cybersecurity requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MAST 333** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MAST 334** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MATH 251** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MATH 252** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MATH 339** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MATH 366** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **MATH 392** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 31.200 Department of Mathematics and Statistics

Addition of **ENGR 213** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **ENGR 233** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **ENGR 371** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **ENGR 391** to **Mathematics Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **ENCS 282** to **Cybersecurity Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.60 Engineering Course Descriptions

Addition of **COMP 228 to Cybersecurity Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 232 to Cybersecurity Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 248 to Cybersecurity Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 249 to Cybersecurity Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 346 to Cybersecurity Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 348 to Cybersecurity Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 352 to Cybersecurity Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **COMP 445 to Cybersecurity Complementary Core** requirement

Source of other unit Impact

- Course is housed in Section 71.70 Department of Computer Science and Software Engineering

Addition of **Section 71.110 Complementary Studies for Engineering and Computer Science Students to General Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Sub Section is housed in Section 71.110 Complementary Studies for Engineering and Computer Science Students

Addition of **General Education Electives to General Electives: BSc Cybersecurity** requirement

Source of other unit Impact

- Defined group is housed in Section 71.110 Complementary Studies for Engineering and Computer Science Students

Addition of **FRAN 211 to General Electives Exclusion List: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 31.110 Département d'études françaises

Addition of **FRAN 212** to **General Electives Exclusion List: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 31.110 Département d'études françaises

Addition of **FRAN 215** to **General Electives Exclusion List: BSc Cybersecurity** requirement

Source of other unit Impact

- Course is housed in Section 31.110 Département d'études françaises

LOI Budget Chart



NOTE : ONLY NEED TO BE POPULATED

		Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5
EXPENSES							
Teaching - Number of Full Time positions	TT %	0 50%	0 50%	0 50%	0 50%	0 50%	0 50%
	ETA %	0 50%	0 50%	1 50%	1 50%	1 50%	1 50%
	LTA %	50%	50%	50%	50%	50%	50%
	Lecturer %	50%	50%	50%	50%	50%	50%
Number of course remissions requested		0.5	1	1	1	1	1
Technical support - Number of positions		0 50%	1 50%	1 50%	1 50%	1 50%	1 50%
Part Time Contracts - Number of contracts		0 50%	0 50%	2 50%	3 50%	3 50%	3 50%
Teacher's Assistants - Hours		0	1000	1500	2500	2500	2500
Administrative Staff - Number of positions	Director %	50%	50%	50%	50%	50%	50%
	Office support %	0 50%	1 50%	1 50%	1 50%	1 50%	1 50%
	Professional %	0 50%	0 50%	0 50%	0 50%	0 50%	0 50%

Comments

Resources are shared between engineering and Science programs
Resources are shared between engineering and Science programs
Program director (1); New hires (2 + 1), 50%

LOI Budget Chart

EXPENSES		Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total	
TEACHING		Salary		Salary and Benefits					
Tenure Track	\$ 125,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Extended Term appointment	\$ 95,000	\$ -	\$ -	\$ 59,993	\$ 59,993	\$ 59,993	\$ 59,993	\$ 239,970	
Limited Term Appointment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Lecturer	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Course remissions	\$ 12,500	\$ 6,250	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 68,750	
Technical support	\$ 86,108	\$ -	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 271,886	
Part Time Contracts	\$ 12,500	\$ -	\$ -	\$ 12,500	\$ 18,750	\$ 18,750	\$ 18,750	\$ 68,750	
Teacher's Assistants	\$ 29,000	\$ -	\$ 29,000	\$ 43,500	\$ 72,500	\$ 72,500	\$ 72,500	\$ 290,000	
Stipends	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
ADMIN STAFF									
Director	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Office support	\$ 60,000	\$ -	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 189,450	
Professional	\$ 89,108	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Payroll		\$ 6,250	\$ 133,767	\$ 220,760	\$ 256,010	\$ 256,010	\$ 256,010	\$ 1,128,806	
OTHER EXPENSES									
New Classroom, renovation and lab equipment - NON-CAPITAL								\$ -	
New Classroom, renovation and lab equipment - CAPITAL	\$ 100,000							\$ 100,000	
Rent								\$ -	
Taxes								\$ -	
Maintenance-Security								\$ -	
Operating cost	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 180,000	
Other								\$ -	
Total Other Expenses		\$ 130,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 280,000	
Total Expenses		\$ 136,250	\$ 163,767	\$ 250,760	\$ 286,010	\$ 286,010	\$ 286,010	\$ 1,408,806	

New teaching lab

Software licenses

LOI Budget Chart

0
0

NOTE : ONLY NEED TO BE POPULATED

		Year 1	Year 2	Year 3	Year 4	Year 5	Comments	
STUDENTS								
Cycle 1 FTE (FTE = 30 credits)								
New Cycle 1 FTE registered in the program		50	75	100	100	100		
Total credits for Program		90						
Attrition rate		10%						
TOTAL FTE		50.00	120.00	208.00	250.75	271.00		
Program Family								
Computer science		2.10						
Weighted FTE								
		105.00	252.00	436.80	526.58	569.10		
REVENUE								
		Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee								
Tuition (FTE)		\$ 2,623	\$ 131,145	\$ 314,748	\$ 545,563	\$ 657,692	\$ 710,806	\$ 2,359,954
Grants								
Teaching Grant (WFTE)		\$ 3,581	\$ 376,032	\$ 902,478	\$ 1,564,294	\$ 1,885,802	\$ 2,038,095	\$ 6,766,701
Support Grant (FTE)		\$ 2,076	\$ 103,777	\$ 249,064	\$ 431,710	\$ 520,439	\$ 562,469	\$ 1,867,458
Total grants			\$ 479,809	\$ 1,151,541	\$ 1,996,005	\$ 2,406,241	\$ 2,600,564	\$ 8,634,159
External								\$ -
Total Revenue		\$ -	\$ 610,954	\$ 1,466,289	\$ 2,541,568	\$ 3,063,933	\$ 3,311,370	\$ 10,994,114
Additional Funding								
Internal								
Provost Office								\$ -
Institutional								\$ -
Capital Fund (1)								\$ -
Other								\$ -
Total internal sources of funding for the faculty		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Program Financial Viability

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)		\$ 131,145	\$ 314,748	\$ 545,563	\$ 657,692	\$ 710,806	\$ 2,359,954
Grants							
Teaching Grant (WFTE)		\$ 376,032	\$ 902,478	\$ 1,564,294	\$ 1,885,802	\$ 2,038,095	\$ 6,766,701
Support Grant (FTE)		\$ 103,777	\$ 249,064	\$ 431,710	\$ 520,439	\$ 562,469	\$ 1,867,458
Total grants		\$ 479,809	\$ 1,151,541	\$ 1,996,005	\$ 2,406,241	\$ 2,600,564	\$ 8,634,159
Additional Funding External	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Revenue	\$ -	\$ 610,954	\$ 1,466,289	\$ 2,541,568	\$ 3,063,933	\$ 3,311,370	\$ 10,994,114

EXPENSES	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TEACHING							
Tenure Track	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Extended Term Contrats	\$ -	\$ -	\$ 59,993	\$ 59,993	\$ 59,993	\$ 59,993	\$ 239,970
Limited Term Contracts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Course remissions	\$ 6,250	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 68,750
Technical support	\$ -	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 54,377	\$ 271,886
Part Time Contracts	\$ -	\$ -	\$ 12,500	\$ 18,750	\$ 18,750	\$ 18,750	\$ 68,750
Teacher's Assistants	\$ -	\$ 29,000	\$ 43,500	\$ 72,500	\$ 72,500	\$ 72,500	\$ 290,000
ADMIN STAFF							
Administrative Staff	\$ -	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 37,890	\$ 189,450
Total Payroll	\$ 6,250	\$ 133,767	\$ 220,760	\$ 256,010	\$ 256,010	\$ 256,010	\$ 1,128,806
OTHER EXPENSES							
Total Other Expenses	\$ 130,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 280,000
Total Expenses	\$ 136,250	\$ 163,767	\$ 250,760	\$ 286,010	\$ 286,010	\$ 286,010	\$ 1,408,806
CONCORDIA UNIVERSITY SURPLUS / (DEFICIT)	\$ (136,250)	\$ 447,187	\$ 1,215,529	\$ 2,255,558	\$ 2,777,924	\$ 3,025,360	\$ 9,585,308

Faculty Financial Viability

ADDITIONAL BASE FUNDING	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Additional Base Fundin	\$ 900		\$ 45,000	\$ 108,000	\$ 187,200	\$ 225,675	\$ 565,875
Additional Base Fundin	\$ 1,200		\$ 126,000	\$ 302,400	\$ 524,160	\$ 631,890	\$ 1,584,450
Additional Base funding - full time TT Hire	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Additional Provost, External, Capital or Institutional f	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Additionnal Funding	\$ -	\$ -	\$ 171,000	\$ 410,400	\$ 711,360	\$ 857,565	\$ 2,150,325

ADDITIONAL EXPENSES	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Payroll	\$ 6,250	\$ 133,767	\$ 220,760	\$ 256,010	\$ 256,010	\$ 256,010	\$ 1,128,806
Other Expenses	\$ 130,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 280,000
Total Expenses	\$ 136,250	\$ 163,767	\$ 250,760	\$ 286,010	\$ 286,010	\$ 286,010	\$ 1,408,806
FACULTY SURPLUS / (DEFICIT)	\$ (136,250)	\$ (163,767)	\$ (79,760)	\$ 124,390	\$ 425,350	\$ 571,555	\$ 741,519

Appendix 2: Official Program Description

Cybersecurity is a science and engineering discipline that applies the principles of engineering and natural sciences for safeguarding computers, electronic communication systems, and data from harm, unauthorized access, and manipulation. Its focus includes ensuring the availability, integrity, authenticity, confidentiality, and non-repudiation of information within electronic communications and systems. As an integral component of contemporary life, cybersecurity has emerged as a rapidly expanding industry, reflecting its essential role in safeguarding digital infrastructure worldwide.

This program will appeal to students looking for jobs like cybersecurity analysts, security/network/system administrators, and security specialists in cloud/database/software, among others. Graduates from this program are also capable of carrying out tasks involved in operations, development, planning, and technical support. Given the pervasive nature of cybersecurity across organizations and businesses, cybersecurity engineers find employment in sectors related to IT/OT, such as management, banking, healthcare, insurance, policy, and more. Their training and skills frequently complement those of decision-makers and executives in ensuring the secure operation of businesses. As a comprehensive program covering all theoretical foundations of cybersecurity, the BSc program will also appeal to students who plan to apply for graduate schools directly after obtaining the bachelors.

The Cybersecurity BSc curriculum brings together both general computer science principles and specialized cybersecurity focuses, which allow students to obtain advanced knowledge in fields of interest and expected future activities in a variety of difference domains, including information security, critical infrastructure security, network security, application security, storage security, cloud security, Internet of Things (IoT) security, mobile security, etc.

Appendix 3: Course outlines and descriptions

<p style="text-align: center;">Concordia Institute for Information Systems Engineering INSE 201 – Security Ethics, Laws, Standards and Compliance (1.5 credits)</p>
<p><i>Course Instructor: Rachida Dssouli</i> rachida.dssouli@concordia.ca <i>Office: EV 7.627</i></p>
<p>Office Hours: <i>Virtual on Zoom (link will be posted on Moodle). For in-person meeting, please email.</i></p>
<p>Tutorials: Please see your class schedule for details</p>
<p>Labs: Please see your class schedule for details</p>
<p>Course Calendar Description:</p> <p>This course covers ethical professional practices and responsibilities for engineers working within Quebec and Canadian legislative frameworks, touching of four main topics: professional systems, the ethics of engineering, the professional duties of an engineer, as well as the legal dimensions of professional practice. Throughout the course, we will cover ethics, law, professional standards, and regulating human conduct. We will also address several ethical concerns and challenges in cybersecurity. These issues pervade numerous aspects of the economy and society in the information age, covering a wide range of topics from human rights to international trade. Students will learn about these topics, beginning with an acquaintance with the dominant ethical frameworks of the 21st century, then employing these frameworks to understand, analyze, and develop solutions for leading ethical problems in cybersecurity. Students will also be exposed to the best practices for an ethical cybersecurity using scenarios.</p>
<p>Prerequisites: N/A Co-requisites: N/A</p>
<p>Specific Knowledge and Skills Needed for this Course: Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.</p> <p><i>Insert specific knowledge and skills here</i> N/A</p>

Course materials Required

Textbook: N/A

1. Lecture slides and other related materials will be made available via the course Moodle site.
2. Manjikian, Mary. Cybersecurity ethics: an introduction. Routledge, 2017.
3. Shannon Vallor and William J. Rewak, An Introduction to Cybersecurity Ethics. Available online <https://www.scu.edu/media/ethics-center/technology-ethics/IntroToCybersecurityEthics.pdf> <https://www.scu.edu/media/ethics-center/technology-ethics/IntroToCybersecurityEthics.pdf>
4. Cybersecurity laws in Canada 2024
<https://iclg.com/practice-areas/cybersecurity-laws-and-regulations/canada#:~:text=Cybercrime,-1.1%20Would%20any&text=Yes%2C%20it%20is%20an%20offence,C%2D46>

Grading Scheme

1. 25%: Project (may include programming, report writing, in-person presentations)
2. 35%: Quiz 1
3. 40%: Quiz 2

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule (subject to modification)

1. Introduction to ethics
2. Professional practice and responsibility for engineering in Quebec (OIQ).
3. Cybersecurity Laws and Regulations Canada
4. The problem of privacy (Online privacy: definition, and debate for and against. Online privacy tools such as TOR, Deep Web, Dark Web, user tracking, the European General Data Protection Regulation (GDPR), IoT privacy, ethical considerations of sharing data for cybersecurity research, Health information privacy (HIPPA))
5. The problem of (mass) surveillance (Debate for and against. Encryption laws and policies, Key escrow, backdoors, Apple vs FBI case study)
6. The problem of online piracy (Debate for and against. File sharing networks)
7. The problem of cyberwarfare (It is a war but what is considered legal in the eyes of international law)
8. Cybersecurity professionals' obligations to the public and ethical best practices (Ethical hacking, responsible disclosure, risk consideration, accountability, etc.). Cybersecurity code of conduct.
9. Case studies (e.g., Security and privacy tradeoffs in medical devices; ethical issues in cyber-physical systems)

Lab Details

N/A

Engineering Tools

N/A

**Details on assessment tools:
See under “Grading Scheme”**

Other information

N/A

This semester this course will emphasize and develop the Canadian Engineering Accreditation Board (CEAB) graduate attributes of Ethics and Equity, Professionalism, and Life-long Learning.

The ethics and equity attribute is defined by the CEAB as: An ability to apply professional ethics, accountability, and equity. More specifically, students will be assessed on their abilities to:

- Understand what ethics are
- Differentiate between ethics, morals, values, and law
- Identify theoretical basis for ethical reasoning
- Apply ethical reasoning to resolve professional dilemmas
- Understand of accountability to the engineering profession
- Understand of accountability to the public
- Appreciate challenges to accountability in organizations
- Apply accountability to professional context
- Identify professional obligations against discrimination
- Appreciate gender dimensions of equity

This attribute will be assessed in quizzes and the final examination.

The professionalism attribute is defined by the CEAB as: An understanding of the roles and responsibilities of the professional engineer in society, especially the primary role of protection of the public and the public interest. More specifically, students will be assessed on their abilities to:

- Appreciate the role filled by professional engineers in society
- Describe the role of engineers in Quebec's professional system
- Differentiate between professional and personal roles
- Distinguish between dimensions of responsibility – moral, legal & social
- Identify legal issues on occupational safety and intellectual property
- Apply responsibility in professional context
- Demonstrate a good understanding of liability in Quebec's legal system
- Communicate through accepted professional means.
- Identify relevant professional standards

This attribute will be assessed in tutorials, quiz 1 and quiz 2.

The life-long learning attribute is defined by the CEAB as: An ability to identify and to address their own educational needs in a changing world, sufficiently to maintain their competence and contribute to the advancement of knowledge. More specifically, students will be assessed on their abilities to:

- Assess a physical problem and identify the knowledge necessary to solve it
- Self-acquire necessary information from different sources
- Show awareness of various engineering organizations for training opportunities

This attribute will be assessed in the "Knowledge Quest" portion of the online course material.

Course Learning Outcomes (CLOs):

By the end of this course, learners will be able to:

1. Describe the main features of the Professional Order of Engineers in Quebec and Canada
2. Analyze ethical dilemmas in the field of engineering using ethical reasoning
3. Identify the professional duties and obligations of an engineer
4. Recognize the legal dimensions of professional practices.

In addition, students are expected to master cybersecurity ethics and actual Canadian law related to computer crimes.

1. Cybersecurity Ethics challenges
2. Actual cybersecurity code of conduct
3. Actual Canadian law related to cybersecurity and computer crimes
4. Understanding the limitations of cybersecurity ethics framework.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 221 Cryptography I (3 credits)**

Course Instructor:

Ayda Basyouni

ayda.basyouni@concordia.ca

Office Hours:

Monday 13:00-14:30

Tutorials:

Please see your class schedule for details

Tutors: TBA

Course Calendar Description:

Introduction (cryptology, cryptography, cryptanalysis, confidentiality, integrity, authentication, non-repudiation); mathematical background (modular arithmetic, basic algorithms, including Euclidean algorithm, extended Euclidean algorithm, square and multiply, Chinese remainder theorem); historical ciphers (shift cipher, substitution cipher, affine cipher, Vigenere cipher, number theory problems (DLP, DHP, DDH, integer factorization); public key cryptography (RSA encryption, El-Gamal encryption); public key cryptography (digital signature schemes); cryptographic protocols (PKI, authentication protocols: challenge response, nonces, time stamps); symmetric key ciphers (block ciphers: DES, SPN, AES, lightweight ciphers); stream ciphers, hash functions, MAC; side channel attacks.

Prerequisites: COEN 231 or COMP 232

Specific Knowledge and Skills Needed for this Course:

Although there are no formal course pre-requisites for this class, students are expected to have basic mathematics fundamentals including basic algebra and basic probability theory; familiarity with modular arithmetic, number theory, and the concept of mathematical proofs.

Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Course Materials

Optional Textbook(s):

[1] Smart, Nigel P. *Cryptography made simple*. Springer publication, 2016.

[2] Menezes, Alfred J., Paul C. Van Oorschot, and Scott A. Vanstone. *Handbook of applied cryptography*. CRC press, 2018.

[3] Stinson, Douglas R. *Cryptography: theory and practice*. Chapman and Hall/CRC, Third Edition.

Grading Scheme

Evaluation Tool	Weight
Midterm Exam	25%
Final Exam	50%
Assignments	10%
Project	15%
Total	100%

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule:

Week	Topics
1	Introduction (Basic concepts and definitions: Cryptography, Cryptanalysis, Confidentiality, Integrity, Authentication, Non-repudiation, etc)
2	Mathematical Background (Modular Arithmetic, Basic Algorithms including Euclidean algorithm, extended Euclidean algorithm, Square and Multiply, Chinese Remainder Theorem)
3	Historical ciphers (Shift cipher, Substitution Cipher, Affine Cipher, Vigenere Cipher)
4	Number Theory Problems (DLP, DHP, DDH, Integer Factorization)
5-6	Public Key Cryptography (RSA Encryption, El-Gamal Encryption)
7	Public Key Cryptography (Digital Signature Schemes)
8	Cryptographic Protocols (PKI, Authentication Protocols: Challenge Response, nonces, time stamps)
9	Symmetric Key Ciphers (Block ciphers: DES, SPN, AES, Lightweight ciphers)
10-11	Stream Ciphers, Hash Functions, MAC
12	Implementation Issues (Side Channel attacks)

Engineering Tools

Throughout the course project and assignments, students will gain experience using cryptographic libraries (e.g., OpenSSL) and number theory computational tools such as Maple.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of the Cybersecurity Engineering Undergraduate program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating the following graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Graduate Attribute	Indicators		Assessment results reported
Knowledge-base for Engineering	<ul style="list-style-type: none"> Knowledge base of mathematics. 	Intermediate	Yes
	<ul style="list-style-type: none"> Knowledge- base in a specific domain. 	Intermediate	Yes
Problem analysis	<ul style="list-style-type: none"> Problem identification and formulation. 	Intermediate	Yes
Use of Engineering tools	<ul style="list-style-type: none"> Ability to use appropriate tools, techniques and resources. 	Intermediate	Yes
	<ul style="list-style-type: none"> Ability to select appropriate tools, techniques, and resources. 	Intermediate	Yes
	<ul style="list-style-type: none"> Demonstrate awareness of limitations of tools, create and extend tools as necessary. 	Intermediate	Yes
Individual and teamwork	<ul style="list-style-type: none"> Cooperation and work ethics. 	Intermediate	Yes
	<ul style="list-style-type: none"> Contribution: practical/conceptual 	Intermediate	Yes
Ethics and equity	<ul style="list-style-type: none"> Professional ethics and accountability 	Advanced	Yes

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected:

Course Learning Outcomes	Related Graduate Attributes
Develop a strong foundation in cryptographic concepts, including confidentiality, integrity, authentication, and non-repudiation.	<ul style="list-style-type: none"> • Knowledge base of mathematics. • Knowledge- base in a specific domain. • Professional ethics and accountability
Master Public Key Cryptography with a focus on RSA and El-Gamal Encryption, as well as Symmetric Key Ciphers, covering DES, SPN, AES, and lightweight ciphers.	<ul style="list-style-type: none"> • Knowledge base of mathematics. • Knowledge- base in a specific domain. • Problem identification and formulation. • Cooperation and work ethics. • Contribution: practical/conceptual. • Professional ethics and accountability
Understand cryptographic protocols and grasp implementation issues, particularly related to side-channel attacks.	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources. • Ability to select appropriate tools, techniques, and resources. • Demonstrate awareness of limitations of tools, create and extend tools as necessary. • Cooperation and work ethics. • Contribution: practical/conceptual. • Professional ethics and accountability
Critically assess cryptographic strengths and weaknesses, demonstrating practical application by implementing and testing cryptographic algorithms in real-world scenarios.	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources. • Ability to select appropriate tools, techniques, and resources. • Demonstrate awareness of limitations of tools, create and extend tools as necessary. • Cooperation and work ethics. • Contribution: practical/conceptual. • Professional ethics and accountability

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Concordia Institute for Information Systems Engineering INSE 321 Cryptography II (3 credits)

Course Instructor:

Ayda Basyouni

ayda.basyouni@concordia.ca

Office Hours:

Monday 13:00-14:30

Tutorials:

Please see your class schedule for details

Tutors: TBA

Course Calendar Description:

This course offers students an advanced mathematical background: elliptic curves (introduction, the Group Law, elliptic curves over finite fields, projective coordinates, point compression, choosing an elliptic curve); lattices (lattices and lattice reduction), hard lattice problems, learning with errors (LWE), notions of security, post quantum cryptography, Shamir secret sharing, threshold-based cryptography; homomorphic cryptosystems; zero knowledge proofs; commitment schemes and oblivious transfer; advanced signature schemes (blind signature, group signature, ring signature); secure multi-party computation (the two-party case, the multi-party case).

Prerequisites: INSE 221

Specific Knowledge and Skills Needed for this Course:

N/A

Course materials

Some of the concepts covered in this course are not explained in textbooks. Students are expected to consult technical publications from specialized cryptographic conferences such as CRYPTO, EUROCRYPT, ASIACRYPT, and SAC.

Optional Textbook(s):

[1] Smart, Nigel P. *Cryptography made simple*. Springer publication, 2016.

[2] Menezes, Alfred J., Paul C. Van Oorschot, and Scott A. Vanstone. *Handbook of applied cryptography*. CRC press, 2018.

[3] Stinson, Douglas R. *Cryptography: theory and practice*. Chapman and Hall/CRC, Third Edition.

Grading Scheme

Evaluation Tool	Weight
Midterm Exam	25%
Final Exam	50%
Assignments	10%
Project	15%
Total	100%

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule

Week	Topics
1-3	Advanced Mathematical Background: Elliptic Curves (Introduction, The Group Law, Elliptic Curves over Finite Fields, Projective Coordinates, Point Compression, Choosing an Elliptic Curve); Lattices (Lattices and Lattice Reduction), Hard Lattice Problems, Learning With Errors (LWE); Notions of Security
4-5	Post Quantum Cryptography
6	Shamir Secret Sharing, Threshold-based Cryptography
7-8	Homomorphic Cryptosystems
9	Zero Knowledge Proofs
10	Commitment Schemes and Oblivious Transfer
11	Advanced Signature Schemes (Blind Signature, Group Signature, Ring Signature)
12	Secure Multi-party Computation (The two-party case, the Multiparty case)

Engineering Tools

Throughout the course project and assignments, students will gain experience using cryptographic libraries (e.g., OpenSSL) and number theory computational tools such as Maple.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of the Cybersecurity Engineering Undergraduate program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating the following graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Graduate Attribute	Indicators	Level of coverage	Assessment results reported
Knowledge-base for Engineering	<ul style="list-style-type: none"> • Knowledge base of mathematics. 	Advanced	Yes
	<ul style="list-style-type: none"> • Knowledge- base in a specific domain. 	Advanced	Yes
Problem analysis	<ul style="list-style-type: none"> • Problem identification and formulation. 	Advanced	Yes
Use of Engineering tools	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources. 	Advanced	Yes
	<ul style="list-style-type: none"> • Ability to select appropriate tools, techniques, and resources. 	Advanced	Yes
	<ul style="list-style-type: none"> • Demonstrate awareness of limitations of tools, create and extend tools as necessary. 	Advanced	Yes
Individual and teamwork	<ul style="list-style-type: none"> • Cooperation and work ethics. 	Advanced	Yes
	<ul style="list-style-type: none"> • Contribution: practical/conceptual. 	Advanced	Yes
Ethics and equity	<ul style="list-style-type: none"> • Professional ethics and accountability 	Advanced	Yes

Course Learning Outcomes (CLOs):

By the end of this advanced cryptography course, students are expected:

Course Learning Outcomes	Related Graduate Attributes
Develop a deep understanding of advanced mathematical cryptographic concepts, including Elliptic Curves and Lattices and associated notions of security.	<ul style="list-style-type: none"> • Knowledge base of mathematics. • Knowledge- base in a specific domain. • Professional ethics and accountability
Explore and critically analyze advanced cryptographic algorithms and cryptographic Protocols including Homomorphic Cryptosystems, Zero Knowledge Proofs, Commitment Schemes, Oblivious Transfer, and advanced signature schemes	<ul style="list-style-type: none"> • Knowledge base of mathematics. • Knowledge- base in a specific domain. • Problem identification and formulation. • Cooperation and work ethics. • Contribution: practical/conceptual. • Professional ethics and accountability
Understand the principles of Secure Multi-party Computation.	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources. • Ability to select appropriate tools, techniques, and resources. • Demonstrate awareness of limitations of tools, create and extend tools as necessary. • Cooperation and work ethics. • Contribution: practical/conceptual. • Professional ethics and accountability

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Security
INSE 331 Database Security (3 credits)**

Course Instructor:

Office Hours:

Tutorials: Please see your class schedule for details

Labs: Please see your class schedule for details

Course Calendar Description:

This course will offer students recent examples of database security issues, including a brief overview of root causes; security configuration of a typical database product; operating system security principles; administration of users at the OS level versus database level; profiles, password policies, privileges and roles; database application security models; known attacks and defences; database auditing and hardening models.

Prerequisites: INSE 349; COEN 352 or COMP 352

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Insert specific knowledge and skills here

N/A

Course materials

Required Textbook: *N/A*

Grading Scheme

1. 15%: Project (may include programming, report writing, in-person presentations)
2. 20%: midterm exam
3. 65%: final exam

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule (subject to modification)

1. Introduction: Typical database security issues faced by enterprises
2. Installing and configuring a typical database product
3. Operating system security principles
4. Administration of users
5. Profiles, password policies, privileges and roles
6. Database application security models
7. Known attacks and defences
8. Database auditing and hardening models

Lab Details

N/A

Engineering Tools

N/A

Details on assessment tools:
See under “Grading Scheme”

Other information

N/A

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of both the Computer Science and Software Engineering program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating five graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Attribute 1: Knowledge-base for Engineering. This attribute is covered through learning basic concepts in cryptography and security, and how to use these concepts in solving (relatively) small, real-world problems. It will be evaluated by exams and assignments/projects, using the following indicators: Indicator 1.1: Knowledge base of mathematics; and Indicator 1.3: Knowledge- base in a specific domain.

Attribute 2: Problem analysis. This attribute is covered through the analysis of given scenarios to find the right tools and primitives for a practical solution. This will be evaluated by assignments/projects, using the following indicator: Indicator 2.1: Problem identification and formulation.

Attribute 3: Use of Engineering tools. This attribute is covered through the identification and use of appropriate cryptographic libraries and security tools for a given problem. This will be evaluated by assignments/projects, using the following indicators: Indicator 5.1: Ability to use appropriate tools, techniques and resources; Indicator 5.2: Ability to select appropriate tools, techniques, and resources; and Indicator 5.3: Demonstrate awareness of limitations of tools, create and extend tools as necessary.

Attribute 6: Individual and team work. This attribute is covered through the successful completion and delivery of group assignments/projects. The following indicators will be used in evaluation: Indicator 6.1: Cooperation and work ethics; and Indicator 6.2: Contribution: practical/conceptual.

Attribute 10: Ethics and equity. This attribute is covered through the understanding of ethical and social issues relate to computer security and privacy. Current best practices for using security tools and application analysis will be discussed. This attribute will be evaluated by assignments/projects, using the following indicator: Indicator 10.1: Professional ethics and accountability.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following engineering concepts.

1. Understanding of current database technology and common security techniques used.
2. Understanding of the relationship between OS security, database security, and application security.
3. Understanding database security and administration.
4. Administering user profiles, password policies, privileges and roles.
5. Managing database security on application level.
6. Database auditing for security and reliability.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Textbook

The primary textbook used for the course is [1]. The book, as a coursepack, was specifically compiled by Patrick Boismenu for this course and is available online. Suggestions for additional readings will be provided for each lecture topic. There are additional useful resources on the subject that we may refer to for one concept or another throughout the class. They are listed under the “References” section: [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22].

Tentative Schedule

Week	Dates	What (lecture time)	Deliverable	Dates
1	Week of June 29	Course Introduction. Introduction to investigations and the Canadian Justice System.	Initial project out	
2.1	Week of July 6	Canadian computer crimes laws. C.E.R.T. Cybercrime case studies (ConU, DDoS)	Project topic selection due Team formation due	DNE deadline July 02
2.2	Week of July 8	Warrants; production and assistance orders. Technological crime search planning.		
3.1	Week of July 13	Forensic analysis, lessons learned.		
3.2	Week of July 15	Cybercrime case study (phishing) Investigation Report, Analysis Report		
4.1	Week of July 20	Cybercrime case study (MAC spoofer)		
4.2	Week of July 22	Quiz	Quiz 1	Wed, July 22, 24h
5.1	Week of July 27	Computer crime interviews, cybercrime Community policing, court sentencing impacts.		DISC deadline July 27
5.2	Week of July 29	Cybercrime case study		
6.1	Week of August 3	Computer crime trials, practical assessment review.		
6.2	Week of August 6	Cybercrime case study		
7.1	Week of August 10	Formalism in cybercrime investigations, Formal modeling, and event reconstruction		
7.2	Week of August 12	Quiz	Quiz 2	Wed, Aug 12, 24h
8.1	Week of August 17	Digital forensic tools and techniques		
8.2	Week of August 18	Project presentations	Project due	Fri, Aug 21, 23:59

Administrative Policies

Grading

Grades will be based on the following components:

1. Quizzes [40%]: 2 quizzes (approx 1-hr each, closed book), 20% each
2. Project [60%]: one nearly course-long group project
3. Failing grade: lack of regular effort will result in the failing grade. Specifically, in order to pass the course you must receive at least 50% of the overall possible marks.

NOTE: Should you fail to write a quiz and you have a valid justification (e.g., doctor’s note) then the weight of the quiz in question will be added to another quiz on the case-by-case basis.

NOTE: There is no *a priori* rule for translation of a numerical grade to a letter grade.

Electronic submission is expected via a git repo tag and EAS Additional details will be given in the class or via the mailing list. Students should be aware of the University's Code of Conduct (academic) as specified at the Academic Integrity web site, especially the parts concerning cheating, plagiarism, and the possible consequences of violating this code.

NOTE: This course outline is tentative, i.e., subject to changes and adjustments as we go along.

Contribution

In usual circumstances, it is expected that all members of a group end up with the same project mark. However, this must not be considered as a rule. For reasons of fairness, different evaluations will be considered to award those who provided outstanding input to the project, and to penalize those who provided minimal (below expectations) input to the project in case of disputes within the team. The team members would be expected to provide individual logs and timesheets of their contributions in the case of disputes.

Course Web Page and Mailing List

These are two more resources to be used frequently. The additional materials, grades, etc. will be published on the web page at: [insert the web page]

A mailing list has been created for discussion of the course topics among students and the instructors; to ask and answer questions related to the course, etc. All the announcements will be directed to that list as well. All the students and instructors must be subscribed to the mailing list.

Additional Materials

Additional materials, such as lecture notes and slides, examples, etc. will be provided by the instructor. The instructor will try his best to make the notes concise and complete as much as possible. Some materials may be borrowed from previous instructors for this or related courses, primarily Patrick Boismenu, Mourad Debbabi, and others.

The Project

The project represents the main component of the course. The project will be developed as a cooperative (group) project. Each group will be composed of about 5–7 students. More details to follow.

Disclaimer

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

Student Services

Need help? There are a variety student services available to you should you struggle through your studies and if the instructor for some reason is unable to help you. They are:

- Concordia Counseling and Development offers career services, psychological services, student learning services, etc.
<http://www.concordia.ca/students/counselling.html>
- The Concordia Library Citation and Cycle Guides:
<http://library.concordia.ca/help/citing/index.php>
- Advocacy and Support Services:
<https://www.concordia.ca/offices/advocacy.html>
- Student Success Centre:
<https://www.concordia.ca/students/success.html>
- New Student Program:
<https://www.concordia.ca/students/success/new.html>
- Office for Students with Disabilities:
<http://www.concordia.ca/students/accessibility.html>
- The Academic Integrity Website:
<http://www.concordia.ca/students/academic-integrity.html>
- Financial Aid & Awards:
<http://www.concordia.ca/offices/faao.html>
- Health Services:
<https://www.concordia.ca/students/health.html>

References

- [1] Patrick Boismenu. *INSE691E: Cybercrime Investigation, Lecture Notes*. Concordia University, 2012.
- [2] Steven Anson, Steve Bunting, Ryan Johnson, and Scott Pearson. *Mastering Windows Network Forensics and Investigation*. Sybex, 2 edition, June 2012.
- [3] Corey Thuen. Understanding counter-forensics to ensure a successful investigation. [online], University of Idaho, 2007. <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.138.2196>.
- [4] Craig D. Ball. Helping lawyers master technology. [online], blog, column, publications, 2006–2013. http://www.craigball.com/Ball_Technology.
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- [16] Mourad Debbabi. INSE 6150: Lecture 6: Formal analysis (II). Concordia Institute for Information Systems Engineering, Concordia University, Montreal, Canada, 2006. <http://www.ciise.concordia.ca/~debbabi>.
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- [20] Marc-André Laverdière, Serguei A. Mokhov, Djamel Bendredjem, and Suhasini Tsapa. Ftklipse – Forensic Toolkits Eclipse Plug-ins. SourceForge.net, 2005–2008. <http://ciisec.svn.sourceforge.net/viewvc/ciisec/forensics>, last viewed April 2008.
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<p>INSE 349 Secure Programming and Software Design</p> <p>(Should be cross-listed with INSE6600 if already approved)</p> <p>Concordia Institute for Information Systems Engineering</p> <p>Term: TBD</p>
<p>Course Instructor: <i>Instructor</i> <i>instructor@ciise.concordia.ca</i></p>
<p>Office Hours: <i>Monday 10:0 am-11:30 am</i></p>
<p>Tutorials: Please see your class schedule for details Tutors: TBA</p>
<p>Course Calendar Description: Fundamentals of secure programming. String-related vulnerabilities and defense. Pointer-related vulnerabilities and defense. Memory management-related vulnerabilities and defense. Integer-related security issues. Formatted output-related security issues. Concurrency-related security issues. Security Vulnerabilities and Linking. Security in Sockets programming. Security Vulnerabilities and Signals. File I/O Security. Best practices and coding standards. Design principles for secure programming. Model-based secure programming. Static Analysis for secure programming. A project.</p>
<p>Prerequisites: INSE 221: Cryptography I</p>
<p>Specific Knowledge and Skills Needed for this Course:</p> <p>Students taking this course are expected to have sufficient knowledge of programming in C and C++</p> <p>Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.</p>
<p>Course materials Recommended Textbook:</p> <p>Robert C. Seacord, Secure Coding in C and C++ 2nd Edition, Addison-Wesley, ISBN: 0321335724.</p>
<p>Grading Scheme</p> <p>50%: Final exam 25%: Midterm exam 10%: Assignments 15%: Project</p>

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule

Week 1: Introduction to secure programming

Week 2: String-related vulnerabilities and defense (Common string manipulation errors, string vulnerabilities, mitigation strategies, runtime protection strategies)

Weeks 3-4: Pointer-related vulnerabilities and defense (Pointer subterfuge, related vulnerabilities, mitigation strategies)

Week 5: Memory management-related vulnerabilities and defense (Common memory management errors, buffer overflow, mitigation strategies)

Weeks 6-7: Integer security (Integer vulnerabilities, mitigation strategies) and midterm exam

Weeks 8-9: Formatted output security (Format string vulnerabilities, stack randomization, mitigation strategies)

Week 10: Concurrency and socket security (Race condition vulnerabilities, mitigation strategies, socket security)

Week 11: File I/O security (Access control, managing permissions, mitigation strategies)

Week 12: Best practices in secure programming

Engineering Tools

Throughout the course project and assignments, students will gain experience using various free/open-source software vulnerability (static and dynamic) analysis tools.

Graduate Attributes:

While there are currently no Graduate Attributes for Cybersecurity Engineering undergraduate programs in Canada, the following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of the Cybersecurity Engineering Undergraduate program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating the following graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Attribute 1: Knowledge-base for Engineering. This attribute is covered through learning basic concepts in secure programming. It will be evaluated by exams and assignments/projects, using the following indicators: Indicator 1.3: Knowledge- base in a specific domain.

Attribute 2: Problem analysis. This attribute is covered through the analysis of given scenarios to find the right tools for a practical analysis and security solution. This will be evaluated by assignments/projects, using the following indicator: Indicator 2.1: Problem identification and formulation.

Attribute 3: Use of Engineering tools. This attribute is covered through the identification and use of security vulnerability analysis tools suitable for a given problem/setup. This will be evaluated by assignments/projects, using the following indicators: Indicator 5.1: Ability to use appropriate tools, techniques and resources; Indicator 5.2: Ability to select appropriate tools, techniques, and resources; and Indicator 5.3: Demonstrate awareness of limitations of tools, create and extend tools as necessary.

Attribute 6: Individual and teamwork. This attribute is covered through the successful completion and delivery of group assignments/projects. The following indicators will be used in evaluation: Indicator 6.1: Cooperation and work ethics; and Indicator 6.2: Contribution: practical/conceptual.

Attribute 10: Ethics and equity. This attribute is covered through the understanding of ethical and social issues relate responsible disclosure and bug bounty processes. Current best practices will be discussed. This attribute will be evaluated by assignments/projects, using the following indicator: Indicator 10.1: Professional ethics and accountability.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following concepts in secure programming:

1. Grasp essential secure programming principles, emphasizing the significance of security in software development.
2. Identify and address common vulnerabilities, including string manipulation errors, pointer subterfuge, memory management issues, integer vulnerabilities, and format string vulnerabilities.
3. Apply secure programming principles through practical examples and hands-on exercises, developing problem-solving skills and effective testing strategies.
4. Implement security techniques for formatted output, concurrency, socket operations, and file I/O, covering mitigation strategies and access control measures.
5. Integrate best practices seamlessly into software development, emphasizing security considerations throughout the software development life cycle.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Course number	Course Title	Term
INSE 351	Operating System Security (3 credits)	

Course Instructor	Office	E-Mail	Office Hours

CLASS, LAB, AND TUTORIAL SCHEDULE					
Section	Day	Time	Location	Instructor	E-mail
Lecture					
Tutorial					
Tutorial					
Labs					Lab Start Date
Lab A					
Lab B					
Lab C					
Lab D					
Lab E					

COURSE CALENDAR DESCRIPTION
<p>This course includes topics such as authentication, confidentiality, integrity, access control matrix, safety result, access control list, capability list, Windows security, UNIX/Linux security, security levels, mandatory/discretionary access control, integrity levels, BLP, Biba, conflict of interest, security design principle, password security, strong authentication, dictionary attack, password salt, one-time password, Lamport's scheme, challenge response, logging and auditing, host-based intrusion detection, anomaly detection, misuse detection, memory security, secure booting, UNIX network security services and firewall, covert channel, and information flow control.</p>

PREREQUISITES
INSE 349; COEN 346 or COMP 346

TEXTBOOK AND ADDITIONAL COURSE MATERIALS
<ul style="list-style-type: none"> • <u>Required textbook(s):</u> <ul style="list-style-type: none"> ○ Textbook: Introduction to Computer Security ○ Authors: M.Bishop ○ Publisher: Addison-Wesley (2005) ○ Copies are available at Concordia University bookstore.

- Suggested Textbook:
- Instructor's lecture notes:
Other references will be provided on the class webpage.
- Software Use:

KNOWLEDGE BASE FOR ENGINEERING PREREQUISITES

GRADING POLICY

Evaluation Tool	Weight
Midterm 1	35
Midterm 2	35
ASPEN Project	15
Assignments	10
Tutorials	5
Total	100

Passing Criteria:

- If your total score before the final exam is less than 40% and you decide to defer the final exam, you will receive an **R** grade which prevents you to defer the final exam.
- In order to pass the class, both your cumulative score and the final examination must be above 50%.

GRADUATE ATTRIBUTES: SKILLS TO LEARN AND/OR UTILIZE

Graduate Attribute	Indicators
A knowledge base for engineering	Knowledge base in specific domain (Introduce)
	Knowledge base of natural science (Introduce)
Problem analysis	Problem identification and formulation (Introduce)
	Modelling (Introduce)
	Problem solving (Introduce)
	Analysis (uncertainty and incomplete knowledge) (Introduce)
Design	Define the objective (Introduce)
	Idea generation and selection (Introduce)
	Detailed design (Introduce)
	Validation and implementation (Introduce)
Use of engineering tools	Ability to select appropriate engineering tools, techniques, and resources (Introduce)

Professionalism	Role and responsibilities of the professional engineer (Introduce)
Impact of engineering on society & the environment	Awareness of society and environment (Introduce)
	Sustainability in design (Introduce)
Life-long learning	Identifying missing knowledge and learning opportunities (Introduce)

COURSE LEARNING OUTCOMES (CLOS) <i>By the end of this course students will be able to:</i>	
Course Learning Outcome	Relationship to Graduate Attributes
A. Understand basic operating system security concepts such as security objectives, security threats, security models, security policies, security mechanisms, and human factors	A knowledge base for engineering Knowledge base in specific domain
B. Recognize what security objectives are involved in addressing an operating system security incident and identify the corresponding security threats and human factors that may be involved	Problem analysis Problem identification and formulation Life-long learning Identifying missing knowledge and learning opportunities
C. Understand the security requirements of a given operating system in terms of authentication, access control, logging/auditing, and host-based attack detection, and	A knowledge base for engineering Knowledge base of natural science Problem analysis Problem solving
D. Use security models to formalize the security requirement of a given operating system, and design the corresponding access control mechanisms required for achieving proper levels of security	Problem analysis Modelling Design Detailed design
E. Implement sample operating system kernel-related security attacks and develop corresponding security solutions	Problem analysis Analysis (uncertainty and incomplete knowledge) Design Define the objective Validation and implementation
F. Utilize operating system security tools to perform attack detection and analysis	Use of engineering tools Ability to select appropriate engineering tools, techniques, and resources
G. Identify how professional responsibilities relate to the field of operating system security	Professionalism Role and responsibilities of the professional engineer

H. Identify different strategies to incorporate sustainability into the design of an operating system security solution	Design Idea generation and selection Impact of engineering on society & the environment
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	Awareness of society and environment Sustainability in design
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TENTATIVE COURSE OUTLINE

Topics	Week
Introduction to system security basic concepts.	1
Access Control Matrix and Foundational Results.	2
Access Control Mechanism in UNIX.	3
Security Policies and Confidentiality Policies.	4
Integrity Policies and Hybrid Policies.	5
Midterm 1	6
Design principles and Unix Security.	7
Authentication and Identity.	8
Auditing/Logging and Vulnerability/Defense.	9
Secure Booting/Securing Network Services.	10
Odds and Ends.	11
Midterm 2	12

TERM PROJECT

Topic: Implementing Android attacks and developing defence solutions

OTHER NOTES

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**Concordia Institute for Information Systems Engineering
INSE 390 Cybersecurity Engineering Team Design Project (3 credits)**

Course Instructor:

TBD

[TBD]@concordia.ca

Office Hours:

TBD

Tutorials: Please see the class schedule for details.

Labs: N/A

Course Calendar Description:

Students work in teams to design and implement a cybersecurity project based on requirements provided by the course instructor. Each team will demonstrate the project and prepare adequate documentation for it. In addition, each team will write a report based on the process of development.

Component(s): Lecture 3 hours per week; Tutorial 2 hours per week.

Notes: All written documentation must follow the Concordia Form and Style guide. Students are responsible for obtaining this document before beginning the project.

Prerequisites: INSE 331, INSE 351; ENCS 282; ENGR 371

Co-requisites: INSE 445

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Programming
- Computer architecture and operating systems
- Communication networks and protocols
- Baseline security controls (access control, cryptography, firewalls, etc.)

Course materials

- **Required textbook:** N/A
- **Suggested textbook:** To be determined by the course instructor.

- **Instructor’s lecture notes:** Will be posted on the Moodle course site.
- **Lab manual:** N/A.
- **Software use:** To be determined by the course instructor.

Grading Scheme

Assessment Tool	Weight
Project proposal	20%
Assignments	20%
Final design presentation	30%
Final design documentation	30%

Tentative Course Schedule

Topic(s)	Week
Introduction to projects, team formation, project bidding/assignment, and introduction to Scrum/Agile development	1
Lecture on cybersecurity application design and development	2
Team presentations on project proposals with architectural design	3
Lecture on cybersecurity application validation and deployment; Assignment 1	4
Team presentations on functional requirements and deliverables	5
Lecture on cybersecurity in product lifecycle and supply chain	6
Team presentations on project progress	7
Lecture on usability and human factors in cybersecurity designs; Assignment 2	8
Team presentations on project progress	9
Project demonstrations and feedback	10
Team presentations on project progress	11
Project final presentation and documentation submission	12

Lab Details: N/A

Engineering Tools: N/A

Details on assessment tools:
See under “Grading Scheme”

Other information
N/A

Graduate Attributes

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate Attribute	Indicators	Level of Coverage
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A knowledge base for engineering	<ul style="list-style-type: none"> • Knowledgebase in a specific domain 	Intermediate
Problem analysis	<ul style="list-style-type: none"> • Problem Identification and Formulation • Modeling • Problem Solving • Analysis 	Intermediate
Investigation	<ul style="list-style-type: none"> • Background and hypothesis formulation • Designing experiments • Conducting experiments and collection of data • Analysis and interpretation of data 	Intermediate
Design	<ul style="list-style-type: none"> • Problem identification and information gathering • Idea generation and selection • Detailed design • Validation and implementation 	Advanced
Use of engineering tools	<ul style="list-style-type: none"> • Ability to use appropriate engineering tools and resources • Ability to select appropriate tools, techniques, and resources 	Intermediate
Individual and teamwork	<ul style="list-style-type: none"> • Cooperation and work ethics • Contribution: practical/conceptual • Initiative and leadership • Delivering results 	Intermediate
Communication skills	<ul style="list-style-type: none"> • Documentation • Oral presentation 	Intermediate
Ethics and equity	<ul style="list-style-type: none"> • Professional ethics and accountability • Equity 	Intermediate
Economics and project management	<ul style="list-style-type: none"> • Project planning and implementation 	Intermediate

Course Learning Outcomes (CLOs):

By the end of this semester, successful students can expect to acquire the following skills in cybersecurity:

Course Learning Outcomes	Related Graduate Attributes
Analyze and design a solution for an initially unbound cybersecurity problem with a multidisciplinary nature, based on analysis of use case/requirements and following an iterative concurrent design process.	<ul style="list-style-type: none"> • Background and hypothesis formulation • Problem identification and information gathering • Modeling • Problem solving • Analysis
Implement design ideas and build realistic cybersecurity solutions	<ul style="list-style-type: none"> • Idea generation and selection • Validation and implementation
Survey the available resources for alternative solutions.	<ul style="list-style-type: none"> • Background and hypothesis formulation • Designing experiments • Conducting experiments and collection of

	<ul style="list-style-type: none"> data Analysis and interpretation of data
Complete a design project within a given time frame and budget	<ul style="list-style-type: none"> Detailed design Validation and implementation Project planning and implementation
Effectively select and apply a correct set of components to fulfill a given cybersecurity design.	<ul style="list-style-type: none"> Ability to use appropriate engineering tools and resources Ability to select appropriate tools, techniques, and resources
Execute basic testing, troubleshooting, and integration of the different modules as well as the overall system in cybersecurity applications.	<ul style="list-style-type: none"> Designing experiments Conducting experiments and collection of data Validation and implementation Analysis and interpretation of data
Participate and possibly lead a small cybersecurity team	<ul style="list-style-type: none"> Cooperation and work ethics Initiative and leadership Professional ethics and accountability Equity
Gain confidence in applying technical abilities within a realistic cybersecurity setting.	<ul style="list-style-type: none"> Contribution: practical/conceptual Documentation Oral presentation Delivering results
Prepare and present designed solutions in written documentation (e.g., technical and user manuals) and oral presentations to colleagues and managers.	<ul style="list-style-type: none"> Documentation Oral presentation Delivering results

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: [Safety Programs - Concordia University](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available to Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 401 Usability and Human Aspects of Security (3 credits)**

Course Instructor:

Office Hours:

Tutorials: Please see your class schedule for details

Labs: Please see your class schedule for details

Course Calendar Description:

This course provides students with an introduction to human aspects of security, including common evaluation methodologies for usable security; relationship between usability, deployability, and security; social engineering attacks; user study; statistical analysis for usability measurements; example evaluation of authentication in desktop versus mobile devices, browsers, email applications, and private messaging; and defenses against social engineering attacks.

Prerequisites: INSE 321

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Insert specific knowledge and skills here

N/A

Course materials

Required Textbook: *N/A*

Grading Scheme

1. 15%: Project (may include programming, report writing, in-person presentations)
2. 20%: midterm exam
3. 65%: final exam

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule (subject to modification)

1. Introduction: Usability and human aspects in security
2. Common attacks exploiting human vulnerabilities
3. Common evaluation methodologies for usable security
4. Relationship between usability, deployability, and security (UDS) and how to use it in practice
5. Social engineering attacks
6. User study techniques and pitfalls
7. Statistical analysis for usability measurements
8. Example evaluation of authentication in desktop vs mobile devices, browsers, email applications, and private messaging; Defences against social engineering attacks.

Lab Details

N/A

Engineering Tools

N/A

**Details on assessment tools:
See under “Grading Scheme”**

Other information

N/A

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of both the Computer Science and Software Engineering program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating five graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Attribute 1: Knowledge-base for Engineering. This attribute is covered through learning basic concepts in cryptography and security, and how to use these concepts in solving (relatively) small, real-world problems. It will be evaluated by exams and assignments/projects, using the following indicators: Indicator 1.1: Knowledge base of mathematics; and Indicator 1.3: Knowledge- base in a specific domain.

Attribute 2: Problem analysis. This attribute is covered through the analysis of given scenarios to find the right tools and primitives for a practical solution. This will be evaluated by assignments/projects, using the following indicator: Indicator 2.1: Problem identification and formulation.

Attribute 3: Use of Engineering tools. This attribute is covered through the identification and use of appropriate cryptographic libraries and security tools for a given problem. This will be evaluated by assignments/projects, using the following indicators: Indicator 5.1: Ability to use appropriate tools, techniques and resources; Indicator 5.2: Ability to select appropriate tools, techniques, and resources; and Indicator 5.3: Demonstrate awareness of limitations of tools, create and extend tools as necessary.

Attribute 6: Individual and team work. This attribute is covered through the successful completion and delivery of group assignments/projects. The following indicators will be used in evaluation: Indicator 6.1: Cooperation and work ethics; and Indicator 6.2: Contribution: practical/conceptual.

Attribute 10: Ethics and equity. This attribute is covered through the understanding of ethical and social issues relate to computer security and privacy. Current best practices for using security tools and application analysis will be discussed. This attribute will be evaluated by assignments/projects, using the following indicator: Indicator 10.1: Professional ethics and accountability.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following engineering concepts.

1. Understanding of usability and HCI, and how human aspects can improve or harm security
2. Understanding usability evaluation techniques
3. Understanding common attacks exploiting human vulnerabilities for various applications
4. Understanding statistical methods for data analysis in user study
5. Understanding defence techniques against social engineering attacks

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 411 Privacy: Enhancing Technologies, Analysis and
Measurement (3 credits)**

Course Instructor:

Jeremy Clark
j.clark@concordia.ca

Office Hours:

Thursday – 14h00 – EV 9.177

Tutorials: Please see your class schedule for details

Labs: Please see your class schedule for details

Course Calendar Description:

This course is on privacy and related concepts like anonymity, confidentiality, and censorship. The following topics will be covered: hashing, bloom filters, encryption, zero-knowledge proofs, multi-party computation, k-anonymity, differential privacy, trusted execution, separation of duties, digital credentials, onion routing, cookies, privacy-preserving data analytics and machine learning, genomic privacy, financial privacy, and secret ballot voting systems.

Prerequisites: INSE 401

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Comfortable reading and understanding small code snippets in an object-oriented programming language
- Comfortable with basic probability theory
- Knowledge of cryptography may be an asset but is not required

Course materials:

- Required Textbook: None
- Lecture Notes/Slides: available on Moodle
- Additional Reading Material: available on Moodle

Grading Scheme:

1.	Midterm Exam:	30%
2.	Final Exam:	40%
3.	Assignment 1:	10%

- | | | |
|----|---------------|-----|
| 4. | Assignment 2: | 10% |
| 5. | Assignment 3: | 10% |

Midterm Makeup: There will be NO makeup for the midterm. In the case of a serious illness or emergency, the weight of the midterm will be moved towards the final exam. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule:

- Week 1: Introductory concepts, ethical basis, misconceptions
- Week 2: Privacy with cryptography (I)
- Week 3: Privacy with cryptography (II)
- Week 4: Privacy with statistics (I)
- Week 5: Privacy with statistics (II)
- Week 6: Privacy with architecture
- Week 7: Privacy with policy
- Week 8: Midterm review and exam
- Week 9: Anonymity, identity and health privacy
- Week 10: Network and web privacy, censorship
- Week 11: Data, learning, and analytics privacy
- Week 12: Privacy in finance and society

Engineering Tools

- Web developer tools in a standard browser
- Mathematical modelling software like Matlab or Mathematica

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Knowledge base for engineering (Applied)

- KB.2 – Comprehends information and applies concepts in mathematics
- KB.7 - Recalls and defines information, first principles and concepts in specialized engineering science
- KB.8 - Comprehends information and applies concepts in specialized engineering science

Problem analysis (Developed)

- PA.1 - Identifies and formulates complex engineering problems
- PA.3 - Analyzes and solves complex engineering problems
- PA.4 - Critically evaluates the validity and accuracy of solutions

Investigation (Introduced)

IN.1 - Conducts planned activities (literature review, experiments, measurements, laboratories, etc.) and analyzes data
IN.2 - Interprets results and reaches valid conclusions regarding complex engineering problems
IN.4 - Understands and/or demonstrates appropriate safety protocols

Design (Introduced)

DE.1 - Understands the problem (open-ended complex engineering problem) and defines objectives and constraints
DE.2 - Develops a design process considering health and safety risks, applicable standards, economic, environmental, cultural and societal considerations.

Use of engineering tools (Introduced)

ET.1 - Selects and uses tools

Professionalism (Introduced)

PR.1 - Understands the role of engineering profession in society
PR.2 - Understands the responsibility of professional engineer in protection of the public and its interest

Impact of engineering on society and the environment (Developed)

IE.1 - Understands the social, environmental, economic, health, safety, legal and/or cultural aspects of engineering activities

Ethics and equity (Introduced)

EE.3 – Understands and/or resolves ethical issues

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following information systems engineering concepts.

- Define and explain foundational concepts like privacy, differential privacy, anonymity, and anonymity sets.
- Compare and differentiate between several fundamental methods for achieving privacy (cryptography, statistics, hardware architectures, laws and policies)
- Conduct measurements about privacy levels
- Understand and articulate the threat model, adversarial assumptions, and consequences of various types of privacy attacks on real-world systems

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Concordia Institute for Information Systems Engineering
INSE 412: Cybercrime and Digital Forensics

Instructor:	Instructor's Name	instructor@ciise.concordia.ca
POD:	POD Name	pod@encs.concordia.ca

Instructors

Lectures

- S. Instructor (Sec. CC, Mondays, Wednesdays, 18:30–21:00, ROOM123-4)

Office hours

Office hours outside of the class time are by appointment. Contact me in class or by email mokhov@ciise.concordia.ca to set one up.

POD

- P. Od (Sec. CC, Tuesdays, Thursdays, 19:00–21:00)
- P. Od (Sec. CC, Mondays, 21:00–23:00)

Course

Description

This course provides students an introduction to cybercrime, including unauthorized access, mischief to data, possession of hacking tools, possession of child pornography, others; legal aspects: Canadian judicial system, computer crime laws, charter of rights, common law, mutual legal assistance treaty, search warrants, production and assistance orders, international laws; investigation process: search planning, acquisition methods, environment recognition, evidence identification; digital forensics: tools, techniques and procedures; reporting process: investigation and analysis reports, note taking; authority of seizure; forensic interviews; computer crime trials: witness preparation, court sentencing, rebuttal witness, cross-examination, testimony, credibility attacks; and in-depth case studies.

Prerequisites INSE 401, INSE 442

Objectives

The course introduces best practices of the industry along with case studies when confronted with computer crimes. Through a practical assessment, we will analyze in great details the Canadian judicial system and how to successfully be recognized as an expert witness and how to give such

a testimony before the court. We will cover the different steps involved in the making of a search warrant and how to handle the evidence gathered following the search. We will address the prominent methods that are used to conduct computer crime investigations. We will see how to involve different partners in an ongoing investigation as well as using the legal methods in place to move your investigation to an international level. We will also study the techniques used in suspect interviews as well as extracting the maximum information from your witnesses. We will study the needed steps to achieve a full investigation report.

Learning Outcomes

This course aims to give students a good grasp of cybercrime investigations, Canadian computer crime laws, and best practices of the industry, presenting a full investigation report and also properly testifying as an expert witness. By the end of the course, the students will learn about:

- Case studies
- Search warrants
- Court testimony
- Investigation steps
- Interview techniques
- Canadian laws and international laws
- Practical and formal aspects of digital forensic investigation and forensic computing

Graduate Attributes

Graduate Attribute	Indicators	Level of Coverage	Assessment Results Reported
Investigation	<ul style="list-style-type: none"> • Background and hypothesis formulation • Designing experiments • Conduction Experiments and collection of data • Analysis and interpretation of data 	Advanced	Yes
Problem Analysis	<ul style="list-style-type: none"> • Problem Identification and Formulation • Modeling • Analysis 	Advanced	Yes
Knowledge base for engineering	Knowledge base in a specific domain	Intermediate	No
Use of engineering tools	Ability to use appropriate engineering tools and resources	Intermediate	Yes
Individual and team work	<ul style="list-style-type: none"> • Cooperation and work ethics • Contribution • Initiative and leadership • Delivering results 	Intermediate	Yes
Communication Skills	<ul style="list-style-type: none"> • Writing process • Oral presentation 	Advanced	Yes

Concordia Institute for Information Systems Engineering INSE 413 Security Auditing and Compliance (3 credits)

Course Instructor:

Dr. Suryadipta Majumdar
suryadipta.majumdar@concordia.ca
Associate Professor (CIISE)

Office Hours:

TBD

Labs: Please see class schedule for details

Lab Demonstrators: *TBD*

Course Calendar Description:

Security auditing and compliance checking have been a popular security practice to ensure the accountability and transparency of a digital system. With the large-scale emerging technologies (including cloud computing, 5G networking, Internet of Things), the landscape of security auditing is rapidly evolving. This course will prepare students with the knowledge of traditional security auditing techniques, as well as cutting-edge techniques for newer technologies. Topics include the definition of security auditing, review of existing security standards, interpreting security standards, formal verification methods and tools, machine-learning based auditing approaches and current challenges in security auditing.

Prerequisites: INSE 331, INSE 351

Co-requisites: INSE 445

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Strong foundations of operating system, programming, network security, operating system security, and cryptography.

Course materials

Required Textbook: *Insert Name, Author(s), Publisher, Edition, Year*

- Instructor's lecture notes: posted on course webpage
- Research articles and industrial whitepapers: mentioned in the lecture notes

Grading Scheme

Midterm Exam	30%
Project	30%
Lab	10%
Final Exam	30%

1. Midterm Exam: First 6 Lectures. Exam date:
2. Project Report: May be done in group of three to four members. Each student is to research, implement, and write a comprehensive report on the topics that will be provided by the instructor. More details about the project will be posted on the course website. Due date:
3. Lab attendance: Four lab sessions will take place. Lab dates:
4. Final Exam: The exam will take place during the examination period at the end of the semester. Students should not make any specific arrangements to leave the city until the final exam date is posted.

Tentative Course Schedule

- Week 1: Course Overview. Why security auditing and compliance?
- Week 2: Definition of Security Auditing
- Week 3: Introduction to Security Standards
- Week 4: Security Standards for emerging technologies (cloud, IoT, 5G)
- Week 5: Interpreting security standards and challenges
- Week 6: Data collection and processing for security auditing
- Week 7: Midterm Exam
- Week 8: Security policies
- Week 9: Formal Verification - I
- Week 10: Formal Verification - II
- Week 11: Machine learning based approaches
- Week 12: Applying security auditing as a proactive solution

Lab Details

There will be four lab sessions with specific assignments:

Task 1: Automatically interpreting security standards using NLP

Task 2: Setting up a formal verification tool (Sugar) and write security policies in formal language (CSP/SAT) (tool

Task 3: Pre-processing system and network logs for auditing using Logstash

Task 4: Verifying three to five security policies related to system and network security using Sugar

Engineering Tools

Formal verification tools (e.g., Sugar), data processing tools (e.g., Logstash), data-centric dashboards (e.g., OpenSearch)

Details on assessment tools: (This section is optional)

Group Project (3-4 members):

Following the entire auditing procedure for clouds:

- Setting up the environment (e.g., OpenStack, Kubernetes)
- Identifying 15-20 security policies from standards
- Interpreting the policies to translate into formal language
- Conducting data collection from the setup
- Deploying formal verification tools (e.g., Sugar)
- Performing security auditing procedure
- Reporting the auditing results

Useful project resources:

<https://users.encs.concordia.ca/%7Emajumdar/papers/tops18-author.pdf>
<https://users.encs.concordia.ca/%7Emajumdar/papers/ndss17-author.pdf>

Other information

TBD

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

- Understanding the terminologies and language of security standards.
- Interpreting security policies.
- Identifying the requirements of security auditing steps.
- Practicing data analysis tools, formal verification tools, and security auditing dashboard
- Outlining security best practices that potentially prevent imminent security threats

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following <program> engineering concepts.

The student should be able to know the detailed procedure of security auditing (intermediary to advanced).

The student should be well educated on the best practices (intermediary to advanced).

The should be able to write automated tools to conduct security auditing steps including data collection, data processing, policy formulation, policy verification, result interpretation (introductory to advanced).

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Concordia Institute for Information Systems Engineering INSE 441 Mobile Security and Privacy (3 credits)

Professor: Chadi Assi
Professor
Office: EV9.179
Phone: (514) 848-2424 x. 5799
Email: chadi.assi@concordia.ca
Office hours: Wednesdays/Fridays 3:00PM – 4:00PM (or by appointment)

1. Course Description

This course provides a comprehensive exploration of the security challenges and solutions within wireless and mobile communication systems. As mobile devices become ubiquitous and play an integral role in our daily lives, securing the communication channels and data they handle is paramount. The course covers a spectrum of topics ranging from the fundamentals of wireless networks to the intricacies of mobile operating systems and applications.

Prerequisites: INSE 349, INSE 445

2. Course Objectives

By the end of this course, students will understand the fundamentals of wireless and mobile networks, including WLANs and cellular networks. Key challenges, threats, and ethical considerations in wireless and mobile security. Analyse security protocols for Wi-Fi and cellular networks. Security architectures of mobile operating systems (Android and iOS). Students will learn secure development practices and code analysis tools in mobile app development. Mobile device management (MDM) solutions and BYOD policies for effective security. Student will learn to implement security measures for mobile device connectivity, including VPNs. Authentication methods such as biometrics and multi-factor authentication and explore emerging trends like 5G, IoT, and the security challenges they present. Ethical hacking practices and responsible disclosure in wireless and mobile security.

Moodle Course website: All the course materials including lecture slides, exercises, announcements, assignments (description and submission) are posted on moodle site ONLY. Check frequently the website for announcements, course material, assignments, etc.

3. Course Organization

3.1 Lectures and Tutorials

The lectures, tutorials and other relevant materials for INSE 425 will be posted on Moodle.

Topics Covered (Tentative):

1. Introduction to Wireless and Mobile networks (2-3 lectures)
 - WLANs (MAC protocols), Mobility management, Mobile IP, Cellular networks (2G, 3G, 4G/LTE and 5G)
2. Overview of Wireless Security (2 lectures)
 - Key Challenges in Wireless and Mobile Security, Mobile Threats and Attack Vectors, Legal and Ethical Considerations in Wireless and Mobile Security
3. Wireless Networks and Protocols (2 lectures)
 - Wireless Security Protocols (WPA, WPA2, WPA3), Securing Wi-Fi Networks: Best Practices, Cellular Network (e.g., 4G and 5G) Security and Authentication
4. Mobile Operating Systems and Architectures (2 lectures)
 - Android and iOS Security Architecture, Comparison of Mobile OS Security Models, Secure Boot and Trusted Execution Environments, Hardening Mobile OS Configurations
5. Mobile App Security (2 lectures)
 - Secure Mobile App Development Practices Code Analysis and Static/Dynamic Analysis Tools, Data Storage Security in Mobile Apps Secure Communication: SSL/TLS, VPNs
6. Mobile Device Management (MDM) and BYOD (2 lectures)
 - Introduction to MDM Solutions, Implementing and Managing BYOD Policies, Remote Wipe and Device Tracking, Containerization for Mobile Security
7. Network Security for Mobile Devices (2 lectures)
 - Mobile Device Connectivity (Wi-Fi, Cellular), Man-in-the-Middle Attacks on Wireless Networks VPNs and Mobile Security, Secure Mobile Browsing and Web Application Security
8. Mobile Authentication and Authorization
 - Biometric Authentication on Mobile Devices, Multi-Factor Authentication, OAuth and OpenID Connect for Mobile Apps, Mobile Device Permissions and Privacy Settings
9. Emerging Trends and Future Challenges
 - 5G and Its Implications on Mobile Security, Internet of Things (IoT) and Wireless Security Wearables and Embedded Devices Security, Ethical Hacking and Responsible Disclosure in Wireless and Mobile Security

3.2 Textbook (References)

- 1) "Network Security Essentials" by William Stallings", 7th Edition by James
- 2) "Wireless Communication Networks and Systems" by Cory Beard and William Stallings
- 3) "Security Vulnerabilities In Mobile Operating Systems"
- 4) "A Comprehensive Guide to 5G Security"

4. Course Evaluation

Lab assignments + Proj.	30%
Midterm Exam	20%
Final Exam	50%

4.1 Assignments + Project

There will be **three** to **four lab** assignments worth up to 15% of your mark. There will also be a project which is worth 15% of your grade.

Policy on late submissions (these rules will be enforced):

You have totally 8 hours of grace period of any late submission of assignments. Beyond 8 hours: One day delay will result in 20% mark reduction. Two days delay will result in 40% mark reduction. After that, the assignment will not be accepted.

4.2 Midterm Exams

There will be one midterm exam worth 20% of your total grade. The date will be determined in class.

4.3 Final Exam

There will be one final exam that is worth 50% of your total grade. The final exam is scheduled by the University. The date and place will be announced later.

5. Graduate Attributes

This course emphasizes and develops the following CEAB (Canadian Engineering Accreditation Board) graduate attributes and indicators:

Graduate Attribute	Indicator	Level of knowledge	CLO	Evaluation Method
A Knowledge-base for Engineering: Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.	KB-3. Knowledge base in a specific domain (ELEC and COEN)	Advanced	all	Assignments, Midterm and Final exams.
Problem Analysis: An ability to use appropriate knowledge and skills to identify, analyze, and solve complex engineering problems in order to reach substantiated conclusions.	PA-1. Problem identification and formulation PA-2. Modelling PA-3. Problem solving PA-4. Analysis (uncertainty and incomplete knowledge)	Advanced	all	Assignments, Midterm and Final exams

6. Academic Honesty

Violation of the Academic Code of Conduct in any form will be severely dealt with. This includes copying (even with modifications) of program segments. You must demonstrate independent thought through your submitted work.

Click on the following link for more information:

<http://www.concordia.ca/students/academic-integrity.html>

Concordia Institute for Information Systems Engineering **INSE 442 Reverse Engineering, Application and Malware Analysis (3 credits)**

Professor: Chadi Assi
Professor
Office: EV9.179
Phone: (514) 848-2424 x. 5799
Email: chadi.assi@concordia.ca
Office hours: Wednesdays/Fridays 3:00PM – 4:00PM (or by appointment)

1. Course Description

This course will provide an in-depth exploration of reverse engineering techniques and malware analysis methodologies. Students will learn how to analyze and understand the inner workings of software, detect malicious activities, and develop skills to combat evolving cyber threats.

Prerequisites: INSE 331, INSE 351

2. Course Objectives

Reverse engineering is the process of analyzing hardware or software and understanding it, without having access to the source code or design documents. Malicious actors and hackers often are able to reverse engineer systems and exploit what they find in terms of vulnerabilities. On the other hand, the same techniques can be used by good actors to also discover and thwart these threats. This course goes under the hood of reverse engineering for security analysts, security engineers, and system programmers, so they can learn how to use these same processes to stop hackers in their tracks. Further, Malware/Ransomware analysis has become a big business, and their threats can cost a company dearly. When malware breaches a company's cyber defenses, one needs to act quickly to cure current infections and prevent future ones from occurring. In this course students will learn the tools and techniques used by professional analysts. Students will be able to safely analyze, debug, and disassemble any malicious software that comes your way.

3. Course Organization

Moodle Course Website: All the course materials including lecture slides, exercises, announcements, assignments (description and submission) are posted on Moodle site ONLY. Check frequently the website for announcements, course materials, assignments, etc.

3.1 Lectures and Tutorials

The lectures, tutorials and other relevant materials for INSE 442 will be posted on Moodle.

Topics Covered (Tentative):

1. Introduction to Reverse Engineering
 - Definition and principles of reverse engineering
 - Legal and ethical considerations
 - Tools and environments for reverse engineering
2. Assembly Language Fundamentals

- x86 and x64 assembly basics
- Instruction set architecture
- Disassembly and de-compilation techniques
- 3. Static Analysis Techniques
 - File format analysis (PE, ELF, etc.)
 - Code and data identification
 - Binary code analysis with IDA Pro and Radare2
- 4. Dynamic Analysis Techniques
 - Debugging techniques using WinDbg, GDB, or OllyDbg
 - Runtime analysis and monitoring
 - API hooking and code injection
- 5. Malware Analysis Frameworks
 - Introduction to virtual environments such as Cuckoo Sandbox
 - Automated malware analysis techniques
 - Signature-based and behavior-based analysis
- 6. Malware Functionality Analysis
 - Identifying and analyzing malicious behaviors
 - Code obfuscation and anti-analysis techniques
 - Unpacking and decrypting malware payloads
- 7. Memory Forensics
 - Volatility framework usage
 - Analyzing volatile memory dumps
 - Extracting artifacts and indicators of compromise (IoCs)
- 8. Incident Response and Threat Intelligence
 - Integrating malware analysis into incident response
 - Sharing threat intelligence
 - Case studies of real-world malware incidents
- 9. Advanced Topics
 - Rootkit analysis and detection
 - Mobile malware analysis
 - Firmware and hardware reverse engineering
- 10. Hands-On Projects
 - Reverse engineering exercises
 - Malware analysis projects

3.2 Textbook (References)

- 1) [Michael Sikorski](#) , [Andrew Honig](#) “Practical Malware Analysis: The Hands-On Guide to Dissecting Malicious Software ” 2012
- 2) [Eldad Eilam](#) “Reversing: Secrets of Reverse Engineering” April 15, 2005
- 3) [Bruce Dang](#) , [Alexandre Gazet](#) , [Elias Bachaalany](#) , [Sébastien Josse](#) “Practical Reverse Engineering: x86, x64, ARM, Windows Kernel, Reversing Tools, and Obfuscation” Feb, 2014

4. Course Evaluation

Lab assignments + Proj.	40%
Midterm Exam	20%
Final Exam	40%

4.1 Assignments + Project (tentative)

There will be **three to four lab** assignments worth up to 20% of your mark. There will also be a project which is worth 20% of your grade.

Policy on late submissions (these rules will be enforced):

You have totally 8 hours of grace period of any late submission of assignments. Beyond 8 hours: One day delay will result in 20% mark reduction. Two days delay will result in 40% mark reduction. After that, the assignment will not be accepted.

4.2 Midterm Exams

There will be one midterm exam worth 20% of your total grade. The date will be determined in class.

4.3 Final Exam

There will be one final exam that is worth 40% of your total grade. The final exam is scheduled by the University. The date and place will be announced later.

5. Graduate Attributes

This course emphasizes and develops the following CEAB (Canadian Engineering Accreditation Board) graduate attributes and indicators:

Graduate Attribute	Indicator	Level of knowledge	CLO	Evaluation Method
A Knowledge-base for Engineering: Demonstrated competence in university level mathematics, natural sciences, engineering fundamentals, and specialized engineering knowledge appropriate to the program.	KB-3. Knowledge base in a specific domain (ELEC and COEN)	Advanced	all	Assignments, Midterm and Final exams.
Problem Analysis: An ability to use appropriate knowledge and skills to identify, analyze, and solve complex engineering problems in order to reach substantiated conclusions.	PA-1. Problem identification and formulation PA-2. Modelling PA-3. Problem solving	Advanced	all	Assignments, Midterm and Final exams

	PA-4. Analysis (uncertainty and incomplete knowledge)			
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6. Academic Honesty

Violation of the Academic Code of Conduct in any form will be severely dealt with. This includes copying (even with modifications) of program segments. You must demonstrate independent thought through your submitted work.

Click on the following link for more information:

<http://www.concordia.ca/students/academic-integrity.html>

Concordia Institute for Information Systems Engineering
INSE 445 Network Security (3 credits)

Course Instructor:

TBD

TBD@concordia.ca**Office Hours:** *TBD***Tutorials:** See the class schedule for details**Labs:** N/A**Course Calendar Description:**

This course will provide students a comprehensive understanding of network security essentials. The covered topics of this course include secure data transmission, web security, domain name system (DNS) protection, wireless network security, denial-of-service (DoS) attacks and mitigation, intrusion detection systems, firewalls, and security for advanced network architectures.

Component(s): Lecture 3 hours per week; Tutorial 1 hours per week.

Prerequisites: INSE 321, INSE 349; COEN 366 or ELEC 366 or COMP 445**Specific Knowledge and Skills Needed for this Course:**

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Communication networks and protocols
- Cryptography
- Programming

Course materials**Required Textbook:**

Cryptography and Network Security: Principles and Practice, Global 8th Edition by William Stallings, Pearson Publishing 2020

Grading Scheme		
Assignments	30%	
Midterm	20%	
Tutorials	10%	
Final Exam	40%	
Tentative Course Schedule		
Topics		Week
Introduction of the course		1
Computer network security concepts		2
Cryptography for network security		3
Public key infrastructure & key management		4
Network security protocols		5
Network vulnerabilities and web security		6
Wireless network security		7
Domain name service security		8
Denial of service attacks and mitigation		9
Access control and user authentication		10
Intrusion detection systems and firewalls		11
Next generation networks security		12
Lab Details		
N/A		
Engineering Tools		
N/A		
Details on assessment tools:		
See under “graduate attributes”		
Other information		
N/A		
Graduate Attributes:		
The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.		
Graduate Attribute	Indicators	Level of Coverage
A knowledge base for engineering	Knowledgebase in a specific domain	Intermediate
Problem analysis	Analysis; Problem solving	Intermediate
Design	Design a secure network; Implement a secure network architecture design	
Use of engineering tools	Ability to use appropriate engineering tools and resources	Introductory

Life-long learning	Identify and address educational needs in a changing world	Introductory
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Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following cybersecurity concepts.

Course Learning Outcomes	Related Graduate Attributes
Learn fundamental knowledge in network security	Knowledgebase in a specific domain
Analyze the need of a secure network design and implement such a design conceptually	Analysis; Problem Solving; Design a secure network; Implement a secure network architecture design; Ability to use appropriate engineering tools and resources
Explore the recent technology development in network security	Identify and address educational needs in a changing world

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 452 Penetration Testing and Ethical Hacking (3 credits)**

Course Instructor:

TBD

TBD@concordia.ca**Office Hours:** *TBD***Tutorials:** N/A**Labs:** Please see your class schedule for details**Course Calendar Description:**

Throughout this course, students will develop a comprehensive understanding of cyber attack and defense strategies. The covered topics of this course include system vulnerabilities and exploitation, hacking strategies, cyber attack tools, cybercrime acts, hacking ethics, and malware.

Component(s): Lecture 3 hours per week; lab 1 hours per week.

Prerequisites: INSE 442, INSE 445**Specific Knowledge and Skills Needed for this Course:**

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Fundamental cybersecurity
- Operating systems (Linux and Windows)
- Programming

Course materials

Required Textbook: Hands on Hacking: Become an Expert at Next Gen Penetration Testing and Purple Teaming by Matthew Hickey and Jennifer Arcuri, Wiley 2020

Grading Scheme

Assignments	20%
Labs	30%
Midterm	20%
Final Exam	30%

Tentative Course Schedule

Topics	Week
Introduction to Ethical Hacking and Pentesting	1
Cybersecurity Laws and Hacking Ethics	2
System Vulnerabilities and Hacking Strategies	3
Metasploit + Lab 1 (Metasploit lab)	4
System Hacking + lab 2 (Vulnerability exploitation)	5
Denial of Service and Social Engineering	6
Web Hacking + lab 3 (Web hacking)	7
Evading IDS, Firewalls, and Honeypots + lab 4 (Firewall evasion)	8
Hacking Wireless Networks and Mobile Platforms	9
IoT and Cloud Hacking + lab 5 (IoT hacking)	10
Malware Threats + lab 6 (malware lab)	11
Pentest report writing	12

Lab Details

6 labs are required. See course schedule for details

Engineering Tools

Metasploit; Virtual machines

Details on assessment tools:**Other information:****Graduate Attributes:**

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Graduate Attribute	Indicators	Level of Coverage
A knowledge base for engineering	Knowledgebase in a specific domain	Advanced
Problem analysis	Problem Identification; Analysis; Problem solving	Intermediate
Investigation	Conduct a series of experiments to identify the problem; Analysis and interpretation of data	Intermediate

Use of engineering tools	Ability to use appropriate engineering tools and resources; Ability to select	Intermediate
	appropriate tools, techniques, and resources	
Ethics and equity	Professional ethics and accountability	Intermediate
Professionalism	Responsibility of the role; Protection of the public	Intermediate
Communication skills	Pentest report writing	Intermediate

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following cybersecurity concepts.

Course Learning Outcomes	Related Graduate Attributes
Learn fundamental knowledge in penetrations testing and ethical hacking	Knowledgebase in a specific domain
Master some pentesting tools and learn how to use them to conduct hacking	Ability to use appropriate engineering tools and resources; Ability to select appropriate tools, techniques, and resources
Learn how to strategically conduct pentests to identify vulnerabilities and write a report on the results	Conduct a series of experiments to identify the problem; Analysis and interpretation of data; Problem Identification; Analysis; Problem solving; Pentest report writing
Learn what is professionalism in pentesting	Professional ethics and accountability; Responsibility of the role; Protection of the public

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 481 Blockchain Technologies and Applications (3 credits)**

Course Instructor:

Jeremy Clark
j.clark@concordia.ca

Office Hours:

Thursday – 14h00 – EV 9.177

Tutorials: Please see your class schedule for details

Labs: Please see your class schedule for details

Course Calendar Description:

This course deals with Bitcoin and blockchain technologies, and includes topics such as: digital cash, hash functions, digital signatures, Merkle trees, linked time-stamping, blockchains, Bitcoin, Ethereum, smart contracts, and Solidity FinTech.

Prerequisites: *N/A*

Co-requisites: *N/A*

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Comfortable reading and understanding small code snippets in an object-oriented programming language
- Comfortable coding short programs in an object-oriented programming language
- Knowledge of cryptography may be an asset but is not required

Course materials

Required Textbook: Narayanan et al., Bitcoin and Cryptocurrency Technologies, Princeton University Press (2016)

Grading Scheme:

1. Midterm Exam:	30%
2. Final Exam:	40%
3. Assignment 1:	10%
4. Assignment 2:	10%
5. Assignment 3:	10%

Midterm Makeup: There will be NO makeup for the midterm. In the case of a serious illness or emergency, the weight of the midterm will be moved towards the final exam. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule

Week 1: Course overview
Week 2: Crypto I: Hash functions
Week 3: Crypto II: Digital signatures
Week 4: Crypto III: Commitments, accumulators, proof of work, time-stamping
Week 5: Blockchain: Consensus and sybil-resistance
Week 6: Bitcoin I: Details.
Week 7: Bitcoin II: Details.
Week 8: Midterm (in class).
Week 9: Ethereum I: Details.
Week 10: Ethereum II: Programming smart contracts, Solidity.
Week 11: Applications to finance
Week 12: Extensions to base technology

Engineering Tools

Developer software and tools: Students may benefit from learning how to use various developer tools such as Remix, Truffle, Ganache, and VS Code (or VSCodium).

Programming languages: Students will need to learn how to use programming languages such as Solidity for developing secure smart contracts.

Web3 interfaces: Students will need to learn to use wallet software, such as MetaMask, and may benefit from learning web3 development.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Knowledge base for engineering (Applied/Advance)

- KB.1 - Recalls and defines information and concepts in mathematics
- KB.2 – Comprehends information and applies concepts in mathematics
- KB.7 - Recalls and defines information, first principles and concepts in specialized engineering science
- KB.8 - Comprehends information and applies concepts in specialized engineering science

Problem analysis (Developed/Intermediate)

- PA.1 - Identifies and formulates complex engineering problems
- PA.2 - Develops models from first principles to analyze complex engineering problems
- PA.3 - Analyzes and solves complex engineering problems
- PA.4 - Critically evaluates the validity and accuracy of solutions

Investigation (Introduced/Introductory)

IN.1 - Conducts planned activities (literature review, experiments, measurements, laboratories, etc.) and analyzes data

Design (Introduced/Introductory)

DE.1 - Understands the problem (open-ended complex engineering problem) and defines objectives and constraints

Use of engineering tools (Developed/Intermediate)

ET.1 - Selects and uses tools

Communication skills (Introduced/Introductory)

CS.1 - Understands, interprets and/or assesses oral, written, graphical or visual communications

CS.2 - Produces written engineering reports and design documentation

Impact of engineering on society and the environment (Introduced/Introductory)

IE.1 - Understands the social, environmental, economic, health, safety, legal and/or cultural aspects of engineering activities

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following information systems engineering concepts.

- Define and explain the fundamental cryptographic building blocks that compose to allow Nakamoto consensus and the blockchain data structure.
- Develop, implement, and deploy a smart contract to live blockchain network such as Ethereum's current testnet.
- Conduct measurements about blockchain transactions, consumption of gas and other fees, data size of contracts and transactions, and trace transactions through block explorer tools.
- Understand and articulate the threat model, adversarial assumptions, and consequences of various types of security attacks on a blockchain system.
- Communicate effectively about security vulnerabilities in smart contracts whether at the level of the code, the functionality of the contract, the composition of multiple contracts or the incentives governing participants.
- Think creatively about blockchain use-cases and articulate when blockchains provide useful properties relative to simpler alternatives like a centralized database.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

Course number	Course Title	Term
INSE 482	Industrial Control Systems and Critical Infrastructure Security	

Course Instructor	Office	E-Mail	Office Hours
Walter Lucia	EV 9.185	walter.lucia@concordia.ca	

CLASS, LAB, AND TUTORIAL SCHEDULE					
Section	Day	Time	Location	Instructor	E-mail
Lecture					
Tutorial					
Tutorial					
Labs					Lab Start Date
Lab A					
Lab B					
Lab C					
Lab D					
Lab E					

COURSE CALENDAR DESCRIPTION
<p>This introductory course provides fundamental notions of feedback control systems and cyber-physical systems (CPSs) and how such systems are used to control critical industrial control systems and infrastructures. Students will learn the basics of how to reproduce feedback and networked control systems in a simulation environment and how to analyze their performance. The potential vulnerability of autonomous critical infrastructure to cyber-attacks is explored, and classes of attacks affecting the security and privacy of such systems are investigated. Students will learn how to emulate the presence of attacks in a simulation environment with the aim of testing their impact on control systems and critical infrastructures. Passive and active mechanisms for the detection and mitigation of cyber-attacks are investigated, and the concept of secure and resilient control is introduced. An introduction to the engineering software Matlab/Simulink will be provided, with particular emphasis on how such tools can be used to design cyber-secure industrial control systems for critical infrastructures.</p>

PREREQUISITES

TEXTBOOK AND ADDITIONAL COURSE MATERIALS

- Suggested textbook(s):
 - Rajeev Alur (2023). Principles of Cyber-Physical Systems, MIT Press Bookstore, ISBN 9780262548922

- Instructor's lecture notes: provided on Moodle.
- Software Use: Matlab

KNOWLEDGE BASE FOR ENGINEERING PREREQUISITES

GRADING POLICY

Evaluation Tool	Weight
Midterm	35
Assignments	15
Tutorials	15
Final Exam	35
Total	100

Passing Criteria:

- If your total score before the final exam is less than 30% and you decide to defer the final exam, you will receive an **R** grade which prevents you to defer the final exam.
- In order to pass the class, both your cumulative score and the final examination must be above 50%.

GRADUATE ATTRIBUTES: SKILLS TO LEARN AND/OR UTILIZE

Graduate Attribute	Indicators
Problem analysis	Problem identification and formulation (Intermediate)
	Modelling (Intermediate)
	Problem solving (Intermediate)
	Analysis (Intermediate)
Investigation	Background and hypothesis formulation (Intermediate)
	Designing experiments and collection of data (Intermediate)
	Analysis and interpretation of data (Intermediate)
Use of engineering tools	Ability to use appropriate tools, techniques, and resources (Intermediate)
	Demonstrate awareness of limitations of tools, create and extend tools as necessary (Intermediate)

COURSE LEARNING OUTCOMES (CLOS)

By the end of this course students will be able to:

Course Learning Outcome	Relationship to Graduate Attributes
-------------------------	-------------------------------------

A. Model critical infrastructures as feedback control systems/cyber-physical systems	Problem analysis Modelling
B. Determine the stability and performance of control systems	Problem analysis Problem identification and formulation Analysis Investigation Background and hypothesis formulation
C. Assess the class of cyber-attacks that could affect networked cyber-physical systems and their impact	Problem analysis Problem identification and formulation Investigation Background and hypothesis formulation
D. Reproduce in a simulation environment cyber-physical system and the presence/effect of cyber-attacks	Use of engineering tools Modelling Investigation Designing experiments and collection of data Analysis and interpretation of data Use of engineering tools Ability to use appropriate tools, techniques, and resources Demonstrate awareness of limitations of tools, create and extend tools as necessary
E. Design basic anomaly detector and mitigation strategies against cyber-attacks for industrial control systems	Problem analysis Problem Solving Design Analysis (uncertainty and incomplete knowledge) Investigation Analysis and interpretation of data Use of engineering tools Ability to use appropriate tools, techniques, and resources. Demonstrate awareness of limitations of tools, create and extend tools as necessary.

TENTATIVE COURSE OUTLINE	
Topics	Week

Introduction to feedback control systems	1
Introduction to networked control systems and cyber-physical systems	2
Industrial control systems modeling and control systems for critical infrastructure	3
Mathematical modeling of critical infrastructures as cyber-physical systems	4
Basic design principles for control systems and performance criteria	5
Security and privacy concepts for automated critical infrastructures	6
Classes of cyber-attack potentially targeting control systems and critical infrastructures	7
Modelling and representation of cyber-physical systems and cyber-attacks in simulation environment using Matlab/Simulink	8
Control system performance analysis under cyber-attacks	9
Design criteria to ensure safety and security of cyber-physical systems against cyber-attacks	10
Introduction to the design of anomaly detectors for industrial control systems	11
Introduction to the design of resilient control solutions against cyber-attacks	12

**Concordia Institute for Information Systems Engineering
INSE 483 IoT and Embedded System Security (3 credits)**

Course Instructor: Mohsen Ghafouri (Ghafouri@encs.concordia.ca)

Office Hours:

Wednesdays, from 11:30 AM to 1:30 PM
EV building room 3.117

Tutorials: Please see your class schedule for details

Tutors: *insert tutor name(s)*

Labs: Please see your class schedule for details

Lab Demonstrators: *insert name(s)*

Course Calendar Description:

This course initially provides an introduction to the concept of security and its basic definitions, proceeding with the concept of embedded systems, their application and characteristics. Then, it delves into the famous attacks, lessons learned, and common vulnerabilities and attack in general, and in cases of different domains, such as industrial control systems. We will describe the details inside embedded systems, such as their IO, operating system, communication, etc. Finally, we provide security analysis frameworks and monitoring techniques.

Prerequisites: N/A

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Fundamentals of security and definitions, specification and application of IoT devices and embedded systems, foundations for cyber-physical systems. Embedded HW architectures, sensors, actuators, processors, IO and peripherals, memory architectures, interfacing memory and peripheral, embedded system testing, and operating systems.

Course materials

Required Textbook: *Insert Name, Author(s), Publisher, Edition, Year*

- 1- Giancarlo Fortino, Carlos E. Palau, Antonio Guerrieri, Nora Cuppens, Frédéric Cuppens, Hakima Chaouchi, Alban Gabillon, “Interoperability, Safety and Security in IoT” Publisher: Springer International Publishing, Year: 2018
- 2- Shancang Li and Li Da Xu “Securing the Internet of Things” Syngress , Year: 2017
- 3- Catherine H. Gebotys “Security in Embedded Devices” Springer US, Year: 2010
- 4- Bovino, C., Morandi, M. (2015). IoT and embedded systems security. Switzerland: Scuola universitaria professionale della Svizzera italiana.

Grading Scheme

The weight distribution may subject to changes upon notice.

- Midterm: 25%
- Assignment: 30%
- Final exam: 45%

In order to pass the class, both your cumulative score and the final examination must be above 50%

Tentative Course Schedule

Insert course schedule here

1. Introduction to security
2. Introduction to embedded systems
3. Embedded system applications
4. Risk and steps to ensure embedded system security
5. Cryptography and safety tests
6. Examples of security in embedded systems
7. Internal structure of embedded systems
8. midterm
9. Input and outputs, security and privacy concerns
10. Operating systems
11. Embedded systems and networks
12. Detection and mitigation of threats
13. Best practices to avoid security concerns

Lab Details

You may include a list of lab trainings and names of experiments here.

NA

Engineering Tools

Insert engineering tools introduced/utilized in the course here.

Microprocessors, programming

Details on assessment tools:

The course includes 4 assignments each has 10% of the total grades. It

Other information

Any form of cheating, plagiarism, personation, and falsification of a document as well as any other form of dishonest behaviour related to the obtention of academic gain or the avoidance of evaluative exercises committed by a student is an academic offence under the Academic Code of Conduct and may lead to severe penalties up to and including suspension and expulsion.

As examples only, you are not permitted to:

- Copy from anywhere without indicating where it came from
- Let another student copy your work and then submit it as his/her own
- Hand in the same assignment in more than one class
- Have unauthorized material or devices in an exam. Note that you do not have to be caught using them – just having them is an offence

- Copy from someone's else exam
- Communicate with another student during an exam
- Add/remove pages from an examination booklet or take the booklet out of an exam room
- Acquire exam or assignment answers or questions
- Write an exam for someone else or have someone write an exam for you
- Submit false documents such as medical notes or student records
- Falsify data or research results

You are subject to the Academic Code of Conduct. Take the time to learn more at:
<http://provost.concordia.ca/academicintegrity/>

Students are expected to attend every class. Some material may only be covered in class and not made available on the course website. Students are expected to read the assigned material and to actively participate in class discussions.

- Students are expected to be respectful of other people's opinions and to express their own views in a calm and reasonable way. Disruptive behaviour will not be tolerated.
- Students are expected to be familiar with the Code of Rights and Responsibilities:
<http://rights.concordia.ca>

- Concordia Counselling and Development offers career services, psychological services, student learning services, etc.

<http://cdev.concordia.ca>

- The Concordia Library Citation and Cycle Guides:

<http://library.concordia.ca/help/howto/citations.html>

- Advocacy and Support Services:

<http://supportservices.concordia.ca>

- Student Transition Centre:

<http://stc.concordia.ca>

- New Student Program:

<http://newstudent.concordia.ca>

- Office for Students with Disabilities:

<http://supportservices.concordia.ca/disabilities>

- The Academic Integrity Website:

<http://provost.concordia.ca/academicintegrity>

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

Insert graduate attributes here

Graduate attribute	Indicator	Level of knowledge
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KB - A knowledge base for engineering	<ul style="list-style-type: none"> • Knowledge base in a specific domain 	Advanced
UET - Use of engineering tools	<ul style="list-style-type: none"> • Ability to use appropriate tools, techniques and resources • Demonstrate awareness of limitations of tools, create and extend tools as necessary 	Intermediate
DE – Design	<ul style="list-style-type: none"> • Define the objective • Idea generation and selection • Detailed design • Validation and implementation 	Intermediate
CO- Communication Skills	<ul style="list-style-type: none"> • Documentation 	Intermediate
PA-Problem analysis	<ul style="list-style-type: none"> • Problem Identification and Formulation • Problem Solving • Analysis 	Intermediate

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following <program> engineering concepts.

Upon completion of this course, students will have gained a thorough understanding of embedded systems, their security aspects, and how these security elements influence different applications. Additionally, they will be equipped to apply this knowledge in a practical project setting. The course curriculum includes the following topics:

- Fundamental concepts of cyber security, including key terms and definitions.
- The significance of security in embedded systems, with relevant examples.
- Security testing in embedded systems, including hazard identification and risk assessment.
- Overview of notable cyber attacks and common entry points for attackers.
- The role of processors and computing within embedded systems.
- Issues related to connections, security, and timing in embedded systems.
- Various communication channels and their mediums in embedded systems.
- Examination of a realistic cyber attack scenario.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 484 Quantum Computing and Security (3 credits)**

Course Instructor:

Amr Youssef
amr.youssef@concordia.ca

Office Hours:

Monday 10:0 am-11:30 am

Tutorials: Please see your class schedule for details

Tutors: TBA

Labs: N/A

Course Calendar Description:

This course covers quantum mechanics (photon polarization, linear polarization, circular and elliptical polarization, general quantum variables, composite systems, measuring a subsystem, other incomplete measurements); quantum cryptography (the Bennett-Brassard protocol, the no-cloning theorem, quantum teleportation); error-correcting codes (linear codes, syndrome decoding); error correction for quantum key distribution, privacy amplification, quantum computing (quantum gates, the Deutsch Algorithm, universal set of quantum gates); Shor's algorithm (finding the period of $f(x)$, estimating the probability of success, efficiency of factoring); post quantum cryptography.

Prerequisites: N/A

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics:
Linear Algebra, Basic Number Theory

Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Specific knowledge and skills:

N/A

Course materials

Optional Textbooks:

Nielsen, Michael A., and Isaac L. Chuang. Quantum computation and quantum information. Cambridge university press, 2010.

Vidick, Thomas, and Stephanie Wehner. Introduction to quantum cryptography. Cambridge University Press, 2023.

Grading Scheme

50%: Final exam
25%: Midterm exam
10%: Assignments
15%: Project

Late Assignments: Late assignments suffer a penalty rate of 20% per day, up to 5 days (weekends count).

Midterm Makeup: There will be NO makeup for the midterm exam. In the case of a serious illness or emergency, the weight of midterm will be moved towards final. Be prepared to provide written documentation (e.g., a medical excuse from your doctor) to verify the emergency and its seriousness.

Tentative Course Schedule

Week 1-3: Introduction to Quantum Mechanics (Photon Polarization, Linear polarization, Circular and elliptical polarization, General Quantum Variables, Composite Systems, Measuring a Subsystem, Other Incomplete Measurements)

Week 4-5: Quantum Cryptography (The Bennett–Brassard Protocol, The No-Cloning Theorem, Quantum Teleportation)

Week 6: Introduction to Error-Correcting Codes (Linear Codes, Syndrome Decoding)

Week 7: Error Correction for Quantum Key Distribution, Privacy Amplification

Week 8: Quantum Computing (Quantum Gates, The Deutsch Algorithm, Universal Set of Quantum Gates)

Week 9-10: Number Theory for Shor's Algorithm, Finding the Period of $f(x)$, Estimating the Probability of Success, Efficiency of Factoring

Week 11-12: Post Quantum Cryptography

Lab Details

N/A

Engineering Tools

Qskit (Quantum Information Science Kit): Qiskit is an open-source quantum computing SDK developed by IBM. It allows users to write quantum algorithms using Python and run them on IBM's quantum processors or simulators.

<https://qiskit.org>

Details on assessment tools:

Project description: All proposed projects must include a practical implementation component. Projects based solely on paper surveys will not be accepted

Other information

N/A

Graduate Attributes:

While there are currently no Graduate Attributes for Cybersecurity Engineering undergraduate programs in Canada, the following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

As part of the Cybersecurity Engineering Undergraduate program curriculum, the content of this course includes material and exercises related to the teaching and evaluation of graduate attributes. Graduate attributes are skills that have been identified by the Canadian Engineering Accreditation Board (CEAB) and the Canadian Information Processing Society (CIPS) as being central to the formation of Engineers, computer scientists and information technology professionals. As such, the accreditation criteria for the Software Engineering and Computer Science programs dictate that graduate attributes are taught and evaluated as part of the courses. This particular course aims at teaching and evaluating the following graduate attributes. The following is a description of these attributes, along with a description of how these attributes will be incorporated in the course. This part may be updated later.

Attribute 1: Knowledge-base for Engineering. This attribute is covered through learning basic concepts in Quantum Computing, and how to use these concepts in solving the Integer Factorization problem. It will be evaluated by exams and assignments/ projects, using the following indicators: Indicator 1.1: Knowledge base of mathematics; and Indicator 1.3: Knowledge- base in a specific domain.

Attribute 2: Problem analysis. This attribute is covered through the analysis of given scenarios to find the right tools and primitives for a practical solution. This will be evaluated by assignments/projects, using the following indicator: Indicator 2.1: Problem identification and formulation.

Attribute 3: Use of Engineering tools. This attribute is covered through the identification and use of Qskit (Quantum Information Science Kit) and appropriate post quantum cryptography libraries for a given problem. This will be evaluated by assignments/projects, using the following indicators: Indicator 5.1: Ability to use appropriate tools, techniques and resources; Indicator 5.2: Ability to select appropriate tools, techniques, and resources; and Indicator 5.3: Demonstrate awareness of limitations of tools, create and extend tools as necessary.

Attribute 6: Individual and teamwork. This attribute is covered through the successful completion and delivery of group assignments/projects. The following indicators will be used in evaluation: Indicator 6.1: Cooperation and work ethics; and Indicator 6.2: Contribution: practical/conceptual.

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to achieve the following:

1. Understand core principles in quantum mechanics, covering topics like photon polarization and measuring subsystems.
2. Gain basic proficiency in quantum cryptography, including the Bennett–Brassard Protocol, the No-Cloning Theorem, and Quantum Teleportation.
Quantum Computing Basics
3. Develop a working knowledge of quantum computing essentials, such as quantum gates, the Deutsch Algorithm, and the universal set of quantum gates.
4. Apply theoretical concepts to practical problem-solving, especially in error correction for quantum key distribution, and collaborate effectively in implementing quantum algorithms and cryptographic protocols.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 485 Cybersecurity of Healthcare Systems and Devices (3 credits)**

Course Instructor:

instructor
instructor@ciise.concordia.ca

Office Hours:

Insert office hours Days – Time – Location here

Course Calendar Description:

This course offers an in-depth look into the unique challenges and methodologies associated with securing healthcare systems and devices. It covers a range of topics including the architecture of healthcare IT systems, data privacy laws, the security of medical devices, and strategies to mitigate cybersecurity threats in healthcare. This course combines theoretical learning with practical case studies to prepare students for careers in healthcare cybersecurity.

Course Objectives:

- *Understand the structure and vulnerabilities of healthcare IT systems.*
- *Develop strategies for securing medical devices and electronic health records.*
- *Analyze case studies on healthcare cybersecurity breaches and learn from them.*
- *Familiarize with laws and regulations governing data privacy in healthcare.*

Prerequisites: N/A

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Below is a list of useful knowledge topics that students should have familiarity before enrolling. The following topics provide a foundational understanding necessary for comprehending the course material effectively. (1) Basic Principles of Cybersecurity: Understanding of fundamental cybersecurity concepts such as confidentiality, integrity, and availability (CIA triad). Familiarity with common types of cyber threats (e.g., malware, phishing, ransomware) and basic defensive measures; (2) Fundamentals of Networking: Knowledge of network architecture, including the roles of routers, switches, and other networking devices, is beneficial. Additionally, familiarity with network protocols (e.g., TCP/IP) and common network services (e.g., DNS, HTTP/S) are helpful; (3) Information Systems and Data Protection: Understanding of information systems and the importance of protecting data, especially personal and sensitive information. Basic knowledge of data encryption techniques and secure data storage practices.

Course materials

Required Textbook: *Insert Name, Author(s), Publisher, Edition, Year*

Course Materials:

1. A. Wirth, C. Gates, J. Smith, "Medical Device Cybersecurity for Engineers and Manufacturers," Norwood, MA Artech House, 2020.
2. L. Ayala, "Cybersecurity for Hospitals and Healthcare Facilities," Berkeley, CA. 2016.
3. M.S. Obaidat, I. Traore, I. Woungang, "Biometric-based Physical and Cybersecurity Systems," Springer International Publishing, 2019.
4. L. Coventry, D. Branley, "Cybersecurity in Healthcare: A Narrative Review of Trends, Threats and Ways Forward," *Maturitas*, vol. 1, no. 13, pp. 113:48-52, 2018.
5. C.S. Kruse, B. Frederick, T. Jacobson, D.K. Monticone, "Cybersecurity in Healthcare: A Systematic Review of Modern Threats and Trends," *Technology and Health Care*, vol. 25, no. 1, 2017.
6. S. Gerke, T. Minssen, G. Cohen, "Ethical and Legal Challenges of Artificial Intelligence-Driven Healthcare," *Artificial Intelligence in Healthcare*, pp. 295-336, 2020.
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9. A.J. Coronado, T.L. Wong, "Healthcare Cybersecurity Risk Management: Keys to an Effective Plan," *Biomedical Instrumentation & Technology*, pp. 26-30, 2014.
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Grading Scheme

- Midterm Exam (20%)
- Group Project (40%): Analysis and presentation of a recent cybersecurity incident in healthcare.
- Final Exam (40%)

Tentative Course Schedule

- Week 1: Introduction to Healthcare IT Systems
- Week 2: Data Privacy and Security Laws (HIPAA, GDPR, etc.)
- Week 3: Cybersecurity Threats to Healthcare Systems
- Week 4: Security of Medical Devices
- Week 5: Healthcare Cybersecurity Risk Management and Mitigation Strategies
- Week 6: Security of Artificial Intelligence-Driven Healthcare
- Week 7: Cyber Attack Modeling, Detection, and Mitigation
- Week 8: Biometric-based Cybersecurity Systems,
- Week 9: Cybersecurity of the Internet of Medical Things
- Week 10: Incident Response and Disaster Recovery in Healthcare
- Week 11: Emerging Trends in Healthcare Cybersecurity
- Week 12: Case Studies of Healthcare Cybersecurity Breaches

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

<i>Graduate Attribute</i>	<i>Indicators</i>	<i>Level of Coverage</i>	<i>Assessment Results Reported</i>
<i>Investigation</i>	<ul style="list-style-type: none"> • <i>Background and hypothesis formulation</i> • <i>Designing experiments</i> • <i>Conduction Experiments and collection of data</i> • <i>Analysis and interpretation of data</i> 	<i>Advanced</i>	<i>Yes</i>
<i>Problem Analysis</i>	<ul style="list-style-type: none"> • <i>Problem Identification and Formulation</i> • <i>Modeling</i> • <i>Analysis</i> 	<i>Advanced</i>	<i>Yes</i>
<i>Knowledge base for engineering</i>	<i>Knowledge base in a specific domain</i>	<i>Intermediate</i>	<i>Yes</i>
<i>Use of engineering tools</i>	<i>Ability to use appropriate engineering tools and resources</i>	<i>Intermediate</i>	<i>Yes</i>
<i>Individual and team work</i>	<ul style="list-style-type: none"> • <i>Cooperation and work ethics</i> • <i>Contribution</i> • <i>Initiative and leadership</i> • <i>Delivering results</i> 	<i>Advanced</i>	<i>Yes</i>

<i>Communication Skills</i>	<ul style="list-style-type: none"> • <i>Writing process</i> • <i>Oral presentation</i> 	<i>Advanced</i>	<i>Yes</i>
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Course Learning Outcomes (CLOs):

By the end of this course, students will:

- *Have a comprehensive understanding of cybersecurity principles as they apply to healthcare systems and devices.*
- *Be able to identify and assess potential security threats in healthcare IT environments.*
- *Understand the legal and ethical implications of data security in healthcare.*
- *Be equipped to contribute to the development and implementation of cybersecurity measures in healthcare settings.*

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University \(https://www.concordia.ca/campus-life/safety/general-safety.html\)](https://www.concordia.ca/campus-life/safety/general-safety.html)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 486 Cybersecurity Management and Governance (3 credits)**

Course Instructor:

Serguei Mokhov

Insert e-mail address here

[You may include more information about the course instructor.](#)

Office Hours:

Insert office hours Days – Time – Location here

Course Calendar Description:

This course covers topics of cybersecurity management, governance and best practices in small, medium and large organizations of various types (public, private, non-profit, startup). This includes cybersecurity and privacy policies and compliance; authentication authorization, and access control; backups; audits; monitoring and penetration testing; scheduled maintenance and patching; secure and agile software development (security by design), deployment, configuration, and maintenance; reporting responsible disclosure of breaches and vulnerabilities; incident management and response; cybersecurity organization structure; cybersecurity education (anti-phishing, ransomware) and communications; technological and legal frameworks; and government cybersecurity laws and regulations in Quebec, Canada, and world-wide.

Prerequisites: N/A

Co-requisites: N/A

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

Insert specific knowledge and skills here:

- *Policies, laws, regulations, and compliance requirements*
- *Risk assessment*
- *Insider threats*
- *Advanced persistent threats and threat landscape*
- *Managing cybersecurity best practices in an organization*
- *Maintenance cycles and updates of software, hardware*
- *Supporting cybersecurity decision making*
- *Managing incidents and incident response*
- *Secure software development by design best practices*
- *Organization's members education and training in prevention of cyberthreats*
- *Mitigation of vulnerabilities*
- *Responsible disclosure*

Course materials**Required Textbook:** N/A

- *Introduction to Cybersecurity Governance for Business Technology Management, Marc-André Léger*
- *Cybersecurity Governance, CISA.gov*
- *NIST*
- *Canadian and Quebec Government Frameworks*
- *TBD*

Grading Scheme

- *20% midterm quiz*
- *30% final quiz*
- *50% project*

Students must pass 50% on each component to pass the course.

Tentative Course Schedule

Week	Tentative topic
1	Course introduction Introduction to cybersecurity governance Selection of project teams
2	Government laws, regulations; Compliance; Legal frameworks
3	Identifying and securing digital assets; Risk assessment and management; Monitoring
4	Monthly maintenance and patch management; auditing
5	Secure software development by design; including agile
6	Midterm quiz
7	Mid-term break
8	Organizational cybersecurity structure; end user an executive education
9	Incident detection and response; responsible disclosure and reporting
10	Advanced persistent threats and their mitigation; phishing; ransomware
11	Final quiz
12	Project presentations

Details on assessment tools:

Quizzes will assess the students grasp on the materials covered; no memorization will be required; case analysis.

Projects will cover surveys on the course topics or in-depth case studies from one or more organizations and their cybersecurity management and governance.

Other information

Industry practitioners will be invited to give guest lectures on the topics of the course; subject to availability.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the term.

<i>Graduate Attribute</i>	<i>Indicators</i>
<i>Problem analysis</i>	<ul style="list-style-type: none"> ● <i>Problem identification and formulation (intermediate)</i> ● <i>Analysis (intermediate)</i> ● <i>Problem solving (intermediate)</i>
<i>Design</i>	<ul style="list-style-type: none"> ● <i>Define the objective (intermediate)</i> ● <i>Validation and implementation (intermediate)</i>
<i>Individual and team work</i>	<ul style="list-style-type: none"> ● <i>Cooperation and work ethics (intermediate)</i> ● <i>Initiative and leadership (intermediate)</i> ● <i>Delivering results (intermediate)</i>
<i>Communications skills</i>	<ul style="list-style-type: none"> ● <i>Writing process (intermediate)</i> ● <i>Oral presentation (advanced)</i>
<i>Professionalism</i>	<ul style="list-style-type: none"> ● <i>TBD</i>
<i>Economics and project management</i>	<ul style="list-style-type: none"> ● <i>TBD</i>
<i>Life-long learning</i>	<ul style="list-style-type: none"> ● <i>Identifying missing knowledge and learning opportunities (intermediate)</i>

Course Learning Outcomes (CLOs):

By the end of this semester, students are expected to master the following **Cybersecurity Program's** engineering concepts.

<i>Course Learning Outcome</i>	<i>Relationship to Graduate Attributes</i>
<i>Identify core digital assets and devise their protection strategies</i>	<ul style="list-style-type: none"> ● <i>Problem identification and formulation</i> ● <i>Analysis</i>
<i>Devise or update an organization policy in the current cybersecurity threat landscape</i>	<ul style="list-style-type: none"> ● <i>Writing process</i> ● <i>Oral presentation</i>
<i>Enforce compliance</i>	<ul style="list-style-type: none"> ● <i>Cooperation and work ethics</i> ● <i>Initiative and leadership</i> ● <i>Delivering results</i>
<i>Plan employee training</i>	<ul style="list-style-type: none"> ● <i>Initiative and leadership</i> ● <i>Life-long learning</i>
<i>Assess risks and attack surface</i>	<ul style="list-style-type: none"> ● <i>Problem identification and formulation</i> ● <i>Analysis</i>
<i>Implement best cybersecurity practices for software systems deployment and maintenance</i>	<ul style="list-style-type: none"> ● <i>Delivering results</i>
<i>Implement a policy for secure by design software development and maintenance</i>	<ul style="list-style-type: none"> ● <i>Define the objective</i> ● <i>Validation and implementation</i>
<i>Regularly review local and global government regulations wrt security, privacy, and compliance</i>	<ul style="list-style-type: none"> ● <i>Initiative and leadership</i> ● <i>Life-long learning</i>
<i>Devise backup and retention strategies</i>	<ul style="list-style-type: none"> ● <i>Define the objective</i> ● <i>Validation and implementation</i>
<i>Have checklists in place for detection, response, disclosure and reporting of cybersecurity incidents</i>	<ul style="list-style-type: none"> ● <i>Define the objective (intermediate)</i> ● <i>Validation and implementation</i>

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University](https://www.concordia.ca/campus-life/safety/general-safety.html)

(<https://www.concordia.ca/campus-life/safety/general-safety.html>)

[If your course has additional information about health and safety guidelines/training, please insert them here.](#)

On Campus Resources

Please visit [Student services at Concordia University](#) for the services available to Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 490 Capstone Cybersecurity Engineering Design Project (6 credits)**

Course Instructor:

TBDs

[TBDs]@concordia.ca

Office Hours:

TBD

Tutorials: N/A.

Labs: Please see your class schedule for details

Course Calendar Description:

Students work in groups to design, implement and/or validate solutions to a complex interdisciplinary cybersecurity problem, typically involving vulnerabilities, threats, and/or defenses of a security-critical system in a sandbox environment or simulated-use case. Each team will demonstrate the project and prepare adequate demonstration and documentation. The project also fosters teamwork between group members and allows students to develop project management, technical writing, and technical presentation skills.

Component(s): Tutorial: 1 hour/week, two terms. Laboratory-equivalent time: 3 hours/week, two terms.

Notes: Students will work in groups under the direct supervision of a faculty member.

Prerequisites: ENGR 301, ENGR 391; INSE 390

Students must complete 75 credits in the program prior to enrolling.

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the following topics. Should you have difficulties in any of these topics, you are strongly encouraged to review them before the DNE deadline.

- Programming
- Computer architecture and operating systems
- Communication networks and protocols
- Baseline security controls (access control, cryptography, firewalls, etc.)
- Vulnerability assessment and threat modeling
- Security operations and incident handling
- Technical writing and reporting

Course materials

- **Required textbook:** N/A
- **Suggested textbook:** To be determined based on the specific projects available each term.
- **Instructor’s lecture notes:** Will be posted on the Moodle course site.
- **Lab manual:** To be determined based on the specific projects available each term.
- **Software use:** To be determined based on the specific projects available each term.

Grading Scheme

Assessment Tool	Weight
Project selection and planning <ul style="list-style-type: none"> • Group formation • Faculty supervisors • Industry partners and the support letter (if any) 	10%
Detailed project proposal <ul style="list-style-type: none"> • Objective • Potential application areas • Potential customers • Current or potential competitors • Product main features/functionalities, desired dimensions • Partners (potential vendors, research centers) 	10%
Detailed project design <ul style="list-style-type: none"> • Alternative solutions • Evaluation of alternatives • Candidate solution that best serves the objectives 	20%
Preliminary solutions <ul style="list-style-type: none"> • Prototype demonstration and/or simulations Evaluation of design with respect to its impact on: <ul style="list-style-type: none"> • Society and environment • Professional practice and legal issues Evaluation of design with respect to: <ul style="list-style-type: none"> • Ethics and equity 	20%
Final project report and presentations <ul style="list-style-type: none"> • A working prototype of the best alternative • Detailed documentation of the final prototype/product and its performance • Evaluation of the project based on its compliance with design objectives • Dissemination cost (for software) and/or manufacturing cost (for hardware) • Entrepreneurship opportunities • Potential customers and investors • Potential funding sources • IP and patent issues • Competition • Life-cycle analysis 	40%

Tentative Course Schedule

The following are based on a 12-week semester schedule, each with 2 weeks of final exams.

Weeks 1-14 are in the Fall term, and Weeks 15-28 are in the Winter term. The final product presentation may be scheduled before the finals period to be consistent with the rest of the capstone projects.

Milestones	Weeks
Phase 1: Project Proposal	1-5
Group Formation and Project Selection	1
Project Proposal Development	2-4
Proposal Report	4
Proposal Presentation	5
Phase 2: Project Design	6-14
Project Design Development	6-11
Design Report	11
Design Presentation	12
Final Design Approval	14
Phase 3: Prototype Development	15-18
First Prototype Development	15-18
First Prototype Demonstration	18
Phase 4: Final Product	18-28
Final Prototype Development	18-25
Final Prototype Demonstration	25
Final Product Presentation (Oral/Poster)	27
Final Product Report	28

Lab Details: To be determined based on the specific projects available in a given term.

Engineering Tools: To be determined based on the specific projects available in a given term.

Graduate Attributes:

The following is the list of graduate attributes (skills) that students use, learn and/or apply throughout the two terms.

Graduate Attribute	Indicators	Level of Coverage
A knowledge base for engineering	<ul style="list-style-type: none"> • Knowledge base in specific domain 	Advanced
Problem Analysis	<ul style="list-style-type: none"> • Problem identification and formulation • Modeling • Problem solving • Analysis 	Advanced
Investigation	<ul style="list-style-type: none"> • Background and hypothesis formulation • Designing experiments • Conduction experiments and collection of data • Analysis and interpretation of data 	Advanced
Design	<ul style="list-style-type: none"> • Define objective 	Advanced

	<ul style="list-style-type: none"> • Idea generation and selection • Detailed design • Validation and implementation 	
Use of engineering tools	<ul style="list-style-type: none"> • Ability to use appropriate engineering tools and resources • Ability to select appropriate tools, techniques, and resources 	Advanced
Individual and teamwork	<ul style="list-style-type: none"> • Cooperation and work ethics • Contribution: practical/conceptual • Initiative and leadership • Delivering results 	Advanced
Communication Skills	<ul style="list-style-type: none"> • Writing process • Information gathering • Documentation • Oral presentation 	Advanced
Professionalism	<ul style="list-style-type: none"> • Role and responsibilities of professional engineers • Professional practice 	Advanced
Impact of engineering on society & the environment	<ul style="list-style-type: none"> • Awareness of society and environment impact • Sustainability in design 	Advanced
Ethics and equity	<ul style="list-style-type: none"> • Professional ethics and accountability • Equity 	Advanced
Economics and project management	<ul style="list-style-type: none"> • Fundamentals of economics • Economics evaluation of projects • Project planning and implementation 	Advanced
Life-long learning	<ul style="list-style-type: none"> • Identifying missing knowledge and learning opportunities • Continuous improvement and self-learning 	Advanced

Course Learning Outcomes (CLOs):

By the end of this semester, successful students can expect to acquire the following skills:

Course Learning Outcome	Related Graduate Attributes
Collect, develop, and specify requirements for a security control or application based on analyses of potential vulnerabilities and exploits.	<ul style="list-style-type: none"> • Knowledge base in a specific domain • Background and hypothesis formulation • Problem identification and formulation • Modeling • Problem solving • Analysis
Design an effective solution/procedure to prevent, detect, and/or mitigate a cyber threat, with an appropriate mix of software and possibly hardware components using	<ul style="list-style-type: none"> • Define objective • Idea generation and selection • Detailed design • Validation and implementation Designing experiments

modern cybersecurity techniques, skills, software, libraries, APIs and/or tools.	<ul style="list-style-type: none"> • Conduction experiments and collection of data • Analysis and interpretation of data • Ability to use appropriate engineering tools and resources • Ability to select appropriate tools, techniques, and resources
Identify and apply appropriate incident handling and security hardening to reduce cyber security risks and respond to security incidents and events.	<ul style="list-style-type: none"> • Ability to use appropriate engineering tools and resources • Ability to select appropriate tools, techniques, and resources • Fundamentals of economics • Economics evaluation of projects • Project planning and implementation
Work effectively as part of a team. Make significant contributions to the team's work.	<ul style="list-style-type: none"> • Cooperation and work ethics • Initiative and leadership • Project planning and implementation
Communicate in speaking and writing to develop cyber threat intelligence and collaborate with a broader community of stakeholders to improve baseline security across an ecosystem.	<ul style="list-style-type: none"> • Contribution: practical/conceptual • Writing process • Information gathering • Documentation • Oral presentation • Delivering results • Awareness of society and environment impact • Sustainability in design • Identifying missing knowledge and learning opportunities
Recognize professional responsibilities and make informed judgments in cybersecurity practice based on legal and ethical practices.	<ul style="list-style-type: none"> • Role and responsibilities of professional engineers • Professional practice • Professional ethics and accountability • Equity • Continuous improvement and self-learning

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at: [Safety Programs - Concordia University](#)

On Campus Resources

Please visit [Student Services at Concordia University](#) for the services available to Gina Cody School students.

**Concordia Institute for Information Systems Engineering
INSE 498 Topics in Cybersecurity Engineering (3 credits)**

Course Instructor:

TBD
[TBD]@concordia.ca

Office Hours:

TBD

Tutorials: N/A

Labs: N/A

Course Calendar Description:

These courses may be offered in a given year upon the authorization of CIISE. When offered, they will cover concepts, theories, and practical knowledge on topics in cybersecurity engineering that will complement elective courses in cybersecurity engineering in a given year.

Component(s): Lecture 3 hours per week

Prerequisites: Permission of the Department is required.

Specific Knowledge and Skills Needed for this Course:

Students taking this course are expected to have sufficient knowledge of the topic offered in a given year. The specific knowledge and skills needed will be determined and announced based on the offered topic.

Course materials

- **Required textbook:** A textbook is usually not required, though it is to be determined by the course instructor based on the specific topic offered in a given term.
- **Suggested textbook:** To be determined based on the specific topic being offered in a given term.
- **Instructor's lecture notes:** Will be posted on Moodle course management site.
- **Lab manual:** To be determined based on the specific topic offered in a given term.
- **Software use:** To be determined based on the specific topic offered in a given term.

Grading Scheme

The following is a reference grading scheme for the course, which may be finalized by the course instructor according to the specific topic being offered in a given year.

Assessment Tool	Weight
Assignments	25%
Course project	40%
Final exam	30%
Class participation	5%

Passing Criteria:

To be determined based on the specific topic being offered in a given term.

Tentative Course Schedule

To be determined based on the specific topic offered in a given term.

Lab Details

To be determined based on the specific topic offered in a given term.

Engineering Tools

To be determined based on the specific topic offered in a given term.

Details on assessment tools

To be determined based on the specific topic offered in a given term.

Other information

To be determined based on the specific topic offered in a given term.

Graduate Attributes

The graduate attributes, indicators, and the reporting of assessment results will be specified by the course instructor. The levels of coverage shall be intermediate or advanced, which will be determined by the course instructor offering the specific topic.

Course Learning Outcomes (CLOs):

By the end of this semester, successful students can expect to acquire cybersecurity skills that will complement those in other electives offered in a given year. The CLOs and corresponding GAs will be specified by faculty members offering the chosen topic in a given term.

Health and Safety Guidelines

All health and safety rules specific to this course can be found in the lab manual. General health and safety instructions and available health and safety trainings can be found at:

[Safety Programs - Concordia University](#)

On Campus Resources

Please visit [Student Services at Concordia University](#) for the services available to Gina Cody School students.

Appendix 3a: Graduate attribute mapping (B.Sc. in Cybersecurity)

Graduate attribute mapping for **Demonstrate knowledge.**

Competently apply knowledge in a) software engineering, b) algorithms and data structures, c) systems software, d) computer elements and architectures, e) theoretical foundations of computing, f) discrete mathematics and g) probability and statistics.							
		Rubrics		Level			
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method
Knowledge in cybersecurity fundamentals (elements: software engineering, algorithms and data structures, systems software, computer elements and architectures, theoretical foundations of computing)	<ul style="list-style-type: none"> Recall solution techniques from software engineering, science, and mathematics Identify the appropriate approach to solve domain-specific problems Combine methods to solve complex problems Exhibit deep knowledge of cybersecurity fundamentals 	A	Capable of expressing real problems using knowledge from the element and prior learning	COMP 228 COMP 248 INSE 351	COMP 228 COMP 249 COMP 346 COMP 352 INSE 221 INSE 412 INSE 485	COMP 348 COMP 352 COMP 445 INSE 321 INSE 411 INSE 441 INSE 452 INSE 481 INSE 483	Project work Assignments Written examinations Case studies
		B	Capable of expressing the most important aspects of real problems in the element, while simplifying or neglecting some aspects				
		C	Some difficulty to express and/or solve problems and to leverage prior knowledge				
		F	Capable of expressing or solving only the simplest problems in the element				
Knowledge in mathematics (elements: discrete mathematics, probability and statistics)	<ul style="list-style-type: none"> Mathematically model complex problems Identify appropriate techniques to solve mathematical problems Show detailed understanding of mathematical concepts and how they are applied in cybersecurity. 	A	Identifies and applies appropriate techniques for solving the problem in specific context	COMP 232 ENGR 213 ENGR 233 Math elective	ENGR 245 INSE 221	INSE 321 INSE 411 ENGR 371 ENGR 391 INSE 481	Project work Assignments Written examinations Case studies
		B	Identifies approaches for solving the problem, and some of which apply within a specific context.				
		C	Identifies and approach that is only partly applicable for the context				
		F	Does not identify or apply the correct approaches to mathematical problems				

Graduate attribute mapping for **Analyse and solve problems.**

Use appropriate knowledge and skills, including background research and experimentation, to identify, investigate, abstract, conceptualize, analyse, and solve complex computing problems, in order to reach substantiated conclusions.							
Indicators	Students can..	Rubrics		Level			Suggested assessment method
		Grade	Definition	Introduce	Develop	Apply	
Problem identification and formulation	<ul style="list-style-type: none"> • Demonstrate a good understanding of the problem. • Demonstrate confidence in answering questions: What information is given? What more information do you need? • Demonstrates the capability of identifying unknowns and ambiguities (assumptions). • Describe in general terms what a solution would look like. 	A	Demonstrates understanding of how various pieces of the problem relate to each other and the whole. Identifies multiple approaches for solving the problem that apply within a specific context.	COMP 232 ENGR 213 ENGR 233 ENGR 245 INSE 351	COMP 346 COMP 348 INSE 221 INSE 452 INSE 481 INSE 482 INSE 483 INSE 486	COMP 352 INSE 321 INSE 411 INSE 412 INSE 441 INSE 442 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Demonstrates some understanding of how various pieces of the problem relate to each other and the whole. Identifies multiple approaches for solving the problem, only some of which apply within a specific context.				
		C	Demonstrates minimal understanding of how various pieces of the problem relate to each other and the whole. Identifies only a single approach for solving the problem that does apply within a specific context.				
		F	Demonstrates no understanding of how various pieces of the problem relate to each other and the whole. Identifies one or more approaches for solving the problem that do not apply within a specific context.				
Modelling	<ul style="list-style-type: none"> • Extract parameters and variables from problem statement (look for essence of the problem). • Demonstrate the capability of making valid assumptions. • Use logic (deduction) to formulate model from assumptions. • Demonstrate ability to identify limitations, possible extensions. • Compare modelling strategies: Logical-mathematical models versus physical models. 	A	Demonstrates the ability to construct a clear and insightful problem statement with evidence of all relevant contextual factors.	ENGR 213 ENGR 245 INSE 351	COMP 346 COMP 445 ENGR 233 INSE 481 INSE 482		Project work Assignments Written examinations Case studies
		B	Demonstrates the ability to construct a clear and insightful problem statement with evidence of most relevant contextual factors.				
		C	Begins to demonstrate the ability to construct a problem statement with evidence of most relevant contextual factors, but problem statement is superficial.				
		F	Demonstrates a limited ability in identifying a problem statement or related contextual factors.				
Problem solving	<ul style="list-style-type: none"> • Make educated guesses and verify. • Consider a special case. • Generalize the problem. • Use mathematical tools. • Use computer programs and computer simulation. 	A	Not only develops a logical, consistent plan to solve problem, but recognizes consequences of solution and can articulate reason for choosing solution.	COMP 232 ENGR 213 ENGR 245 INSE 351	ENGR 233 INSE 452 INSE 481 INSE 482 INSE 483 INSE 486	COMP 352 INSE 411 INSE 441 INSE 442 INSE 490	Project work Assignments Written examinations Case studies
		B	Having selected from among alternative, develops a logical, consistent plan to solve the problem.				
		C	Considers and rejects less acceptable approaches to solving problem.				
		F	Only a single approach is considered and is used to solve the problem.				
Analysis (uncertainty and incomplete knowledge)	<ul style="list-style-type: none"> • Simplify model (remove unnecessary details). • Identify similar problems. • Split problem into sub-parts. • Identify elements of uncertainty. • Derive new facts. 	A	Organizes and synthesizes evidence to reveal insightful patterns, differences, or similarities related to focus.	COMP 228 INSE 351	COMP 352 INSE 452 INSE 481 INSE 482 INSE 483 INSE 486	COMP 352 INSE 411 INSE 412 INSE 441 INS E442 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Organizes evidence to reveal important patterns, differences, or similarities related to focus.				
		C	Organizes evidence, but the organization is not effective in revealing important patterns, differences, or similarities.				
		F	Lists evidence, but it is not organized and/or is unrelated to focus.				
Background and hypothesis formulation	<ul style="list-style-type: none"> • Describe the setting for the investigation (Why are we doing it? What are we expecting?) • Consider whether it has been done before and how it relates to theory/other information (hypothesis may not be necessary, could be just measurement) 	A	Capable of defining all the fundamentals and formulating the hypothesis related to given engineering problem.	ENGR 371 INSE 411	INSE 482	INSE 412 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Capable of defining 80% of the fundamentals and formulating the hypothesis related to given engineering problem with minor flaws.				
		C	Capable of defining 50% of the fundamentals and formulating the hypothesis related to given engineering problem with sufficient flaws.				
		F	Not able to comprehend the engineering problem and establish a reasonable test hypothesis.				
Designing experiments	<ul style="list-style-type: none"> • Identify random sample • Avoid bias • Design a controlled experiment (not all experiments are controllable – how do you deal with this?) • Choose instruments and testing method • Consider limitations of equipment • Demonstrate understanding of concepts of reproducibility, accuracy, feasibility, cost, size 	A	Objective is clear, controllable factors are well defined. Experimental set-up is accurate. Data collection scheme and data analysis methodologies are appropriate. All the safety measures are considered.	ENGR 371 INSE 411 INSE 481	INSE 482	INSE 412 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Objective is clear, controllable factors are defined but has minor flaws. Experimental set-up is accurate. Data collection scheme and data analysis methodologies are addressed well but include some inconsistencies. Safety measures are considered.				
		C	Objective is defined but not clear, selection of controllable factors are not well justified. Experimental set-up has flaws. The methodology proposed for data collection and analysis is not accurate.				

	<ul style="list-style-type: none"> • Discuss issue of materials versus measurements • Discuss difficulty of duplication 	F	Objective is not clear. Controllable factors are not defined or has major flaws. Proposed methodologies for data collection and analysis are wrong.				
Conducting experiments and collection of data	<ul style="list-style-type: none"> • Demonstrate knowledge of the tools (related to Use of Engineering Tools attribute) • Consider variability/operator error • Discuss random sampling • Report all data objectively • Discuss safety issues • Discuss ethical issues including obtaining appropriate permissions if experiments involve humans 	A	Excellent understanding of a random sampling and applies this when analyzing the experiment. Suggests good measures to either change experiment or address the issues on the collected data.	ENGR 371 INSE 411 INSE 481	INSE 452 INSE 482	INSE 412 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Excellent understanding of a random sampling and applies this when analyzing the experiment. Suggests good measures to either change experiment or address the issues on the collected data				
		C	Some significant flaws but displays an adequate understanding of the issues.				
		F	Some basic misunderstanding of the issues				
Analysis and interpretation of data	<ul style="list-style-type: none"> • Use methods from probability and statistics to analyze and interpret data • Match experimental results with theory • Validate assumptions • Discuss what went wrong/error analysis • Synthesize information to arrive at substantiated conclusions 	A	Demonstrates a very strong ability to interpret problem statements, stating semi-formal expectations through use of cases, domain models and operation contracts and providing solutions (how to) through high- and low-level designs as well as planning for implementation. Demonstration of responsibility. Ability to trace requirements to implementation (and vice versa).	ENGR 371 INSE 411 INSE 481	INSE 452 INSE 482	INSE 412 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Demonstrates good ability to interpret problem statements, stating intentions (use cases and domain model) and translating them to design/implementation through class interaction.				
		C	Demonstrates an average ability to interpret specifications and translate them to interaction diagrams and/or to code, but no full support on analysis and design.				
		F	Demonstrates little ability to interpret specifications and translate them to interaction diagrams and/or to code, and no full support on analysis and design.				

Graduate attribute mapping for **Design software and systems.**

Design and evaluate solutions for complex open-ended computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, as well as economic, cultural, societal, and environmental

Indicators	Students can..	Rubrics		Level			Suggested assessment method
		Grade	Definition	Introduce	Develop	Apply	
Define the Objective	<ul style="list-style-type: none"> Consult client and ask questions Gather information and describe the problem Gather information on prior solutions Find out about social and environmental needs Define the objective of the corporate (owner of the design) 	A	Identify key issues in the design that will impact the client. Can describe the needs of the client beyond what they say they want. Readily gathers relevant information and develop elegant models to apply to their design.	COMP 228 INSE 351 INSE 411 INSE 481	COMP 346 COMP 445 INSE 483 INSE 486	INSE 490	Project work Assignments Written examinations Case studies
		B	Can identify the needs of the client in the design. Shows how these needs have guided the design. Can articulate the needs of the client related to the need being addressed by the current project. May include extraneous information, but ultimately find correct ones and develop model(s) to apply to their designs.				
		C	Can identify what the client says they want in the design. Can identify few needs of the customer relative to the design. Has difficulty deciding what information to use, but may develop a close to correct model to apply to their design.				
		F	Cannot identify how the needs of the client relate to the design of the current project. Cannot identify relevant information or develop models to apply to their design.				
Idea generation and selection	<ul style="list-style-type: none"> Critique alternative solutions Create new, unique, untried solutions Demonstrate thinking outside the box Generate many possible diverse solutions, followed by a rational process of selection Use techniques to help evaluate different solutions with a good argument (e.g., brainstorm, lateral thinking, and for selection (e.g., decision grids, force-field analysis) 	A	Extends a novel or unique idea, question, format, or product to create new knowledge or knowledge that crosses boundaries. Thoroughly analyzes different solutions and carefully evaluates the relevance of contexts when presenting an argument.	COMP 352 INSE 351 INSE 411	COMP 346 INSE 483	INSE 490	Project work Assignments Written examinations Case studies
		B	Creates a novel or unique idea, question, format, or product. Identifies own and others' assumptions and several relevant contexts when presenting a position. Identifies different solutions and evaluates the relevance of contexts when presenting an argument.				
		C	Experiments with creating a novel or unique idea, question, format, or product. Identifies limited solutions and evaluates the relevance of contexts when presenting an argument.				
		F	Reformulates a collection of available ideas. Shows awareness of different solutions. Begins to identify some contexts when presenting an argument.				
Detailed Design	Describe a complex solution that allows implementation	A	Reviews a number of reasonable alternatives before finalizing design decisions. Initiates appropriate design iterations. Excellent cost estimates. Design principles applied appropriately and without error.	COMP 249 INSE 351 INSE 411	COMP 346 COMP 352 COMP 445 INSE 483	INSE 490	Project work Assignments Written examinations Case studies
		B	Identifies some alternative approaches before finalizing design decisions. Occasionally initiates design iterations, or done with prompting. Provides reasonable cost estimates. Applies design principles appropriately to achieve reasonable solution.				
		C	Few if any alternative approaches explored for design decisions. Serious deficiencies in iterating through the design process. Reasonable cost estimates. Uses design principles but with serious errors.				
		F	Does not consider alternatives when making design decisions. No appropriate iterations in the design process considered. No review of prior work. Sound design principles are not used or used incorrectly. No cost estimates.				
Validation and Implementation	Validate design against specs (does it meet all requirements, e.g., cost, efficiency, codes, etc.?)	A	Design meets or exceeds requirements and constraints. Insightful evaluation supports conclusions and recommendations.	COMP 228 COMP 248 INSE 351 INSE 411	COMP 249 COMP 346 COMP 352 COMP 445 INSE 483 INSE 486	INSE 490	Project work Assignments Written examinations Case studies
		B	Design meets requirements and constraints with moderately effective use of resources. Sound evaluation of design supports conclusions.				
		C	Design barely meets requirements and constraints. Evaluation of design incomplete or partially erroneous.				
		F	Design does not meet requirements and constraints. No evaluation of design done or done incorrectly.				

Graduate attribute mapping for Use appropriate resources.

Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of their strengths and limitations.

Indicators	Students can..	Rubrics		Level			Suggested assessment method
		Grade	Definition	Introduce	Develop	Apply	
Ability to select appropriate tools, techniques, and resources	<ul style="list-style-type: none"> • evaluate suitability of the tools for the task. • In labs, choose the right tools/techniques for problem. • In projects, demonstrate ability to select appropriate tools and techniques. 	A	Defends assumptions and approximations made.	INSE 351 INSE 411	INSE 221 INSE 452 INSE 481	INSE 321 INSE 490	Project work Assignments Written examinations Case studies
		B	Selects and applies appropriate quantitative model to solve problems, using reasonable approximations and assumptions.				
		C	Selects model but some errors and inappropriate assumptions.				
		F	Does not select model, or selected model is inappropriate.				
Ability to use appropriate tools, techniques and resources	<ul style="list-style-type: none"> • Demonstrate individual use of tools (to be assessed in labs and assignments). 	A	Successfully performs experiments and correctly documents all required results.	COMP 228	COMP 228	COMP 348 INSE 321 INSE 490	Project work Assignments Written examinations Case studies
		B	Successfully performs experiments and correctly documents some of the results.	COMP 248	COMP 249		
		C	Makes a few errors in the experiments leading to errors.	INSE 411	COMP 346		
		F	Unable to perform the experiments.	INSE 445	COMP 352		
Demonstrate awareness of limitations of tools, create and extend tools as necessary	<ul style="list-style-type: none"> • Demonstrate awareness of limitations of tools used. • Address limitations of given tools by extending tools and combining tools. • Address limitations of given tools by creating new tools. • Address limitations of given tools by choosing different tools. • Create small software tools. 	A	Shows excellent understanding of the system operating procedures, accuracy of the sensors and limitations of the experiment in the analysis and discussion of the experimental results.		INSE 221 INSE 482 INSE 483	INSE 321	Project work Assignments Written examinations Case studies
		B	Shows good understanding of how the system works. Considers and takes into account the experimental errors.				
		C	Can reasonably operate the system. Shows satisfactory understanding of major experimental errors.				
		F	Lacks understanding of the system operation. Does not analyze experimental results in light of accuracy of data or experimental limitations.				

Graduate attribute mapping for Communicate Effectively.

Communicate with the computing community and with society at large about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

Indicators	Students can..	Rubrics		Level			Suggested assessment method
		Grade	Definition	Introduce	Develop	Apply	
Writing Process	<ul style="list-style-type: none"> Identify audience needs, interests and level of knowledge Frame supportable, significant theses and arguments Develop appropriate expository and argumentative strategies Identify and utilize relevant, high-quality resources Create drafts and revisions Respond to critical feedback 	A	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer.	ENCS 282 INSE 481	INSE 452 INSE 486	INSE 412 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.				
		C	Uses appropriate and relevant content to develop and explore ideas through most of the work.				
		F	Uses appropriate and relevant content to develop simple ideas in some parts of the work.				
Information Gathering	<ul style="list-style-type: none"> Articulate research questions Formulate research plans and data collection strategies Develop effective use of databases, library resources Evaluate quality and usefulness of sources Maintain complete and accurate records of sources used 	A	Synthesizes in-depth information from relevant sources representing various points of view/approaches.	ENCS 282 INSE 481		INSE 490	Project work Assignments Written examinations Case studies
		B	Presents in-depth information from relevant sources representing various points of view/approaches.				
		C	Presents information from relevant sources representing limited points of view/approaches.				
		F	Presents information from irrelevant sources representing limited points of view/approaches.				
Documentation	<ul style="list-style-type: none"> Choose correct genre and format Organize information appropriately for readers' use Identify and utilize correct citation format Differentiate between correct source usage and plagiarism 	A	Has exemplary ability to use information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution and demonstrate a full understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.	COMP 248 INSE 481	ENCS 282 INSE 483	INSE 490	Project work Assignments Written examinations Case studies
		B	Has proficient ability to use information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution and demonstrate some understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.				
		C	Has developing ability to use information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution and demonstrate minimal understanding of the ethical and legal restrictions on the use of published, confidential, and/or proprietary information.				
Oral Presentation	<ul style="list-style-type: none"> Demonstrate understanding of cognitive and conceptual differences between oral and written presentation Create appropriate scope for treatment of topic in oral presentation Adapt written text to oral presentation Identify audience needs, interests and level of knowledge Plan, design and effectively utilize visual materials Utilize effective presentation techniques Identify strategies to overcome linguistic difference Adapt presentation to heterogeneous audiences 	A	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Delivery techniques make the presentation compelling, and speaker appears polished and confident. A variety of types of supporting materials make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.	ENCS 282 INSE 481		INSE 412 INSE 485 INSE 486 INSE 490	Project work Assignments Written examinations Case studies
		B	Language choices are thoughtful and generally support the effectiveness of the presentation. Delivery techniques make the presentation interesting, and speaker appears comfortable. Supporting materials make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.				
		C	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Delivery techniques make the presentation understandable, and speaker appears tentative. Supporting materials make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/authority on the topic.				
		F	Language choices are unclear and minimally support the effectiveness of the presentation. Delivery techniques detract from the understandability of the presentation, and speaker appears uncomfortable. Insufficient supporting materials make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.				

Graduate attribute mapping for **Work Individually and in a Team.**

Work effectively as an individual and as a member or leader in diverse teams and in multi-disciplinary settings.

		Rubrics		Level			
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method
Cooperation and Work Ethics	<ul style="list-style-type: none"> Actively participate in meetings Communicate within the group Co-operate within the group Assist teammates when needed Volunteer for tasks Respect teammates 	A	Actively participates in team meetings; assists the team members when needed; respects the team members and their ideas; displays a positive attitude within the team; respects the deadlines; respects the commitments and is co-operative with other team members.	ENGR 213	INSE 221 INSE 412 INSE 486	INSE 321 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Participates in team meetings; assists the team members; respects the team members; respects the deadlines; co-operative with other team members.				
		C	Tries to participate in the team meetings; assists the team members a few times; respects the deadlines; is generally respectful to other team members and their ideas.				
		F	Does not attend the team meetings regularly; does not communicate with other team members; disrespectful to other team members; does not meet the deadlines.				
Contribution: practical/conceptual	<ul style="list-style-type: none"> Research and gather information Ensure the quality of individual contribution Suggest ideas Write reports or section of reports Provide constructive feedback on the report(s) or presentations Contribute to the presentation 	A	Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive, and advances the project. Proactively helps other team members complete their assigned tasks to a similar level of excellence. Helps the team move forward by articulating the merits of alternative ideas or proposals.	COMP 228	INSE 221 INSE 412	INSE 321 INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive, and advances the project. Offers alternative solutions or courses of action that build on the ideas of others.				
		C	Completes all assigned tasks by deadline; work accomplished advances the project. Offers new suggestions to advance the work of the group.				
		F	The ideas and work provided do not advance the work of the group.				
Initiative and Leadership	<ul style="list-style-type: none"> Conceptual contribution as measured by peer evaluation Demonstrates leadership and initiative Supports shared leadership? 	A	Takes initiative to do most of the activities of the project; voluntarily takes the leadership of the team; organizes the meetings; respects other team members and their ideas; volunteers to do the project presentation; manages any kind of conflicts within the group.		INSE 412 INSE 486	INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Takes initiative to do different activities of the project; voluntarily takes the leadership of the project team; organizes the meetings; respects other team members and their ideas; tries to manage any kind of conflicts within the group.				
		C	Takes initiative to do some of the activities of the project; upon discussion with the group, takes the leadership of the project team; organizes most of the meetings; usually respects other team members and their ideas; tries to manage any kind of conflicts within the group.				
		F	Does not take initiative to do the activities of the project; does not have the leadership skill; is sometimes not respectful to other team members and their ideas; does not volunteer to do the project presentation; cannot manage conflicts within the group.				
Delivering Results	<ul style="list-style-type: none"> Has the group delivered the expected results in a timely manner? Will the group members work together on a new project in the future? 	A	Delivers an extemporaneous presentation, with clearly defined objectives, an easy-to- follow structure, and a simple straightforward presentation style. Responds to questions with confidence and ease. The presentation respects the time specifications.	COMP 228	INSE 486	INSE 485 INSE 490	Project work Assignments Written examinations Case studies
		B	Delivers a presentation that may or may not rely on notes, or may be memorized. The objectives of the presentation may be buried in unnecessary information, but are available to the audience. Presentation style is easy, but may be awkward at times, or seem unpracticed. Responds adequately to questions. The presentation may run under or over the time limits.				

Will the group members work together on a new project in the future?

C	Delivers a presentation that relies heavily on notes, or is stiffly memorized. The objectives of the presentation are unclear, and the audience is not able to follow the presentation structure. Presentation style is awkward. Attempts but may not respond directly to questions. Presentation is over or under time restrictions.
F	Delivers a presentation that is read. The objectives of the presentation are unclear, impossible to follow, or not present. Presentation style is uncomfortable. Fails to respond to audience questions. Presentation does not follow the time restrictions.

Studies

Graduate attribute mapping for **Act Professionally**.

Act appropriately with respect to ethical, societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and with regard to the consequential responsibilities relevant to professional computing practice.

		Rubrics		Level			
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method
Role and responsibilities of the cybersecurity professional	<ul style="list-style-type: none"> • Appreciate the role filled by cybersecurity professionals and the imperative of the security of the public. • Describe the role of cybersecurity professionals in Quebec. • Differentiate between professional and personal roles. • Understand the professional values of the cybersecurity field: competence, responsibility, ethical conduct, and social engagement. • Distinguish between dimensions of responsibility – moral, legal and social. • Describe liability in Quebec’s legal system. • Identify legal issues and responsibility pertaining to life, occupational health and safety, and intellectual property. • Apply responsibility in professional context. 	A	Cites correct, relevant professional standards. Application of standards to project is well- detailed and thorough. If none are applicable, provides clear explanation, and indicates what kind of standards might be useful for project. Clearly indicates superior understanding of professional standards. Excellent understanding of the different dimensions of professional responsibility.	ENCs 282 INSE 351 INSE 411	INSE 452	INSE 490	Project work Assignments Written examinations Case studies
		B	Cites correct, relevant professional standards, and applies them to project. If none are applicable, clear reasoning is provided. Clearly indicates good understanding of professional standards and responsibility.				
		C	Cites relevant professional standards. Identifies the standards that apply to projects or states clearly if none are applicable. Indicates satisfactory understanding of professional responsibility.				
		F	Cites poor or provides no reference to professional standards or code; no clear evidence of appreciation or understanding of professional standards. Unsatisfactory understanding of professional responsibility.				
Professional practice	<ul style="list-style-type: none"> • Communicate through accepted professional means. • Identify relevant professional standards. • Adopt a professional conduct. • Consider their practice in the perspective of sustainability. 	A	On time delivery; Respects peers and others; full understanding of the problem; Excellent communication (written and oral) with the client (stakeholders); Always provides accurate information; fully competent in the field.	ENCs 282		INSE 490	Project work Assignments Written examinations Case studies
		B	Mostly on time; Respects peers and others; good understanding of the problem/field; very good communication (written and oral) with the client (stakeholders); Provides accurate information; competent in the field.				
		C	Acceptable time management; get along well with stakeholders; communication manner is acceptable; Provides accurate information; competent in the field.				
		F	Lacking some or all aspects mentioned above.				

Graduate attribute mapping for **Be prepared for life-long learning.**

Learn new tools, computer languages, technologies, techniques, standards and practices, as well as be able to identify and address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge.

		Rubrics		Level			
Indicators	Students can..	Grade	Definition	Introduce	Develop	Apply	Suggested assessment method
Identifying missing knowledge and learning opportunities	<ul style="list-style-type: none"> Assess the problem and identify when knowledge is missing Identify sources to seek out necessary information Self-acquire necessary information from different sources 	A	Makes explicit references to previous learning and applies in an innovative (new and creative) way that knowledge and those skills to demonstrate comprehension and performance in novel situations. Identify when knowledge is missing and seek out sources to obtain the missing knowledge	INSE 351	INSE 486	INSE 490	Project work Assignments Written examinations Case studies
		B	Makes references to previous learning and shows evidence of applying that knowledge and those skills to demonstrate comprehension and performance in novel situations. Identifies when knowledge is missing but may not fully acquire missing knowledge.				
		C	Makes references to previous learning and attempts to apply that knowledge and those skills to demonstrate comprehension and performance in novel situations. Shows some difficulty when faced with problems where knowledge is missing				
		F	Makes vague references to previous learning but does not apply knowledge and skills to demonstrate comprehension and performance in novel situations. Relies only on previous learning, without identifying missing knowledge				
Continuous improvement and self-learning	<ul style="list-style-type: none"> Continually seek out new knowledge Leverage available learning opportunities and knowledge sources to stay current 	A	Seeks out new information and latest developments	COMP 228 ENGR 233 INSE 445		INSE 490	Project work Assignments Written examinations Case studies
		B	Keeps current periodically on some aspects and developments in the domain				
		C	Maintains little connection to external improvement and self-learning sources				
		F	Fails to pursue any resources or information outside of coursework				

Graduate attribute mapping for **Demonstrate Breadth of Knowledge**

Possess knowledge in areas other than computer science and mathematics so as to be able to communicate effectively with professionals in those fields.

Indicators	Students can..	Rubrics		Level			Suggested assessment method
		Grade	Definition	Introduce	Develop	Apply	
Awareness of society and environment	<ul style="list-style-type: none"> Recognize relevance of societal impact of technology to improving innovation Categorize wide range of technology and society relationships, including economic, social, health, safety, legal and cultural aspects Demonstrate familiarity with evolution of technologies 	A	Complete understanding of environmental aspects. Effective in addressing of environmental issues leading to a better result.	INSE 351 INSE 481	INSE 411	INSE 490	Project work Assignments Written examinations Case studies
		B	Sound understanding of environmental aspects. Mostly effective in addressing environmental issues.				
		C	Environmental aspects are addressed ineffectively with little or no effect on end results.				
		F	No understanding or appreciation of the importance of environmental concerns.				
Sustainability in design	<ul style="list-style-type: none"> Identify social and environmental protection issues Locate challenges to sustainability from technological design Identify knowledge gaps and the need for additional data when designing for optimal social and environmental impact Design strategies for incorporating social sustainability Utilize appropriate models in engineering design for optimal social and environmental impact 	A	Able to demonstrate knowledge of more than one contemporary societal or community issue. Excellent discussion of technological implications of multiple contemporary issues with reasoned examples and sound rationale. Excellent discussions of one or more larger community need that is being addressed by the project partner.	INSE 351 INSE 481	INSE 411	INSE 490	Project work Assignments Written examinations Case studies
		B	Able to demonstrate knowledge of one or more contemporary societal or community issues. Able to describe technological implications of one or more contemporary issues with some examples and rationale. Able to describe at least one larger community need that is being addressed by the project partner.				
		C	With assistance, can demonstrate some knowledge of one contemporary community or societal issue. Explanation of implications of technology to a societal issue is mostly ineffective and lacking. Needs assistance to identify one larger community need being addressed by the project partner.				
		F	Unable to demonstrate knowledge of one or more contemporary societal or community issues. Unable to describe engineering implications of one or more contemporary issues. Unable to describe at least one larger community need that is being addressed by the project partner.				
Professional ethics and accountability	<ul style="list-style-type: none"> Distinguish professional ethics from ethics in Canada and Quebec Define and categorize concepts such as trust and loyalty Identify duties and obligations in the professional or engineer's code Apply professional ethics in case studies Describe accountability to multiple constituencies: engineering profession, public, client Apply accountability to professional context 	A	Can discuss aspects of professional ethics related to a given situation. Can make a sensible deduction with respect to the situation presented.	ENC 282 INSE 411	INSE 452	INSE 221 INSE 321 INSE 490	Project work Assignments Written examinations Case studies
		B	Can discuss aspects of professional ethics related to a given situation but cannot make a clear deduction with respect to the situation.				
		C	Familiar with aspects of professional ethics but cannot make a sensible deduction in the context of the given situation.				
		F	Unfamiliar with basic terminology and issues associated with professional ethics.				
Equity	<ul style="list-style-type: none"> Describe professional obligations against discrimination Appreciate gender dimensions of equity Identify economic disparity as a challenge in globalization and sustainability 	A	Shows comprehensive theoretical and conceptual understanding of social responsibility. Develops insightful examples of social responsibility. Explores the ethical dimensions of social responsibility and implications for equity. Develops a detailed analysis of the tradeoffs and ethical quandaries for businesses and individuals between the profit motive, customer satisfaction and civic responsibility.	ENC 282		INSE 490	Project work Assignments Written examinations Case studies
		B	Explains social responsibility in nuanced terms. Provides detailed examples of real-life instances of social responsibility. Recognizes the ethical dimensions of social responsibility and some equity considerations. Considers tradeoffs and ethical quandaries which occur in the practice of social responsibility.				
		C	References examples of real-life instances. Explains social responsibility in simplistic terms. Mentions tradeoffs and ethical quandaries briefly. Mentions equity issues briefly.				
		F	Provides no examples of instances of social responsibility. Fails to explain social responsibility. Does not acknowledge the ethical or equity issues in social responsibility. Fails to explore the relationship between ethical behavior and social responsibility.				

Humanities and social sciences	Awareness of subject matter that deals with the humanities and social sciences.		N/A	General Education Elective	N/A
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Appendix 5: Needs Analysis, Surveys, Market Analysis, Environmental Scans

Please see in following pages:

1. Industry expert survey questionnaire and results
2. Undergraduate student interest survey findings and questionnaire
3. CEGEP student open house survey flyer and results
4. Cybersecurity specialist job posting analytics for Canada and Quebec

Section 1: Introduction

Thank you for agreeing to participate in our survey. Your insights are invaluable in shaping the cybersecurity undergraduate programs at Concordia University. This survey should take approximately 20-30 minutes to complete.

Respondent Information

Name	<input type="text"/>
Current job title	<input type="text"/>
Organization	<input type="text"/>
Core responsibilities (e.g., management, engineering, research)	<input type="text"/>

Please indicate the size of your organization.

- Small (1-99 employees)
- Medium (100-999 employees)
- Large (1,000-9,999 employees)
- Enterprise (10,000+ employees)

Please specify the primary sector or industry of your organization. If your organization operates in multiple sectors, indicate the one most relevant to your role.

Brief Description of the Programs

The Gina Cody School of Engineering and Computer Science at Concordia University is proposing to launch two new programs: a Bachelor of Engineering in Cybersecurity Engineering and a Bachelor of Science in Cybersecurity. Led by the Concordia Institute for Information Systems Engineering (CIISE), these programs aim to equip graduates with a solid foundation in computer science principles, complemented by in-depth and specialized knowledge in various facets of cybersecurity.

The main objective of the programs is to prepare students for a rewarding career in the fast-growing field of Cybersecurity. The programs will offer students a comprehensive body of knowledge, including cryptography, foundations for secure information systems, access control, security policies and security mechanisms, operating system security, network security, security vulnerabilities and malware defense, secure programming, blockchain technology, cybersecurity ethics, cybercrime investigations, privacy, etc.

The programs will also help students develop various cybersecurity skills, such as penetration testing skills, risk assessment and security management skills, security engineering skills, security monitoring skills, incident handling and forensic analysis skills, secure network management skills, regulatory compliance, and auditing skills.

Section 2: Market Demands

How likely do you think the market demand for cybersecurity related jobs will increase in the next five

years?

- Very likely
- Likely
- Unlikely
- Very unlikely

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

How would you assess the level of need for training and skill updating in cybersecurity-related roles within your organization? Please select the option that best represents your organization's situation.

- No need
- Low need
- Moderate need
- High need
- Critical need

Does your organization face challenges in recruiting skilled professionals specifically for cybersecurity roles?

- Yes
- No
- Unsure

If yes, What kinds of positions are most difficult to hire for, and what specific skills are most in demand?

How likely is your organization to subsidize the following types of education/training opportunities for employees?

	Very likely	Likely	Unlikely	Very unlikely
Professional certification or training program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Undergraduate certificate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Graduate certificate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very likely	Likely	Unlikely	Very unlikely
Graduate diploma	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bachelor of Engineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bachelor of Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 3: Program Accreditation

The proposed BEng in Cybersecurity Engineering will be a full-time 120-credit (four-year) program designed to be fully accredited by the Canadian Engineering Accreditation Board (CEAB). The curriculum consists of the cybersecurity engineering core courses, engineering core courses, technical electives, and general education elective courses. We are also considering offering a 90-credit (three-year) BSc in Cybersecurity program that does not require engineering core courses.

What cybersecurity related job roles in your organization require CEAB accreditation (suitable for BEng graduates)? Please list the job titles below.

What cybersecurity related job roles in your organization do NOT require CEAB accreditation (suitable for BSc gradates)? Please list the job titles below.

What would be the approximate percentage of cybersecurity related jobs within your organization that require CEAB accreditation?

- Less than 20%
- 21- 40%
- 41- 60%
- 61-80%
- More than 80%
- Unsure

Please provide any additional comments you have regarding jobs that require CEAB accreditation.

Section 4: Competencies Required

Please rank the following competencies in order of importance for a cybersecurity professional, using a scale from 1 to 6, where 1 is 'Not important' and 6 is 'Critically important'.

	Not important 1	Somewhat important 2	Moderately important 3	Important 4	Very important 5	Critically important 6
Technical proficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Problem-solving skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ethical judgment and integrity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communication skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teamwork and collaboration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not important 1	Somewhat important 2	Moderately important 3	Important 4	Very important 5	Critically important 6
Continuous/lifelong learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If there are any additional competencies you believe are crucial for a graduate of our cybersecurity programs, please list them here and briefly explain why they are essential.

How important is interdisciplinary knowledge (e.g., legal, ethical, managerial) in the field of cybersecurity?

- Very important
- Somewhat important
- Somewhat unimportant
- Not at all important

Additionally, are there specific interdisciplinary areas you find most relevant for cybersecurity professionals?

Section 5: Curriculum Design

Based on your experience and industry perspective, what specific topics or areas should be emphasized in the program to prepare students for the evolving cybersecurity workforce?

What specific skills are currently in high demand within the cybersecurity job market that should be emphasized in the program?

Section 6: Industry Collaboration and Partnership Opportunities

What type(s) of experiential or work-integrated learning opportunities could your organization provide to students of our BEng/BSc Cybersecurity programs? Please select all applicable options.

- Course-based experiential learning/capstone projects (students work collaboratively to design or develop a solution to address a specific problem of interest to your organization, all within a single academic term, under the mentorship and guidance of a course instructor.)
- Onsite internships or Co-op placements
- Virtual internship
- Field projects
- Research collaborations
- Mentorship opportunities
- Job shadowing experiences
- Industry sponsored competitions or hackathons
- Live case studies or simulations
- Other (please specify):

Apart from the aforementioned experiential learning opportunities for students, what other forms of collaboration would your organization be interested in pursuing with our BEng/BSc Cybersecurity programs? These collaborations are intended to enhance program offerings and better align them with industry needs.

- Guest lectures and workshops from industry professionals
- Participating in program advisory committees
- Input into course/program design or content
- Joint research projects
- Facilitating networking events with industry experts
- Offering mentorship and career guidance to students
- Providing access to specialized tools or software for educational use
- Other (please specify):

Section 7: Industry Trends

What specific cybersecurity threats or challenges do you foresee becoming significant in the near future?



In your opinion, what are the current key trends in cybersecurity that our program should address? To the best of your knowledge, how do you anticipate the cybersecurity landscape changing in the next 5-10 years, and what impact might this have on the skills and knowledge required by professionals in this field?



Please share any additional comments, suggestions, or concerns you may have regarding the development of our Cybersecurity program.



Please click the next arrow button below when you are ready to submit your survey responses. Responses will only be recorded upon submission.

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Respondent Information

39 Responses

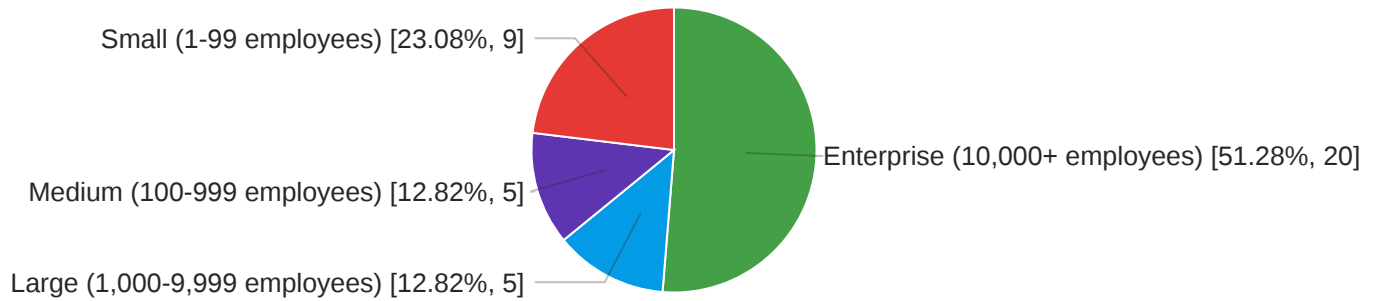
Name	Current job title	Organization	Core responsibilities (e.g., management, engineering, research)
Subhashish Chakravarty	Sr Eng Manager	Collins Aerospace	Engineering management and research
N/A	N/A	N/A	N/A
Alireza Arasteh	Head of Canada	Mandiant Consulting	Management
Bassam	Researcher	HQ	research and project management
Aurelian Constantinescu	Project Manager, Collaboration and Government Programs, and Academic Partnerships	CAE Inc.	Project management
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
Mohammad Faghani	Director of Managed Detection and Response	Accenture	Provide Managed Detection and Response services to clients
N/A	N/A	N/A	N/A
Steven Wang	Sr Director	Mistplay	Leadership of engineering teams
Boubakr	Researcher	Ericsson	R7D
CASAMIA	CEO	CREANCES ET SOLUTIONS	N/A
Remi Benito	Aircraft Cybersecurity	Bombardier	Engineering
Makan Pourzandi	Research Leader	Ericsson	Research
Warren Lee	Cybersecurity Leadership - GRC	Pratt and Whitney	Governance Risk and Compliance
Yosr Jarraya	Master Researcher	Ericsson	Research

Ribal Atallah	Cybersecurity Researcher	Hydro-Québec	project manager, cybersecurity research, AI research
Marthe Kassouf	Researcher	Hydro-Quebec	Project management and research
Bin Li	Senior Software Engineer	YMAX Communications Corp	Engineering
chen kuang	tech lead	Bell Flight	engineering
Heyang Zhao	Cybersecurity Specialist	Alstom	engineering
Plamen Hristov	Sr. Manager Internal Audit	CN Rail	management
Jerry Xiao	Manager	RdQCC LLC	Management
Julian Conte	Product Manager	Creo Solutions	Management, coordination, defining vision
N/A	N/A	N/A	N/A
Eric Chung	Manager	CAE Inc	Engineering Management
N/A	N/A	N/A	N/A
Andrée Robichaud-Véronneau	Senior Data Scientist	Ciena Corporation	Engineering
Olivier Henley	Embedded Engineer	Adacore	Emerging Markets
Layial El-Hadi	Executive Director	Fintech Cadence	Management
George Mastromonaco	V.P. Sales & Marketing	Ingenia Technologies Inc.	Sales Force Management and Product Manager
N/A	N/A	N/A	N/A
Will Edwards	Head of Cyber Services	SEL	Cyber Engineering
Fayi Zhou	Manager	EPCOR	Engineering plus Management
Hyame Alameddine	Senior Security Researcher	Ericsson	Security research

Marc-André Guérette	Director of Information Security	Rheinmetall Canada	Management
Aram Montazami	VP of R&D	Novatek International	Management of all R&D projects and teams
Wissem Maazoun	Vice-President of Innovation	BusPas Inc.	Engineering, Research
Umang Handa	Partner, National Leader, Cybersecurity as a Service	PwC	Lead Cyber as a Service for PwC Canada, Nationally
Hui Zhu	Research Scientist	Thales Group	Research and development
Mohamad El Hout	Founder	Houtech Consulting	Security consulting and headhunting
Marc Potvin	Project Engineer	Bba Inc.	Engineering
Luis Suárez	Researcher	Ericsson Research	Research 5G, 6G trust management
Patrick Jean-Baptiste	President	Sunphinx	Management
Roberto Pimentel	Director, Software Engineering	Raymond Chabot Grant Thornton	Engineering management + Sofotware Research and Development
Danial Jafarigiv	Cybersecurity Researcher	Hydro-Quebec Research Institute (IREQ)	Research

Q3 - Please indicate the size of your organization.

39 Responses



Q4 - Please specify the primary sector or industry of your organization. If your organization operates in multiple sectors, indicate the one most relevant to your role.

38 Responses

Please specify the primary sector or industry of your organization. If your organization operates in multiple sectors, indicate the one most relevant to your role.

Aerospace

Cyber Security Consulting

Power grids

Aerospace, Simulation

Technology Consulting

Mobile Gaming

Telecom

FINANCE

Business Aircraft OEM

Telecommunications

Aerospace

Telecom

Power utility

Power utility and energy

Telecommunication

Aerospace

rolling stock

transportation

Medical Device Industry

Construction technology

Defence & Security

Telecommunications

Aerospace and Aviation, Defense and Rails

Finance, tech and entrepreneurship (fintech)

Manufacturing HVAC equipment

Electric Utility

Utilities

Telecommunications

Defence

Software for Healthcare

Software development, Transportation

Digital Identity and Security

Consulting

Energy

telco

Cybersecurity Professional services

Financial Services

Power system

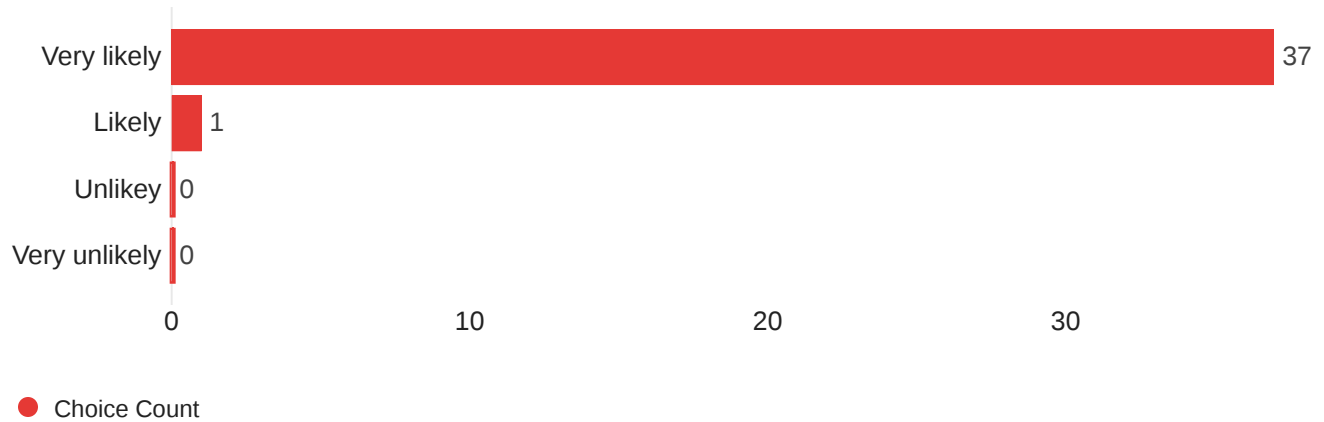
Q4 - Please specify the primary sector or industry of your organization. If your organization operates in multiple sectors, indicate the one most relevant to your role.

38 Responses



Q6 - How likely do you think the market demand for cybersecurity related jobs will increase in the next five years?

38 Responses



Q7 - What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

(Broken down by organization size)

33 Responses

Enterprise (10,000+ employees)

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

CISSP
Pen Tester
Cloud security

Researcher, security consultant

Incident Response Analyst, Risk and Compliance Analyst, Security Architect, Forensics Analyst, Vulnerability Management Analyst, Cybersecurity Advisor

All of them

IT/OT corporate network cybersecurity and aircraft cybersecurity (i.e. product security).

Researcher in cyber security, security operations for security operational centers, vulnerability testers, security administrators, developers for security aspects of Telecom systems.

Information System Security Officer
Compliance Professional
Resiliency Manager
Risk Manager
Firewall Engineer
Security Engineer

Cybersecurity consultant, IT cybersecurity expert, OT cybersecurity expert, cybersecurity researcher

Cybersecurity specialists for power grid operations (IT and OT systems) and cybersecurity researchers

cybersecurity analyst, cybersecurity engineer, cybersecurity specialist, project manager of cybersecurity

IT Auditor, Security architecture, OT security specialist/architect, CSOC specialist, Network Security Engineer, GRC

System/Software Specialist

Senior Threat Detection Engineer, 5G cybersecurity Architect, Security solution architect, Digital Forensic Specialist

Software Engineer, AI Algorithm Engineer, System Engineer, Cyber Security Engineer, Security IT Engineer, Cloud Security Engineer, Security Analyst, Cyber Security Architect, Data Scientist, Research Scientist, Project Manager, Solution Manager, Maintenance Technician

chief information security officer

These are the available jobs only in our sector (Research Institute):

1. Cybersecurity researcher (multidisciplinary) including quantum cybersecurity
2. Senior specialist for Operational Technology (OT) cybersecurity

Medium (100-999 employees)

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Sr Director of cybersecurity, director of cybersecurity

Around 100 software engineers.

We make toolchains addressing DO-178B/C, EN 50128, ISO 26262, IEC 61508, ECSS-E-ST-40C & ECSS-Q-ST-80C, and MIL-STD-498.

We develop the Ada and the SPARK subset, which is the only formally verified programming language system (compiled to native instructions) that is industrial-ready.

IT Manager

Security Analyst, Architect

Small (1-99 employees)

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

System admin, IT professional, Software Engineer

Product Security Engineer, Senior Principal of Cybersecurity, Data Protection Leader

Software development
Software architecture
Managing, protecting client data

Data management and storage

IT Management, IT Specialist, Security Officer

Software development, Researcher

Security consultant

Cloud, SOC Analyst

Large (1,000-9,999 employees)

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Cyber Security Engineer, Cyber Security Tester

Software developer, IT analyst

Project Engineer, Technical Sales, Product Development Software and Hardware Engineers, Security Analyst, Network Engineer

IT, Operational staff who Operation and Maintain Water, Electricity and Wasetwater facilities

ICS/OT Cybersecurity

Q7 - What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

(Broken down by sectors)

33 Responses

Aerospace

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

CISSP
Pen Tester
Cloud security

Information System Security Officer
Compliance Professional
Resiliency Manager
Risk Manager
Firewall Engineer
Security Engineer

Cyber Security Engineer, Cyber Security Tester

Power grids

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Researcher, security consultant

Aerospace, Simulation

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Incident Response Analyst, Risk and Compliance Analyst, Security Architect, Forensics Analyst, Vulnerability Management Analyst, Cybersecurity Advisor

Mobile Gaming

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Sr Director of cybersecurity, director of cybersecurity

Telecom

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

All of them

Business Aircraft OEM

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

IT/OT corporate network cybersecurity and aircraft cybersecurity (i.e. product security).

Telecommunications

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Researcher in cyber security, security operations for security operational centers, vulnerability testers, security administrators, developers for security aspects of Telecom systems.

Power utility

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Cybersecurity consultant, IT cybersecurity expert, OT cybersecurity expert, cybersecurity researcher

Power utility and energy

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Cybersecurity specialists for power grid operations (IT and OT systems) and cybersecurity researchers

Telecommunication

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

System admin, IT professional, Software Engineer

rolling stock

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

cybersecurity analyst, cybersecurity engineer, cybersecurity specialist, project manager of cybersecurity

transportation

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

IT Auditor, Security architecture, OT security specialist/architect, CSOC specialist, Network Security Engineer, GRC

Medical Device Industry

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Product Security Engineer, Senior Principal of Cybersecurity, Data Protection Leader

Construction technology

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Software development
Software architecture
Managing, protecting client data

Defence & Security

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

System/Software Specialist

Telecommunications

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Software developer, IT analyst

Senior Threat Detection Engineer, 5G cybersecurity Architect, Security solution architect, Digital Forensic Specialist

Aerospace and Aviation, Defense and Rails

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Around 100 software engineers.

We make toolchains addressing DO-178B/C, EN 50128, ISO 26262, IEC 61508, ECSS-E-ST-40C & ECSS-Q-ST-80C, and MIL-STD-498.

We develop the Ada and the SPARK subset, which is the only formally verified programming language system (compiled to native instructions) that is industrial-ready.

Finance, tech and entrepreneurship (fintech)

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Data management and storage

Manufacturing HVAC equipment

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

IT Manager

Electric Utility

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Project Engineer, Technical Sales, Product Development Software and Hardware Engineers, Security Analyst, Network Engineer

Utilities

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

IT, Operational staff who Operation and Maintain Water, Electricity and Wasetwater facilities

Defence

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Security Analyst, Architect

Software for Healthcare

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

IT Management, IT Specialist, Security Officer

Software development, Transportation

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Software development, Researcher

Digital Identity and Security

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Software Engineer, AI Algorithm Engineer, System Engineer, Cyber Security Engineer, Security IT Engineer, Cloud Security Engineer, Security Analyst, Cyber Security Architect, Data Scientist, Research Scientist, Project Manager, Solution Manager, Maintenance Technician

Consulting

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Security consultant

Energy

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

ICS/OT Cybersecurity

Cybersecurity Professional services

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

Cloud, SOC Analyst

Financial Services

What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

chief information security officer

Power system

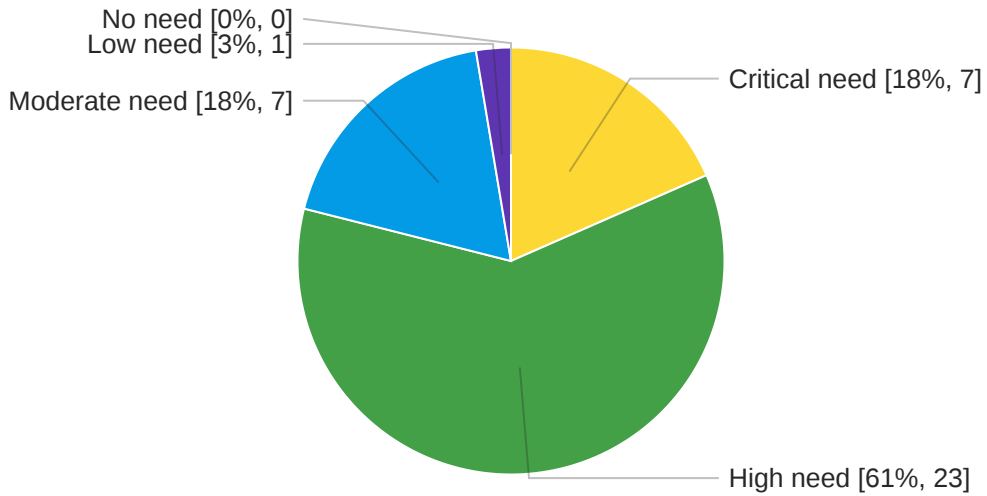
What jobs requiring professional cybersecurity knowledge and skills currently exist in your organization? Please list the job titles below.

These are the available jobs only in our sector (Research Institute):

1. Cybersecurity researcher (multidisciplinary) including quantum cybersecurity
2. Senior specialist for Operational Technology (OT) cybersecurity

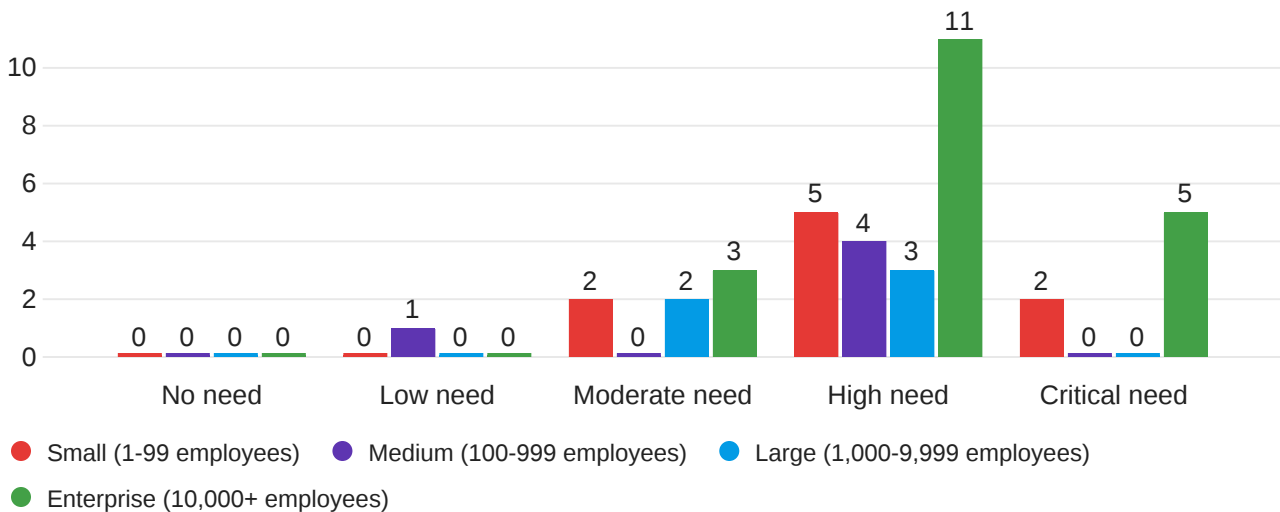
Q8 - How would you assess the level of need for training and skill updating in cybersecurity-related roles within your organization? Please select the option that best represents your organization's situation.

38 Responses



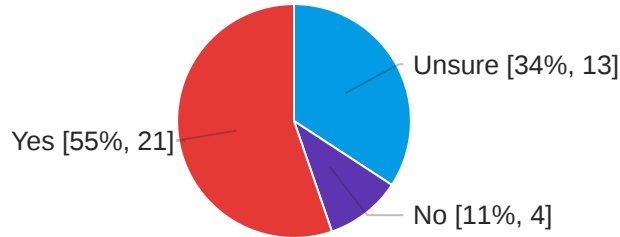
Q8 - How would you assess the level of need for training and skill updating in cybersecurity-related roles within your organization? Please select the option that best represents your organization's situation. **(Broken down by organization size)**

38 Responses



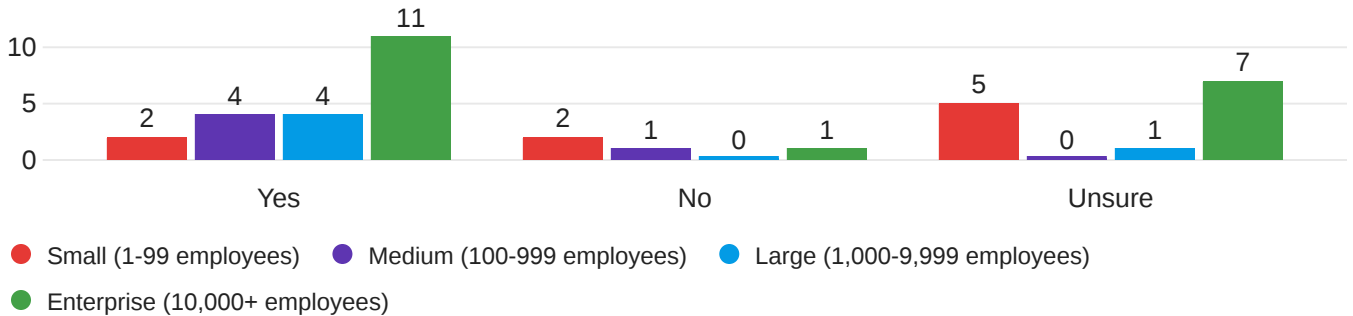
Q9 - Does your organization face challenges in recruiting skilled professionals specifically for cybersecurity roles?

38 Responses



Q9 - Does your organization face challenges in recruiting skilled professionals specifically for cybersecurity roles? (Broken down by organization size)

38 Responses



Q9 - Does your organization face challenges in recruiting skilled professionals specifically for cybersecurity roles? (Broken down by organization size)

38 Responses

Field	Small (1-99 employees)	Medium (100-999 employees)	Large (1,000-9,999 employees)	Enterprise (10,000+ employees)
Yes	2	4	4	11
No	2	1	0	1
Unsure	5	0	1	7

Q10 - If yes, What kinds of positions are most difficult to hire for, and what specific skills are most in demand?

21 Responses

If yes, What kinds of positions are most difficult to hire for, and what specific skills are most in demand?

Expert IR or Penetration testing resources, and security engineers

Incident Response Analyst, Risk and Compliance Analyst, Security Architect, Forensics Analyst

Most difficult to hire: Having knowledge in both aircraft systems and cybersecurity.

security experts for running operational security, vulnerability testing and management

cybersecurity researcher with power background

IT security specialists, and cybersecurity professionals for industrial control systems

Avionics and Cyber Security knowledge

cybersecurity engineer, project manager of cybersecurity. Organization is looking for someone who understands the cybersecurity concepts, best practices, auditing, and be able to make decision regarding project cybersecurity requirements and technology.

Security Architecture, OT security, GRC, IT Auditor

Product Security Engineer who is able to take care of Security Risk Analysis, Security Regulations, and privacy tasks

Cybersecurity for Operational Technology for Defence & Security programs that require ITAR, Controlled Goods and NATO Secret (or higher)

Engineers with expertise in low-level programming and system-level concerns are becoming increasingly scarce in the industry. Certification engineers are scarce too.

IT Network managers with knowledge in Cybersecurity

Industrial Control System experience with cybersecurity expertise is desired and very rare.

network security specialist. Skills such as scripting, control and framework, intrusion detection

Architect

Cloud development

Cyber Security Engineer, Software Engineer, System Engineer

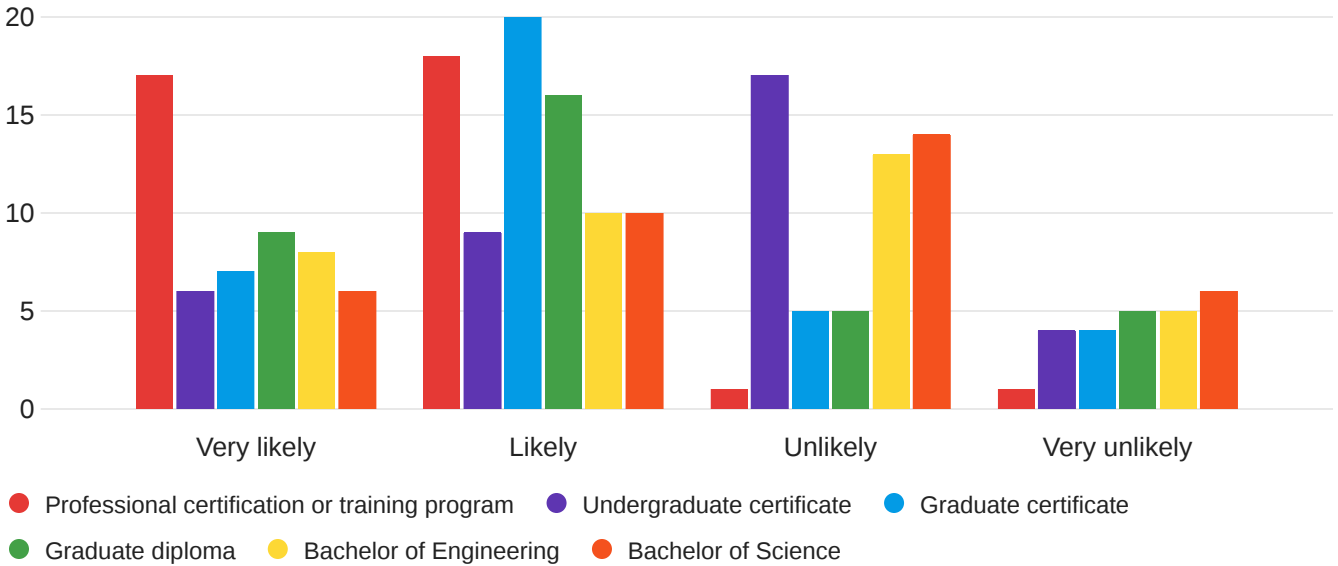
ICS/OT Cybersecurity or Cyberphysic

Architecture and SOC analyst

Multidisciplinary knowledge applications for the cybersecurity analysis (Power system, communication network, computer programming/science)

Q11 - How likely is your organization to subsidize the following types of educati...

38 Responses



Q11 - How likely is your organization to subsidize the following types of educati...

38 Responses

Field	Very likely	Likely	Unlikely	Very unlikely
Professional certification or training program	17	18	1	1
Undergraduate certificate	6	9	17	4
Graduate certificate	7	20	5	4
Graduate diploma	9	16	5	5
Bachelor of Engineering	8	10	13	5
Bachelor of Science	6	10	14	6

Q13 - What cybersecurity related job roles in your organization require CEAB accreditation (suitable for BEng graduates)? Please list the job titles below.

33 Responses

What cybersecurity related job roles in your organization require CEAB accreditation (suitable for BEng graduates)? Please list the job titles below.

Avionics Cybersecurity Researcher
Cybersecurity researcher
Embedded Cyber Researcher

Associate roles for

Incident response consultant
Red team consultant
Strategic cyber security consultant

None

I wouldn't say any job role requires a CEAB accreditation for my organization

/

Don't know

Security operational personal, developers with security background, vulnerability testers, security architects

P&W Canada Product Security team

No data

N/A

Electrical and computer engineering

System admin, Software engineer

cyber security engineer / designer

Cybersecurity Engineer

security architecture
difficult to say for the rest as industry certifications and experience is primary asset

product security engineer

None at the moment

System/software specialist

Not sure about requirements

- Software/Embedded Engineers
- Certification Engineers

NA

None

None

IT network specialist and general software and hardware engineering

Architect

Security officer, IT specialist.

System engineers, Cloud architect, AI developer, Data engineers

None

Any technical and engineering position

None.

ICS/OT Cybersecurity Engineer

I dont know

Penetration Tester
 Security Software Developer
 Incident Response Analyst
 Network security engineer
 OT security engineer
 Cloud security engineer
 IT/OT Auditor

Q14 - What cybersecurity related job roles in your organization do NOT require CEAB accreditation (suitable for BSc gradates)? Please list the job titles below.

32 Responses

What cybersecurity related job roles in your organization do NOT require CEAB accreditation (suitable for BSc gradates)? Please list the job titles below.

Senior roles for

Incident response consultant
 Red team consultant
 Strategic cyber security consultant

All

Any cybersecurity role e.g. Cybersecurity analyst

/

Don't know

Security researchers

P&W cybersecurity requires a bachelor's degree. Cybersecurity related certifications are preferred.

No data

consultant, expert, researcher

Cybersecurity specialist for IT systems and for operational technologies (OT) applied to power grids

IT professional

cyber security tester / technician

Cybersecurity analyst, cybersecurity specialist, project manager of cybersecurity

most of security related jobs, as I mention industry certifications like CISSP, CISM, CISA and the like of more of an asset

Product Security Manager

Software architect
 Full stack developer
 Cloud security specialist

N/A

Not sure about requirements

Hard to say. None?

NA

Programmers

Project Engineer, HW/SW Product Development, Security Analyst, Network Engineer

lab technologist and plan operators

Analyst

None

NA

All of the roles we hire for

Unsure

Any. The focus for cybersecurity is on experience and ability to learn new technologies and frameworks.

ICS/OT Cybersecurity professional

Chief Information Security Officer

Risk Analyst

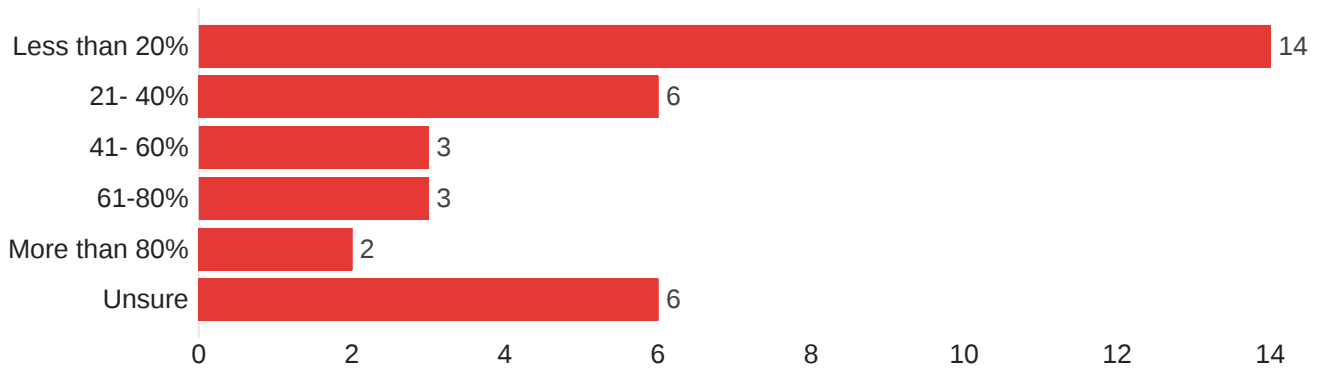
Security Consultant

Security Architect

Data Security Strategist

Q15 - What would be the approximate percentage of cybersecurity related jobs within your organization that require CEAB accreditation?

34 Responses



● Choice Count

Q16 - Please provide any additional comments you have regarding jobs that require CEAB accreditation.

11 Responses

Please provide any additional comments you have regarding jobs that require CEAB accreditation.

N/A

We don't make a specific need for CEAB accreditation in any role at my company

/

No data

We are a US company and will not mandate the use of the CEAB issued by the Canadian government, but it can be used as a reference.

While we don't hire many cybersecurity experts internally, we support our startups by hiring and integrating cybersecurity people in their teams. Those roles include:

IT & Cyber Risk and Control Analyst
 Compliance Analyst, AML
 DevOps Engineer
 Full Stack Developer
 Security Specialist- Solutions and Assessments
 Security Engineer
 Client Implementation Specialist
 Compliance Supervisor, AML
 Lead Network and Security Engineer
 Lead Developer - Web Technologies
 IT Infrastructure Engineer

Accredited degrees are desirable but can be substituted with experience and expertise currently.

n/A

An accredited degree definitely helps the student compete for the job.

Involve safety & security risk assessment

The program should offer a trajectory for students to acquire multidisciplinary knowledge pertinent to positions requiring CEAB accreditation!

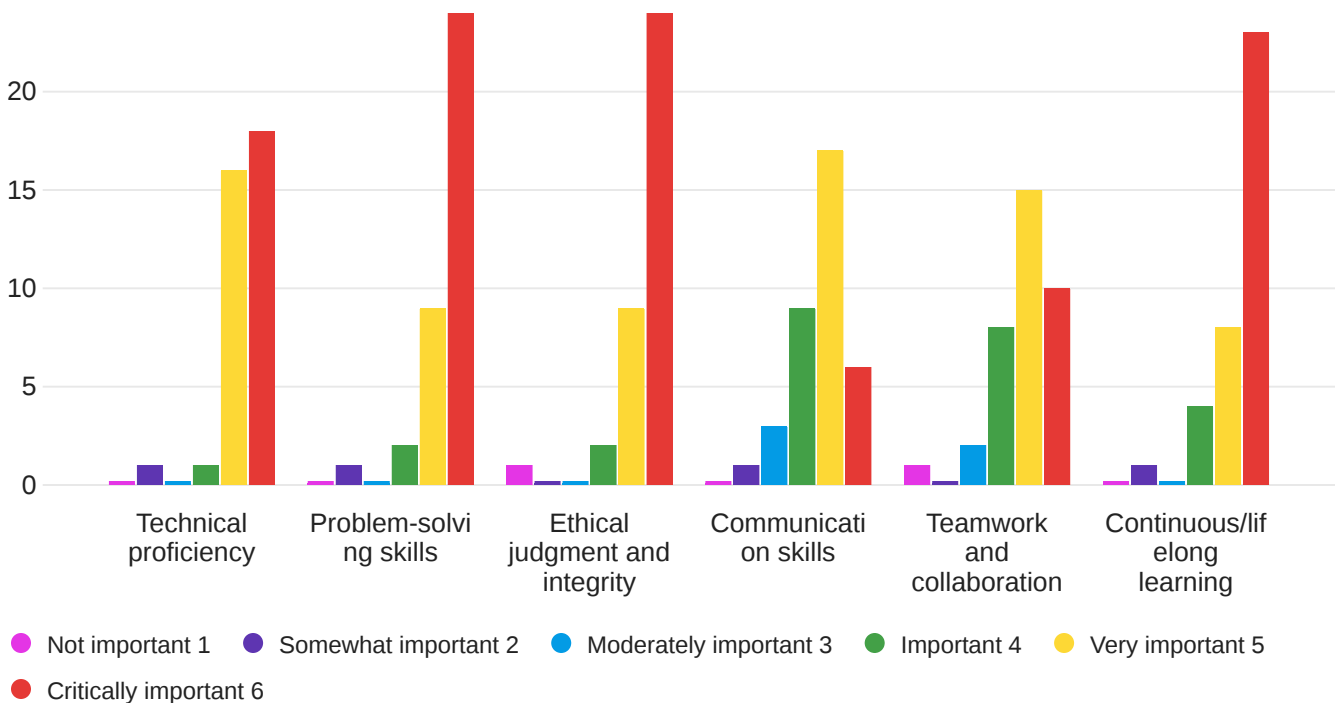
Q17 - Please rank the following competencies in order of importance for a cyberse...

36 Responses

Field	Not important 1	Somewhat important 2	Moderately important 3	Important 4	Very important 5	Critically important 6
Technical proficiency	0	1	0	1	16	18
Problem-solving skills	0	1	0	2	9	24
Ethical judgment and integrity	1	0	0	2	9	24
Communication skills	0	1	3	9	17	6
Teamwork and collaboration	1	0	2	8	15	10
Continuous/lifelong learning	0	1	0	4	8	23

Q17 - Please rank the following competencies in order of importance for a cyberse...

36 Responses



Q18 - If there are any additional competencies you believe are crucial for a graduate of our cybersecurity programs, please list them here and briefly explain why they are essential.

17 Responses

If there are any additional competencies you believe are crucial for a graduate of our cybersecurity programs, please list them here and briefly explain why they are essential.

N/A

Understanding of the domain where is applied cybersecurity (e.g. avionic domain, ..) and specially in OT environments where old legacy systems coexist with new systems and where availability is the first priority.

the students should have also good programming skills and knowledge about software development. This is necessary to be able to understand software developers and interact with them to design security in the software.

Project Management skills (i.e. ITIL)
Industry cybersecurity frameworks (ISO 27001/NIST 800-53/etc)

Factual decision making,

It is critically important for a cybersecurity professional working in an industrial control system environment to have a multidisciplinary training including a minimal technical proficiency in OT and system control and automation.

proficiency in avionics and fundamental knowledge for aircraft system design

Technical report writing: to documents the finding/ analysing of cybersecurity problems/ testing.
Priority/ time management: facing multiple tasks/ multipl projects is often the case, the need of managing priorities is something I learned after graduation.

A co-op may be very helpful.

Innovation:

- Mindset of continuous improvement
 - The ability to look at problems in new ways or anticipate new problems and develop novel solutions
- The methods of cyber attacks are evolving rapidly and require more than just reacting. We need to be proactive in our solutions, especially for mission and safety critical systems.

As an AdaCore engineer, my perspective isn't about promoting my company or our languages for personal gain but rather about sharing a critical insight into the cybersecurity field. The reality is that simply patching traditional, inherently loose system-level programming languages, isn't enough for robust cybersecurity. These languages often leave new professionals lost and overwhelmed by a myriad of idioms, falsely boosting their confidence while masking their true skill level. Many of my graduating students believe they are somewhat coding wizards, but in reality, they're making simple tasks complicated. Additionally, burying future professionals in layers of process and protocol is a misguided approach.

From my vantage point, seeing mission-critical, industrial applications of Ada and SPARK, it's clear these tools offer something unique - rigor, clarity, and inherent processes that other technologies simply can't match. They've been refined over decades by the brightest minds in the field. For a cybersecurity program to be credible and effective, it must teach these languages as foundational elements. Ada and SPARK don't just teach coding; they instill a mindset of precision and reliability essential for the future of cybersecurity. May I remind you that SPARK is formally provable of runtime defects to the point that removal of runtime checks and optimization can be pushed to surpass C performances: this is huge.

NA

able to quickly learn the nature of the business they are supporting, which means strong analytical skills

Machine learning and artificial intelligence

Searching skills (many students do not know how to find and search for the needed information)

NA

Identity and Access management (PAM, IGA, CIAM)

Data Loss Prevention (Data discovery, classification, remediation)

DevSecOps/Automation

Detection Engineering

Detection investigation

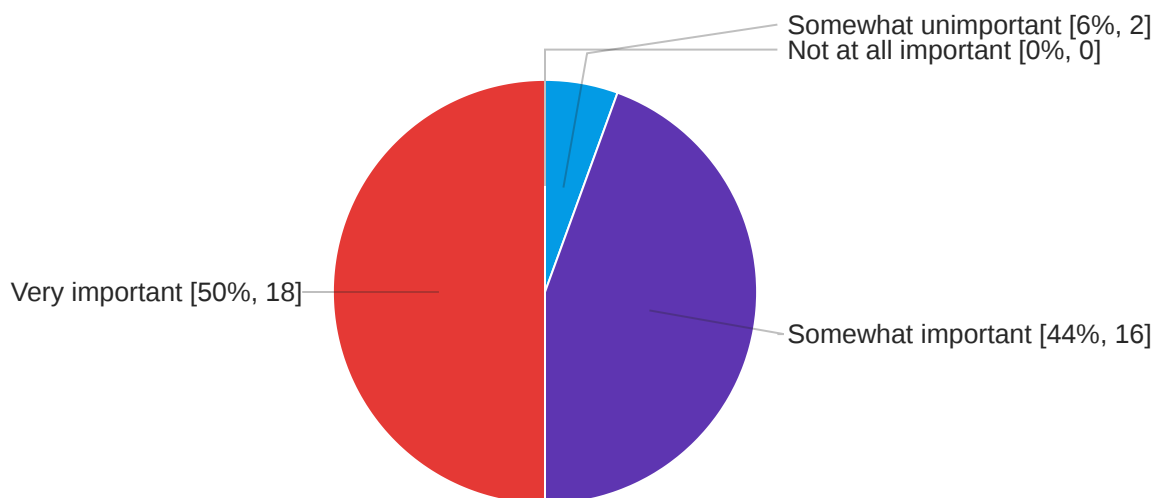
Response and recovery from cyber attack

Cyber compliance and regulations

Learning more about Operationa Technologies such as Industrial Control Systems and also biomedical appliances/equipments

Q19 - How important is interdisciplinary knowledge (e.g., legal, ethical, managerial) in the field of cybersecurity?

36 Responses



Q20 - Additionally, are there specific interdisciplinary areas you find most relevant for cybersecurity professionals?

19 Responses

Additionally, are there specific interdisciplinary areas you find most relevant for cybersecurity professionals?

Machine Learning

N/A

Should add the discipline of "communication", e.g. how an organization can manage the communication to the outside (media, shareholders, ..) in case of a cyberattack,.

Legal aspects of security are important to be understood by the students to be able to judge the necessity actions.

IT

Requirement management; business analysis; project management

it really depends on the role, the more technical the role the less need for interdisciplinary competencies

risk assessment

Legal implications of data breaches

NA

Automation and networking

N/A

Exposure to different new technologies and related threat vectors such as telecommunication networks, cloud infrastructure, network function virtualization and software defined networking and all their related management frameworks. Further the role of machine learning and artificial intelligence in cybersecurity, mainly to automate and enforce cybersecurity but also exposure to threats that can target them

Privacy, Engineering, Legal

NA

Software engineering, artificial intelligence

Risk & Vulnerability management, Ethical/Integrity, Health & Safety, Machine safety, Process Safety, Environmental impact, Operational consideration on ICS (integrity, availability, etc.)

Software System Architecture, Design and Engineering

1. Computer Science and Information Technology,
2. Networking: comprehend the architecture and vulnerabilities of networks,
3. Cryptography,
4. Data Analytics,
5. Operation Technology (OT) including Industrial Control Systems (ICS)

Q21 - Based on your experience and industry perspective, what specific topics or areas should be emphasized in the program to prepare students for the evolving cybersecurity workforce?

33 Responses

Based on your experience and industry perspective, what specific topics or areas should be emphasized in the program to prepare students for the evolving cybersecurity workforce?

Fuzzing, CPS, MBSE

Application security
Modern Architecture Frameworks and Security engineering

Artificial intelligence, cloud computing

Cloud security, knowledge of how major cloud providers work e.g. AWS, GCP, Azure

DevSecOps, Cloud Native security (k8s)

Problem Solving
Learn how to Think
Think out the Box

In addition to the traditional topics of cybersecurity, the program should include acquiring knowledge in AI/ML and quantum computing (i.e. post-quantum cryptography, ...)

vulnerability testing and operational security, system hardening, application security, software security development, knowledge about different malware, network security. Programming skills also should be taught as it has become the basic way to program security appliances and for implementing the right way as a built-in security in the applications.

Business functional interdependencies - IT Architecture, Legal - Global Trade, Factory Operational Technologies, IOT

Zero-trust, Quantic computing impact on security, Automation, AI/ML,

IT cybersecurity practices, OT cybersecurity practices, multi-disciplinary background

Critical infrastructure technologies in general (including computer networks, telecommunications, control systems, etc.) as well as social engineering techniques

Threat prevention, discovery, and recovery. Ways to utilize AI in cybersecurity.

1. understand the industrial standard and best practice
2. analysis and design knowledge
3. security measurement and objective verification process

Hand-on projects: OS commands; networking and cloud configuration; coding. Encourage students to participate in events like CTF.

Risk identification and assessment, threat identification, security governance

for our medical device industry, strong professional skilled in U.S. Food and Drug Administration (FDA), Verification and Validation (V&V), Systems Testing and Security Risk Analysis, Security Regulations, privacy, and Corrective and Preventive Action (CAPA) are very important.

Cybersecurity laws

Cloud security

Data science

Protection of legacy systems.

Integration of systems with different levels of security and cybersecurity resiliency.

Big Data safety concerns, Employee training on how to avoid breaches, Data privacy concerns

Low-level architecture and coding. They need to be very strong. Devices, drivers, OS services and architecture, allocators, network stacks, core protocols, bounded data structures, resource ownership and management, etc.

When writing code make sure it is completely safeguarded

Industry specific lab modules such as Energy Sector testbed where students get experience with threat hunting, configuration, disaster recovery, etc. on a practical level. Documentation is a very important skill for helping visualize dataflows, architecture diagrams, security plans, test procedures, etc.

Trust management (concept of zero trust)

MITTRE framework

Data protection acts. Legal requirements. Threat prevention

Communication systems, Systems security

Identity and Access management (PAM, IGA, CIAM)

Data Loss Prevention (Data discovery, classification, remediation)

DevSecOps/Automation

Detection Engineering

Detection investigation

Response and recovery from cyber attack

Cyber compliance and regulations

artificial intelligence

Projects, projects, projects.

Theory is fine but no student in a cybersecurity program should finish their degree with hands-on experience in technical projects and/or auditing and/or governance.

Ideally, there would be a co-op program so students have "corporate experience" under their belt by the time they graduate.

More OT Cybersecurity consideration; your program is very focus on IT cybersecurity exclusively

assessment of the right tools to do a task

Cloud,
Security Auditing
Pen test

Security principles, Risk management, and Security architecture.

Quantum cybersecurity, Operational Technology (OT) and Information Technology (IT) cybersecurity

Q21 - Based on your experience and industry perspective, what specific topics or areas should be emphasized in the program to prepare students for the evolving cybersecurity workforce?

33 Responses



Q22 - What specific skills are currently in high demand within the cybersecurity job market that should be emphasized in the program?

31 Responses

What specific skills are currently in high demand within the cybersecurity job market that should be emphasized in the program?

AI/ML, MBSE

Incident response
Penetration testing
Application security
Security engineering

Amazon web services (AWS), Microsoft Azure, generative AI

Cloud security & knowledge of cloud computing platforms, knowledge of software development lifecycle (shift left security)

Cloud native security (k8s)

Threat hunting

As the demand is more crucial today to expand cybersecurity knowledge for the small and midsize enterprises (SME), I should expect the program to be easily applicable to the SME job market.

vulnerability testing and operational security, system hardening, application security,

Vulnerability Management, Insider Threat, Incident Response, System Incident & Event Management, Change Management, Compliance, Risk Management

No data

AI for cybersecurity

Artificial intelligence, simulation of industrial control systems and communication networks, advanced communication technologies, quantum technologies

How to monitor the system to identify security breach.
How to recovery from security breach.

Test design and simulation skill

cybersecurity concepts, networking configuration, cloud security implementation, writing and auditing codes, reading and creating documentations.

Regulations and standards shall be emphasized

Cloud security
Threat response
Risk management

Network routing (knowing what port scanning, low level mechanism of access are), web design and security (SQL injection)

We have the Nvidia Automotive and Security division looking to staff, with me personally, new engineers proficient in SPARK.

Key skills can include: comprehending complex technical matters, documenting security certifications, conducting risk assessments, researching and implementing new security solutions, analyzing weaknesses, and collaborating with vendors to foster a culture of cybersecurity awareness.

Effective communication

Vulnerability Assessments, Networking (switches, routers, firewalls), Forensic Analysis, Threat detection, System Architecture, Threat Modeling, Infrastructure Services (Active Directory, Domain Controller, Radius Server, Log Collection, Virtualization, etc.)

threat intelligence, social engineering, mobile device security, cloud security, data protection, risk assessment, etc. to name a few. Communication skill training is also a must

Incident management and response
Vulnerability management
Pen testing
Ethical hacking
Scripting languages and coding skills

Threat prevention and mitigation. Data privacy acts and their requirements in case of incidents. Tool and required measures for prevention of incidents.

ML systems and AI

AI development skills; Software development methodologies (like DevOps or DevSecOps); Communication skills

Cloud security, Network Security (firewalls, load balancers, proxies, vpn gateways), knowledge of security frameworks, some automation/python skills.

Knowledge of Industrial Control Systems and considerations related to these systems (risks, safety, physical security, cybersecurity, operability, system integrity, availability, etc.)

SOC Analyst and cloud

IT and Networking Skills and Threat Intelligence Skills

Knowing how to work with intrusion detection systems, threat hunting, risk analysis, monitoring/detection/mitigation frameworks, designing secure architecture using the recommendation and standards

Q22 - What specific skills are currently in high demand within the cybersecurity job market that should be emphasized in the program?

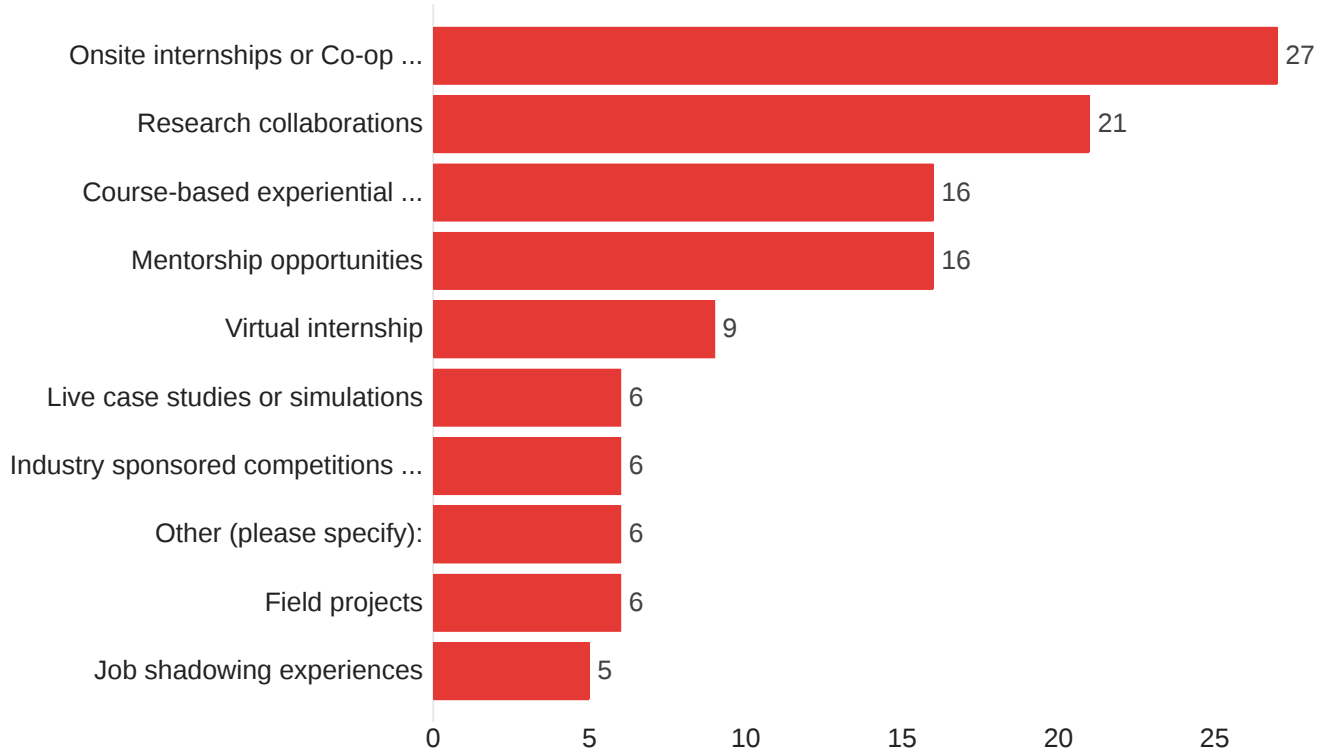
31 Responses



Q23 - What type(s) of experiential or work-integrated learning opportunities could your organization provide to students of our BEng/BSc Cybersecurity programs? Please select all applicable options.

- Selected Choice

35 Responses



Q23_7_TEXT - Other (please specify): - Text

6 Responses

Other (please specify): - Text

We're not currently offering any of this opportunities.

Entry-level certificates

perhaps few of the others above as well

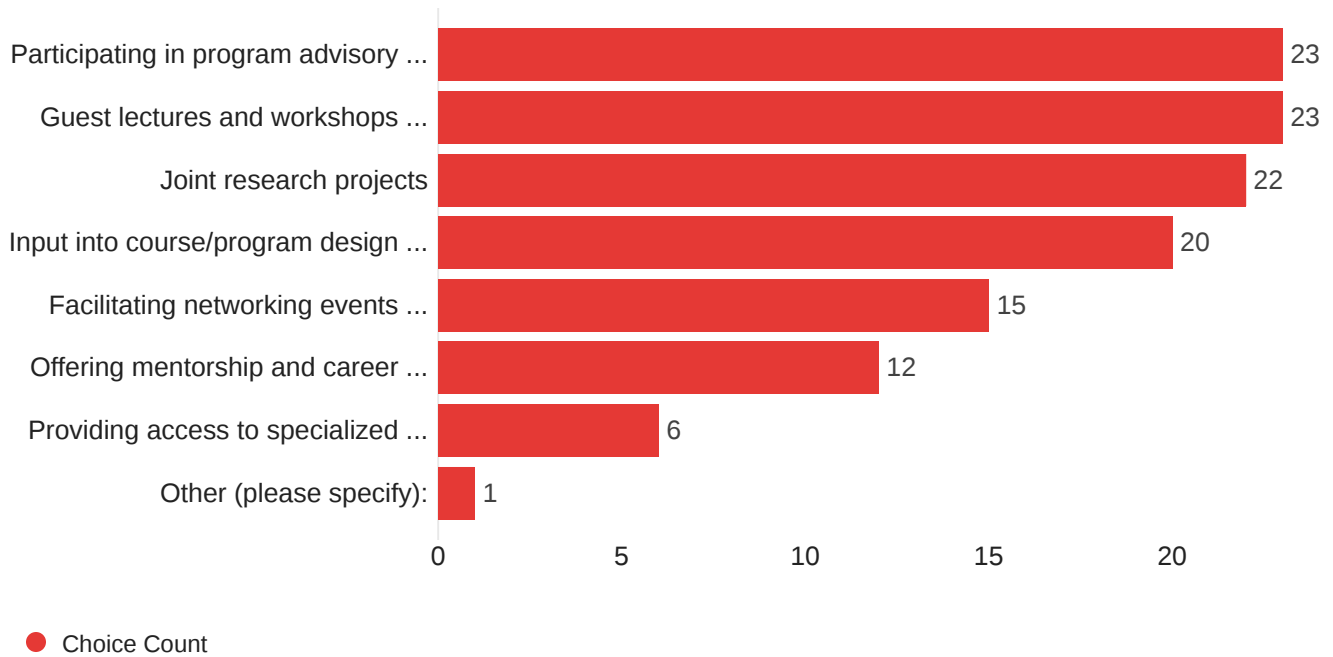
Connecting them to our startups who are hiring for internships or placements.

ICS Cybersecurity Bootcamps

Short term based assignments

Q24 - Apart from the aforementioned experiential learning opportunities for students, what other forms of collaboration would your organization be interested in pursuing with our BEng/BSc Cybersecurity programs? These collaborations are intended to enhance program offerings and better align them with industry needs. - Selected Choice

35 Responses



Q24_6_TEXT - Other (please specify): - Text

1 Responses

Other (please specify): - Text

We're not currently offering any of this opportunities.

Q25 - What specific cybersecurity threats or challenges do you foresee becoming significant in the near future?

32 Responses

What specific cybersecurity threats or challenges do you foresee becoming significant in the near future?

People retention and talent management

Supply chain attacks, cloud & cloud native security

TH and IR

Increasing usage of AI in future cyber threats and usage of quantum computing. Need to be more resilient to cyberattack (the question today is not if but when it will happen, ..)

attacks toward cyber critical infrastructure, enterprise attacks (e.g., ransomware), industrial and political espionage

Generative AI Deep Fakes, Spear Phishing, Smishing, all forms of social engineering

AI powered attacks
quantum-AI powered attacks

Challenges related to the expected integration of quantum computing, IoT and industrial IoT, and EDGE computing.

How to deal with AI in the cybersecurity space.

cyber security in aerospace industry

AI technology to substitute the entry-level cybersecurity professionals; The trend to migrate to cloud and the shortage of professionals that understand cloud security.

growth of AI usage by threat actors

data breach, hacker attack, cloud security, regulatory compliance.

Cloud attacks
IoT hacking

Increasing exposure of legacy systems due growing interconnectivity.

The use of AI to exploits in systems.

Data privacy concerns, AI-generated phishing attempts, AI-generated voice fakes, deep fakes scams.

Covert Breaches. Considering the thousands of CVEs (Common Vulnerabilities and Exposures) we've identified, it's alarming to think about the vast number of dormant or non-publicized vulnerabilities affecting closed-source and open-source systems.

NA

Cyber Ransomware

Distributed Energy Resources and Electric Vehicles will create an attack surface that we are not ready to manage.

cloud security since more and more data are migrating to cloud

I foresee an expansion of threats targeting physical infrastructure that leverage the cloud by exploiting virtualization technologies. Threats exploiting IoT devices are also likely to increase with the increase of the number and type of these devices and their related vulnerabilities. Further, threats exploiting different protocols of the OSI model will continue to exist, especially those related to the application layer that are usually overlooked.

Countering more sophisticated ransomware and threat using AI tools.

Communications protocol and data engineering

Technology: With the advent of AI, problem solving skills will be key for cybersecurity professionals. Three hyperscalers: Microsoft, Google and Amazon will take lion share of the market. Software development and coding skills will be very important in cyber

People: I see a number of professionals entering the market, however, not having the proper training/skillset to execute the job. The quality of students graduating in this space is key

Cybersecurity threats to cloud computing.

With more focus on cloud security, I'm seeing less and less focus on on-site security tools. There will probably be a shortage of such skills in few years.

Significant lack of ICS/OT cybersecurity professional in the next 3 to 5 years.

larger network footprint.

attacks i the wild, not detected

Cybersecurity Innovation

Supply chain compromise of software dependancies. Advent of AI-aided highly sophisticated attacks. Loss of privacy.

AI-based cyberattacks, Transitioning to Quantum-Safe Encryption, Monitoring and Detection: correlation algorithms for IT/OT events/logs to detect the cyberattacks in real-time

Q25 - What specific cybersecurity threats or challenges do you foresee becoming significant in the near future?

32 Responses



Q26 - In your opinion, what are the current key trends in cybersecurity that our program should address? To the best of your knowledge, how do you anticipate the cybersecurity landscape changing in the next 5-10 years, and what impact might this have on the skills and knowledge required by professionals in this field?

28 Responses

In your opinion, what are the current key trends in cybersecurity that our program should address? To the best of your knowledge, how do you anticipate the cybersecurity landscape changing in the next 5-10 years, and what impact might this have on the skills and knowledge required by professionals in this field?

AI integration (offense and defence)

DevSecOps, Cloud & Cloud Native security

Industry leaning more and more into AI and automation to detect and prevent security breaches e.g Wiz, Lacework, Snyk, Orca Security etc.

Incident responses and proactive defense

Appart of all technological, legal and ethical aspect of cybersecurity, the next challenge will be how to face the increasing threat of social engineering with the developement of the AI tools (ChatGPT, ...) that will come with social media manipulation and privacy issues.

I personally believe the attacks on infrastructure in general are going to increase. So, there is an increasing need for experts but also a higher degree of automation and AI/ML usage to address the lack of security professionals.

cybersecurity data analytics, AI development for cybersecurity purposes (i.e. event management), Factory cybersecurity, Network segmentation

With the recent advancements in AI, quantum computing, and cybersecurity, the threat landscape is evolving very quickly. Industries such as power utilities are forced to evolve and adapt their cybersecurity practices. As a result, cybersecurity professionals have to be aware of the AI advancements and their impact on cybersecurity approaches and practices. They also need to be experts in the system model that they are protecting (Informational/Operational Technology)

Cyberattacks against critical infrastructures are expected to become more frequent and more severe. The tools and the knowledge needed to understand the potential impact of such attacks as well to design, perpetrate and mitigate them should be provided to students as of undergraduate programs. In this context, the establishment of multidisciplinary training programs that prepare skilled workforce is highly required.

With the rapid development of AI, we'll probably see its usage on both sides of the issue. It'll be interesting and important for the students to know to deal with that.

the maturity of the industrial standard for the cyber security design and process, the requirement from the certification authority i.e FAA, TCCA and EASA and the evolution of IT especially the AI

Cloud security, networking virtualization, higher computing capacity to burst-force the security, security analysis automation

using AI for cybersecurity defense, protecting OT infrastructure

current key trends in cybersecurity: incident response and threat hunting, cybersecurity skills gap, and AI in security.

anticipated changes in the cybersecurity landscape: increasing regulation, remote work and hybrid environment. impact on skills and knowledge required: adapt to emerging technologies, focus on compliance, privacy expertise.

Cloud security and data privacy.

Yes, IoT hacking, AI powered attacks and cybersecurity regulations

The ever increasing amount of cyber attacks or intrusions will require the use of AI to analyse the impact and address them. Human Autonomy Teaming and AI Trustworthiness will need to be addressed. In 5-10 years, Quantum technology will become a game changer for encryption and communication. Cybersecurity professionals will need to know how to work within a quantum computing framework.

Ai should be at the center of the training, given its potency in creating hooks for simple employees to initiate breaches.

Rigorous processes embedded within language and language toolset ecosystems.

NA

White collar crime frightens the entire industry specifically as software moves rapidly to the cloud.

The industry will be more dependent on communication networks, cloud resources, and remote support which all present challenges for cybersecurity.

AI application in cyber attacking is increasing this also change the landscape of Cybersecurity. AI knowledge is a must for the professionals in this field.

With the increase adoption of automation through machine learning and artificial intelligent techniques, the cybersecurity landscape is likely to evolve towards threats related to machine learning models and their accurate behavior especially that these models are highly dependent on the data they are trained on and which can be tampered. Further, data privacy and anonymization techniques will become more important especially with the new services foreseen for 6G.

Cloud data security on private and shared data lakes. Private data protection in AI tools context.

Cloud and data management

Cyber attacks will rise due to the use of Augmented Reality, Virtual Reality, Internet of things and widespread use of technology

AI application in cybersecurity is one of the main key trends. I anticipate the cybersecurity will become more and more essential not only to companies but also to individuals, especially in this post-pandemic era. For example, remote working will become a big security challenge for all companies, and online identity verification requires high security of digital information of individuals. This impact requires the professionals not only have general cybersecurity knowledge, but also be familiar with some specific security fields.

Cybersecurity risk related to ICS/OT will increase significantly in the next 5-10 years. ICS are the critical assets of industries; without them no production will happen and the economical/financial impact will be catastrophic.

Wider Attack surface due to widespread use of cloud based services and highly connected supply chains. Digital supply chain risk mitigation. Also identify systems are increasingly a target for attackers.

Q27 - Please share any additional comments, suggestions, or concerns you may have regarding the development of our Cybersecurity program.

14 Responses

Please share any additional comments, suggestions, or concerns you may have regarding the development of our Cybersecurity program.

Diversity of graduates (culture, gender), duration of the programs (condensed programs, certificates)

This program will need to be constantly adapted due to the rapid changing of the cybersecurity domain and on the other side the critical needs of the industry (specially SMEs) for cybersecurity.

Courses based on the study of use cases stemming from the reality of critical infrastructure operations and services might be very useful for the training of future cybersecurity analysts.

Try to offer some hands-on training. For example, divide the students into 2 groups working on opposite sides of a system. One side tries to crack it, while the other side tries to protect it.

The course should include both theoretical concepts and hands-on practical applications in 50/50.

There are different fields within cybersecurity, each has a specific focus of skills (pentesting, network sec, application sec, DevSecOps that requires stronger coding skills). It would be valuable to introduce those topics to students as soon as they understand the basic concepts in order to allow them opportunities and time to dive into fields of their choice.

I commend this initiative, as this is front and center in the concerns of a big organization nowadays, since we all collect one form or another of data from our partners.

As a cybersecurity program, you must focus on equipping the students with comprehensive, in-depth knowledge and skills that align with the current and evolving demands of the field. To achieve this, the curriculum should encompass things like:

Certification Standards Analysis: Teach students to understand, compare, and critically assess various certification standards. This knowledge will enable them to discern the most appropriate standards for different projects and recognize the strengths and weaknesses of each.

Architectural Understanding: Educate students on identifying and designing well-structured systems. These systems should embody simplicity, ease of maintenance, embedded processes, and clarity, supported by solid conceptual and semantic frameworks. This understanding is crucial for creating systems that are not only efficient but also resilient to cyber threats.

Testing Methodologies: Provide in-depth training in various testing methodologies, including unit testing, coverage testing, fuzz testing, and formal verification. Students should learn the nuances of each method to applying them effectively in different scenarios, thereby enhancing the security and reliability of the systems they work on.

System Critique and Analysis: Encourage critical analysis of complex systems like the Linux kernel. Students should understand why smaller, more controlled operating systems or even bare metal runtimes, such as Ada certifiable bare-metal profiles, are often preferred in highly mission-critical projects due to their reduced attack surfaces.

Vulnerabilities of Virtual Machines, Interpreters, and dynamic typing: Teach the inherent risks associated with virtual machines, interpreters, and dynamic approaches. Students should be able to identify and mitigate the vulnerabilities that these components introduce into systems.

Capability-Based System Design: Introduce students to the concept and design of capability-based systems. Understanding these systems will provide them with a broader perspective on secure system architecture and its implementation.

Focus on Hard Skills: Shift the educational focus from agile, flexible methodologies and hacking culture to hard, technical skills. Cybersecurity is a field grounded in expertise and knowledge, and your program should reflect this by prioritizing concrete skills over procedural knowledge.

NA

Put less focus on certifications and more focus on hands-on exercises that allow students to gain experience solving real-world challenges with technology.

It is a great news that the University takes the proactive approach to develop this program and the key is to address major issues instead of a broader and superficial program. Employers want to have a graduate who can solve problems with the knowledge and skills they obtained in school.

NA

Cybersecurity is a very good and important field for a college to expand its academic programs. The demand for well-trained cybersecurity professionals is increasing rapidly.

Undergraduate Student Interest Survey Findings

To assess interest in the proposed program, we also surveyed 2,500 engineering undergraduates in Gina Cody School of Engineering at Concordia University, of which 536 responded (a 21% response rate). These students are from two degree programs, Bachelor of Computer Science (162, 30%) and Bachelor of Engineering (374, 70%). The survey probed students' likelihood to enroll, the program's alignment with their academic and professional goals, and their interest in related offerings such as a BSc or minor. It also invited open-ended feedback. The main findings are summarized as follows. Note that due to the scope of the proposal, only results from the most relevant questions are presented here.

Key findings from quantitative data

Initial Interest in the Program (Q3): Out of 534 respondents, a majority expressed positive interest in applying to the BEng in Cybersecurity Engineering program if it became available, with 36% indicating they are 'Very likely' to apply and 22% as 'Likely'. A smaller group, 17%, said they were 'Somewhat likely' to apply, while 22% felt 'Unlikely' to apply. Only 5% were unsure ('Don't know').

Preference Over Current Program (Q5): When considering whether they would have preferred the BEng in Cybersecurity Engineering over their current program, 29% of 533 respondents said 'Very likely', while 25% stated 'Likely'. Additionally, 24% were 'Somewhat likely' to prefer the cybersecurity program, and 20% 'Unlikely'. A minimal 2% did not know.

Relevance to Academic and Professional Goals (Q6): The proposed program objectives seem to align well with students' goals, with 37% finding them 'Very relevant' and a significant 47% finding them 'Relevant'. Only a small fraction of 11% found the objectives 'Not relevant', and 4% were undecided ('Don't know'), out of 532 respondents.

Course Relevance (Q9): Regarding course relevance, a strong majority of the 516 respondents believe the proposed courses are pertinent, with 44% rating them as 'Very relevant' and another 44% as 'Relevant'. Fewer students, 9%, thought the courses were 'Not relevant', and 2% were uncertain ('Don't know').

Program Improvement Suggestions (Q11): Students provided feedback on potential improvements for 499 respondents, with a considerable demand for a 'Co-op option', desired by 67%. 'More hands-on training' was recommended by 53%, while 'Program options or specialization certificates' were sought by 32%. A mandatory co-op was less popular but still notable at 20%, and 5% had other unspecified suggestions.

Interest in BSc (Q12) and Minor (Q14) in Cybersecurity: Students also expressed interest in alternative cybersecurity education paths, including a three-year BSc program and a minor in the field, suggesting a general student interest in cybersecurity education at various levels and commitments.

To conclude, the survey reveals a strong interest in the proposed BEng in Cybersecurity. Considering a response rate of 21% from an unspecified total population, these insights should be weighted accordingly. While the data is indicative of the opinions of those who responded, it may not represent the entire student body's perspective. Nonetheless, the feedback is crucial for the university to consider while finalizing the program details.

Key findings from final comments/questions (Q-15)

Of the 536 respondents, 114 (21%) provided additional comments or questions. Eight common themes were identified across all comments, summarized below with two representative quotes cited for each theme.

1. Interest and Enthusiasm

Many students express a high level of interest in the proposed Cybersecurity program, wishing it had been available sooner. There is excitement about the possibility of specializing in Cybersecurity at the undergraduate level.

- "I would absolutely love to have this program and would definitely start getting my credits for this course."
- "Very cool idea to have this implemented. The future will depend on people who protect people from hackers."

2. Program Structure and Content

Respondents are curious about the structure of the program, the differences between the BEng and BSc options, and the content of the courses. There's a desire for clarity on how the new program aligns with current offerings in related fields.

- "How does the BSc in Cybersecurity differentiate from BEng in Cybersecurity Engineering?"
- "A minor in cyber security would be really good, but will we be able to finish the computer science bachelor program I am currently enrolled in on time if this will be offered next year?"

3. Program Accessibility and Transition

Concerns about the ability to transfer into the Cybersecurity program from other majors are common, with students seeking information about credit transfers and GPA requirements. Flexibility for current students is a priority.

- "Would SOEN students be able to take electives from the Cybersecurity program?"
- "I would hope that there's an option for current computer science or engineering students to transfer into this program during their study if it becomes available."

4. Practical Experience and Employment

Students underscore the importance of including practical experience, such as co-op opportunities, to enhance employability. They also express the need for the curriculum to stay updated with industry standards.

- "A BEng in Cybersecurity is something I would be interested in assuming the job market has enough demand such that 'mandatory coop' is something that can be fulfilled."
- "I love Cybersecurity but without a good background of work experience, no one will offer me a job."

5. Alternatives to a Full Degree

The idea of a minor or certificate in Cybersecurity is well-received, suggesting that students are interested in integrating Cybersecurity education into their current majors without committing to a full degree.

- "A certificate in Cybersecurity is more feasible, and in combination with two additional certificates (to make up a 90-credit degree program) would be highly competitive."
- "Instead of a new program for Cybersecurity, Add cybersecurity courses to Software Engineering and Computer Science electives as a new 'group'."

6. Career Prospects

The relevance of the program to job opportunities and the demand in the job market is a recurring theme, with students weighing the program's potential to enhance their career prospects.

- "Cybersecurity Engineering could really interest students in SCS Concordia and Hack Concordia. Great initiative!"
- "It's a nice idea, but a bit too specialized, would need coop to be considered over comp sci."

7. Teaching Quality

A few comments touch on the importance of having skilled and experienced teachers, suggesting that the success of the program hinges not just on its existence but also on the quality of its delivery.

- "The program itself is good. However, having experienced and skilled teacher plays an important role for the success of every engineering program."
- "It would reflect poorly on Concordia if the curriculum isn't frequently updated and students are not aware of current security standards."

8. Alternative Program Suggestions

A minority of students suggest considering other fields or recommending improvements to current programs before introducing new ones.

- "Add chemical engineering or bioengineering instead!"
- "Focus on improving your engineering program first, before creating a new one. There is a serious academic short-falling at Concordia."

These verbal comments further validated the strong interest in the proposed BEng program or in cybersecurity in general.



Default Question Block

Cybersecurity Engineering Program Survey

Concordia University's Gina Cody School of Engineering and Computer Science would like to get your feedback on a proposed **BEng in Cybersecurity Engineering** program. We are hoping to assess the level of interest in this program among current Concordia students and we invite you to complete a short **5-minute survey**.

Your responses will be held in strict confidence and will only be used to produce aggregate results. The survey will close on November 27.

Your participation will go a long way in informing the development of the program. We greatly appreciate your feedback.

Program Description

The Gina Cody School of Engineering and Computer Science would like to offer a 120-credit **BEng in Cybersecurity Engineering** program. This multidisciplinary initiative is led by the Concordia Institute for Information Systems Engineering (CIISE). The curriculum of the program consists of both fundamental computer science principles and more specialized courses covering all aspects of cybersecurity, including cryptography, operating system security, network security, software security, secure programming, Internet of Things security, blockchain technology, cybersecurity ethics, cybercrime investigations, and privacy.

Program Objectives

The main objective of the program is to prepare students for a rewarding career in the

fast-growing field of Cybersecurity. The program will offer students a comprehensive body of knowledge including cryptography, foundations for secure information systems, access control, security policies and security mechanisms, operating system security, network security, security vulnerabilities and malware defense, secure programming, blockchain technology, cybersecurity ethics, privacy, etc.

The program will also help students develop various cybersecurity skills, including penetration testing skills, risk assessment and security management skills, security engineering skills, security monitoring skills, incident handling and forensic analysis skills, secure network management skills, regulatory compliance, and auditing skills, etc.

Based on this description, how likely is it that you would apply to the BEng in Cybersecurity Engineering program if it became available?

- Very likely
- Likely
- Somewhat likely
- Unlikely
- Don't know

In what year would you most likely expect to apply to the BEng in Cybersecurity Engineering program?

- 2025
- 2026
- Later than 2026
- Don't know
- Would not apply

If the BEng in Cybersecurity Engineering program had been available at the time you applied to Concordia, how likely is it you would have preferred this program to your current one?

- Very likely
- Likely
- Somewhat likely
- Unlikely
- Don't know

How relevant are the proposed program objectives to your academic and professional goals?

- Very relevant
- Relevant
- Not relevant
- Don't know

If you responded "Not relevant" or "Don't know", please explain your choice.

Program Requirements

The proposed BEng in Cybersecurity Engineering is a full-time 120-credit (four-year) program. The curriculum consists of the cybersecurity engineering core courses, engineering courses, technical electives, and general education elective courses.

Cybersecurity Engineering Core Courses

- COMP 232 Mathematics for Computer Science
- COMP 248 Object-Oriented Programming I
- INSE 201 Security Ethics, Laws, Standards & Compliance

- INSE 231 Cryptography I
- COMP 249 Object-Oriented Programming II
- COMP/SOEN 228 System Hardware
- INSE 287 Security Protocols
- COMP 348 Principles of Programming Languages
- COMP 352 Data Structures and Algorithms
- INSE 341 Secure Software Design/Secure programming
- COMP/COEN 346 Operating Systems
- ELEC 275 Principles of Electrical Engineering
- INSE 331 Cryptography II
- COMP 335 Introduction to Theoretical Computer Science
- INSE 342 Operating System Security
- INSE 343 Reverse Engineering, Application and Malware Analysis
- INSE 384 Mobile application privacy and security
- INSE 363 Critical Infrastructure and IoT Security
- INSE 345 Penetration Testing and Ethical Hacking
- INSE 357 Usability and human aspects of security
- INSE 390 Security Engineering Team Design Project
- INSE 321 Cybercrime & Digital Forensics
- INSE 490 Capstone Security Engineering Design Project
- INSE 493 Advanced Topics in Cybersecurity

Engineering Courses

- ENGR 202: Sustainable Development & Environmental Stewardship (1.5 credits)
- ENGR 213: Applied Ordinary Differential Equations (3 credits)
- ENGR 233: Applied Advanced Calculus (3 credits)
- ENGR 301: Engineering Management Principles & Economics (3 credits)
- ENGR 371: Probability and Statistics in Engineering (3 credits)
- ENGR 391: Numerical Methods in Engineering (3 credits)

Technical Electives

- Blockchain Technologies & Applications
- Industrial Control System & Critical Infrastructure Security
- IoT and Embedded System Security
- Quantum Computing & Security
- Security Auditing and Compliance
- Cybersecurity of Healthcare Systems and Devices
- Cybersecurity Management & Governance

Are the proposed courses relevant to your academic and professional goals?

- Very relevant
- Relevant
- Not relevant
- Don't know

If you responded "Not relevant" or "Don't know", please explain your choice.

In what ways do you think this program can be improved? (Please select all that apply.)

- Co-op option available
- More hands-on training
- Program options or specialization certificates available
- Mandatory co-op included in the program
- Other (please specify):

If we also offer a 90-credit (three-year) **BSc in Cybersecurity** program that does not require engineering core courses, how likely is it you would apply to the BSc in Cybersecurity program?

- Very likely
- Likely
- Somewhat likely
- Unlikely
- Don't know

In what year would you most likely expect to apply to the BSc in Cybersecurity?

- 2025
- 2026
- Later than 2026
- Don't know
- Would not apply

If we also offer a 25-credit **Minor in Cybersecurity** program that covers cybersecurity fundamentals, how likely is it you would apply to the Minor in Cybersecurity program?

- Very likely
- Likely
- Somewhat likely
- Unlikely
- Don't know

Final Comments

If you have any final comments or questions regarding the proposed BEng in Cybersecurity Engineering program, please share them below.



Powered by Qualtrics

UNDERGRADUATE PROGRAM IN CYBERSECURITY



Attention,
future
guardians
of the
digital
world!

Are you ready to embark on an exciting journey into the realm of cybersecurity, where you'll **unlock the secrets of protecting the digital universe**? Imagine having the power to **defend against cyber threats**, and dive into the exciting world of ethical hacking, security architecture, and risk management. Now, let's take the first step on this thrilling path together.

The Gina Cody School of Engineering and Computer Science at Concordia University is thrilled to introduce our upcoming undergraduate program in cybersecurity engineering. Our mission is to empower you with the most cutting-edge skills, enabling you to **master the art of protecting critical systems, data**, and infrastructure. With experienced faculty members and experts as your guides, you'll explore the intricate domains of **threat analysis, vulnerability assessment, cryptography**, and **network security**. You'll dive deep into penetration testing, incident response, and secure coding practices. Through hands-on labs and access to the latest tools, you'll be well-prepared to confront the ever-evolving cybersecurity challenges.

Now, we need your valuable input to ensure that our program aligns with your interests and aspirations. Your thoughts matter, and they will shape the future of cybersecurity education.

Please take a moment to complete our survey and share your insights with us. Together, we can forge a path where cybersecurity thrives and where your role as a cybersecurity engineer becomes indispensable. Join us on this exhilarating journey today!

UNDERGRADUATE PROGRAM IN CYBERSECURITY

Current/ Previous Education

- French CEGEP Quebec
- English CEGEP
- Highschool (Canada)
- Highschool (Overseas)
- Other (please specify): _____

Are you currently exploring multiple program options before making your final decision?

Yes No

Have you researched undergraduate programs related to Cybersecurity?

Yes No

On a scale from 1 to 5, how would you rate your current level of interest in cybersecurity? (1 = Not Interested, 5 = Extremely Interested)

(1) (2) (3) (4) (5)

What factors influenced your decision to consider the cybersecurity program or related programs at our university? (Select all that apply)

- Reputation of the program
- Availability of co-op program
- Location of the university
- Course offerings
- Faculty expertise
- Scholarships or financial aid
- Career opportunities in the field
- Other (please specify): _____

Name and email (Optional):

Do you agree that we email you further information about our Cybersecurity program?

Yes No

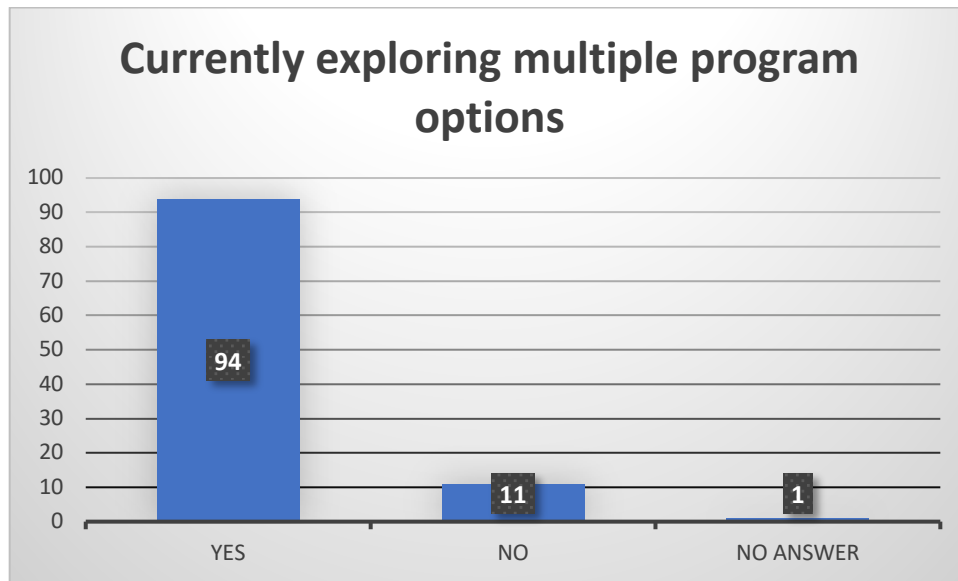
Do you have any additional comments or suggestions related to the cybersecurity program or other programs you are exploring?

106 persons filled the survey.

78/106 (73 %) provided their emails and required more information about the program once it is available.

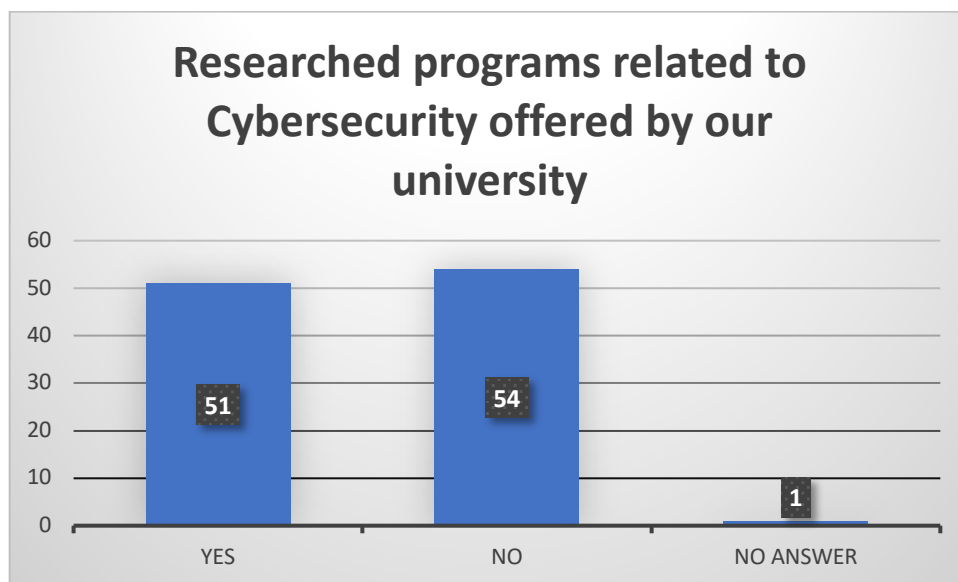
Are you currently exploring multiple program options before making your final decision?

89% are currently exploring different options for their university studies.



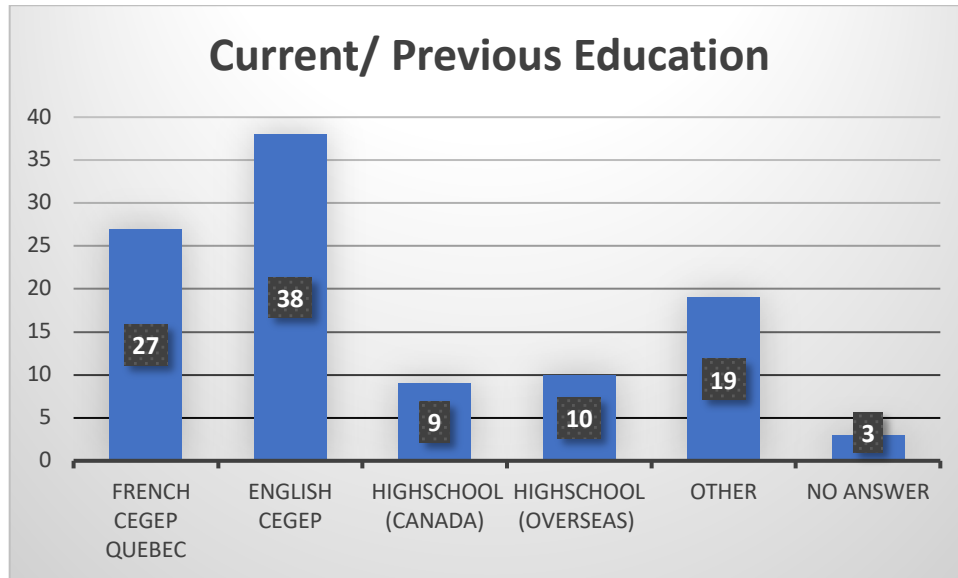
Have you researched programs related to Cybersecurity offered by our university before applying?

Almost 50% looked if the program was offered by Concordia.



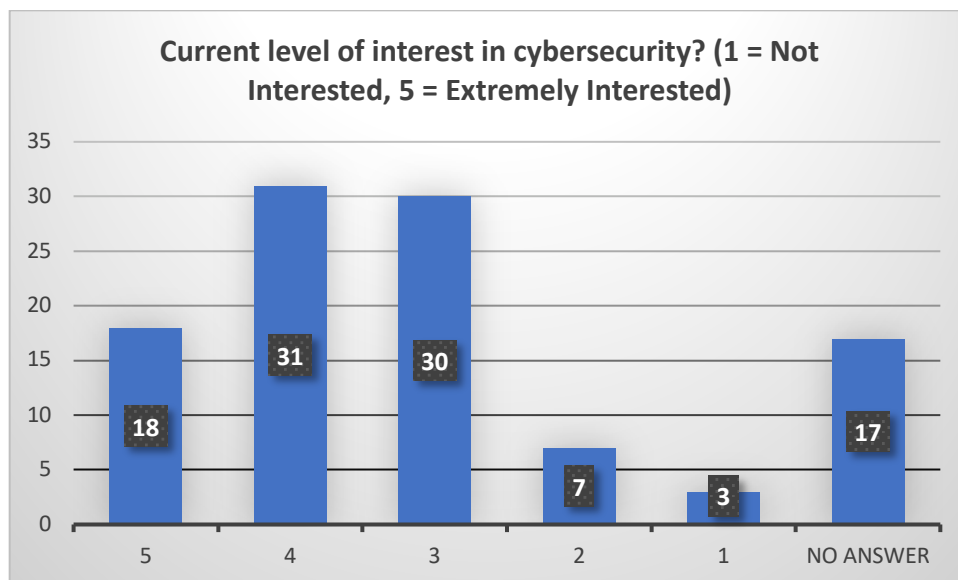
Current/ Previous Education:

65% of the population was mostly CEGEP students (French & English).



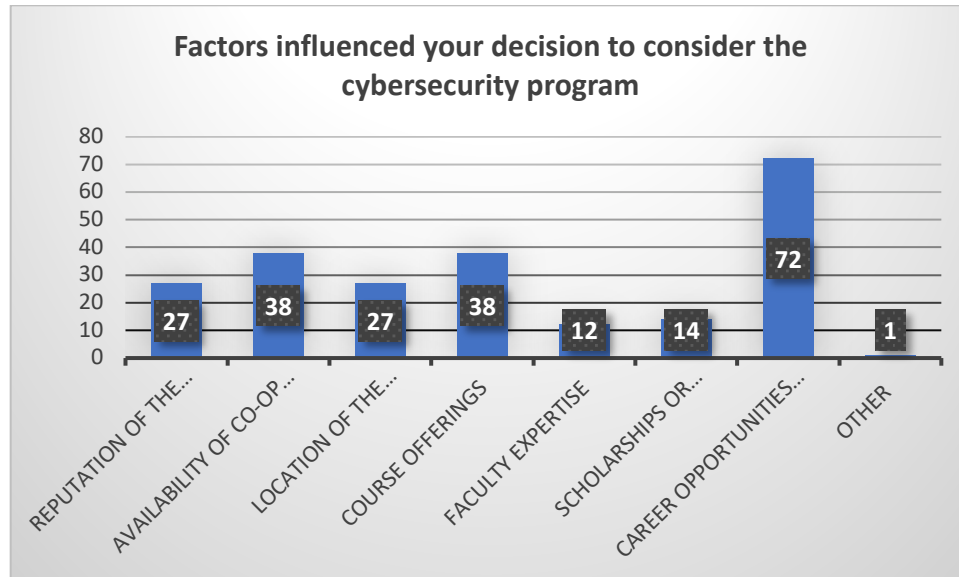
on a scale from 1 to 5, how would you rate your current level of interest in cybersecurity? (1 = Not Interested, 5 = Extremely Interested)

79/106 (74%) showed interest in the program with levels varying between (extreme interest to moderate interest)



What factors influenced your decision to consider the cybersecurity program or related programs at our university? (Select all that apply)

The highest is Career opportunities, availability of a co-op program, and course offerings.

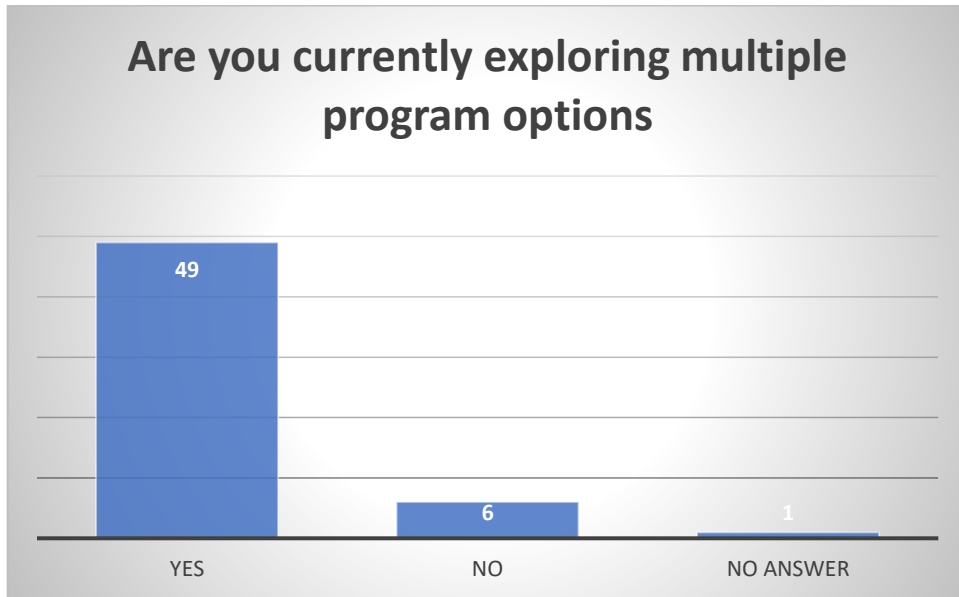


56 persons filled the survey.

43/56 (77 %) provided their emails and required more information about the program once it is available.

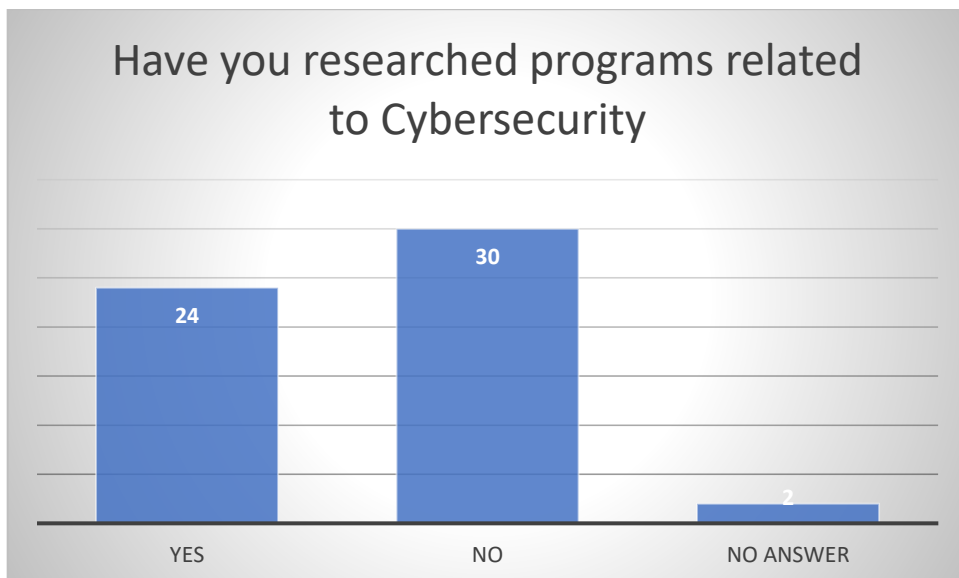
Are you currently exploring multiple program options before making your final decision?

87% are currently exploring different options for their university studies.



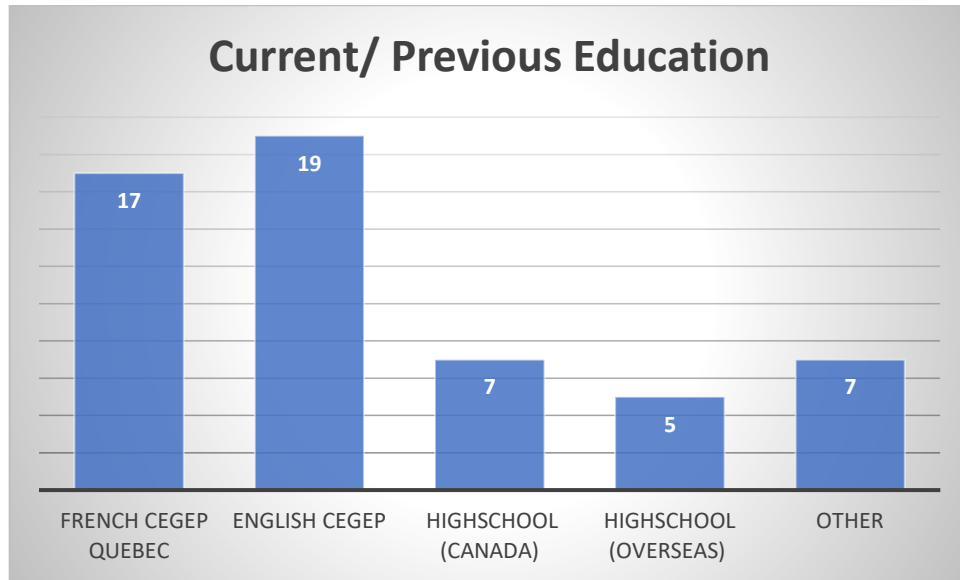
Have you researched programs related to Cybersecurity offered by our university before applying?

Almost 43% looked if the program was offered by Concordia.



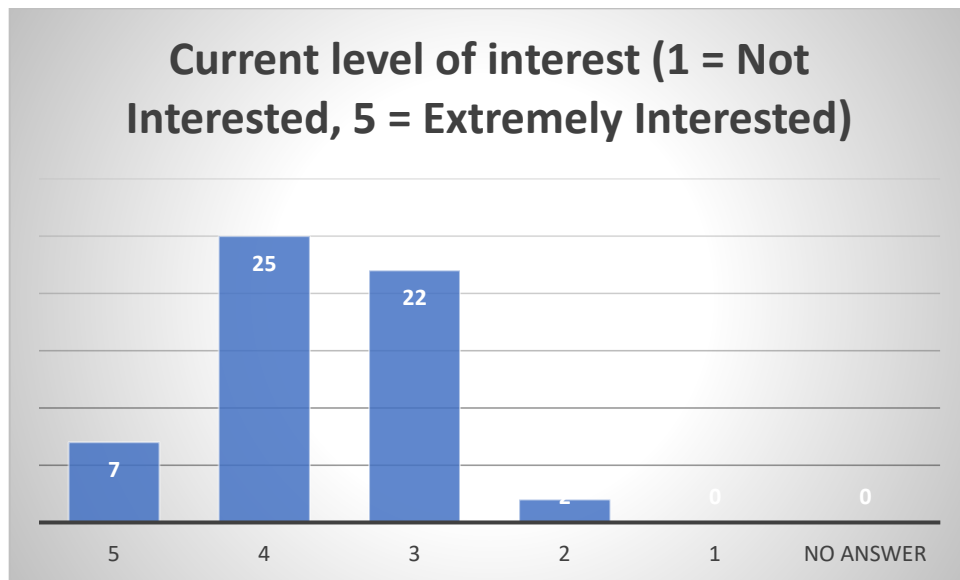
Current/ Previous Education:

64% of the population was mostly CEGEP students (French & English).



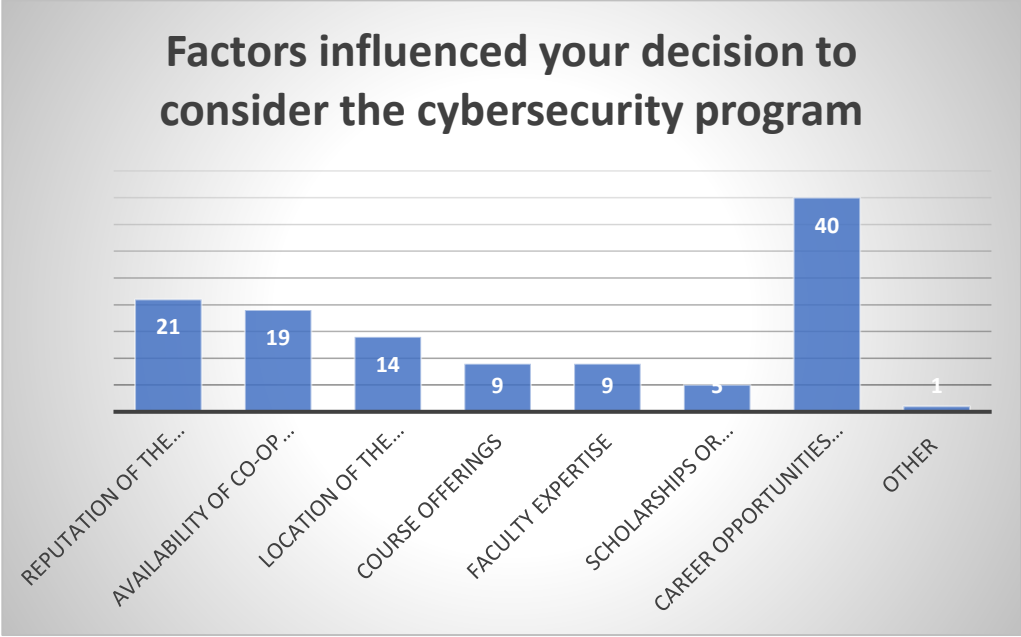
on a scale from 1 to 5, how would you rate your current level of interest in cybersecurity? (1 = Not Interested, 5 = Extremely Interested)

54/56 (96%) showed interest in the program with levels varying between (extreme interest to moderate interest)



What factors influenced your decision to consider the cybersecurity program or related programs at our university? (Select all that apply)

The highest is Career opportunities, availability of a co-op program, and reputation of the program.



Job Posting Analytics

Lightcast Q3 2023 Data Set

February 2024

Parameters

Select Timeframe: Feb 2019 - Jan 2024

Occupations:

Results should include

Code	Description
21220	Cybersecurity specialists

Regions:

Code	Description
01	Canada

Minimum Experience Required: Any

Education Level:

Description
Bachelor's degree

Job Type: Exclude Internships

Part-Time / Full-Time :

Full-time (> 32 hours)

Keyword Search:

Posting Type: Newly Posted

Job Postings Overview

9,913

Unique Postings
20,294 Total Postings

2,245

Employers Competing
252,024 Total Employers

2 : 1

Posting Intensity



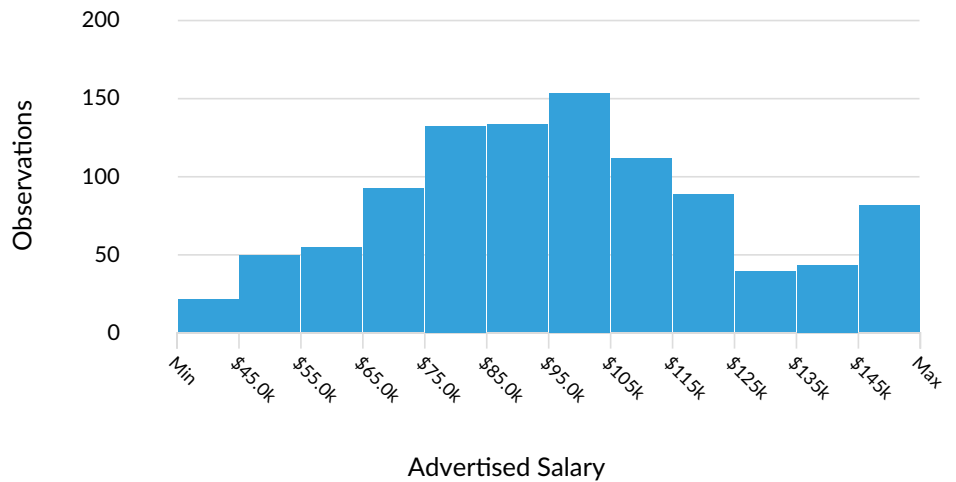
Advertised Salary

There are 996 advertised salary observations (10% of the 9,913 matching postings).

\$95.0K

Median Advertised Salary

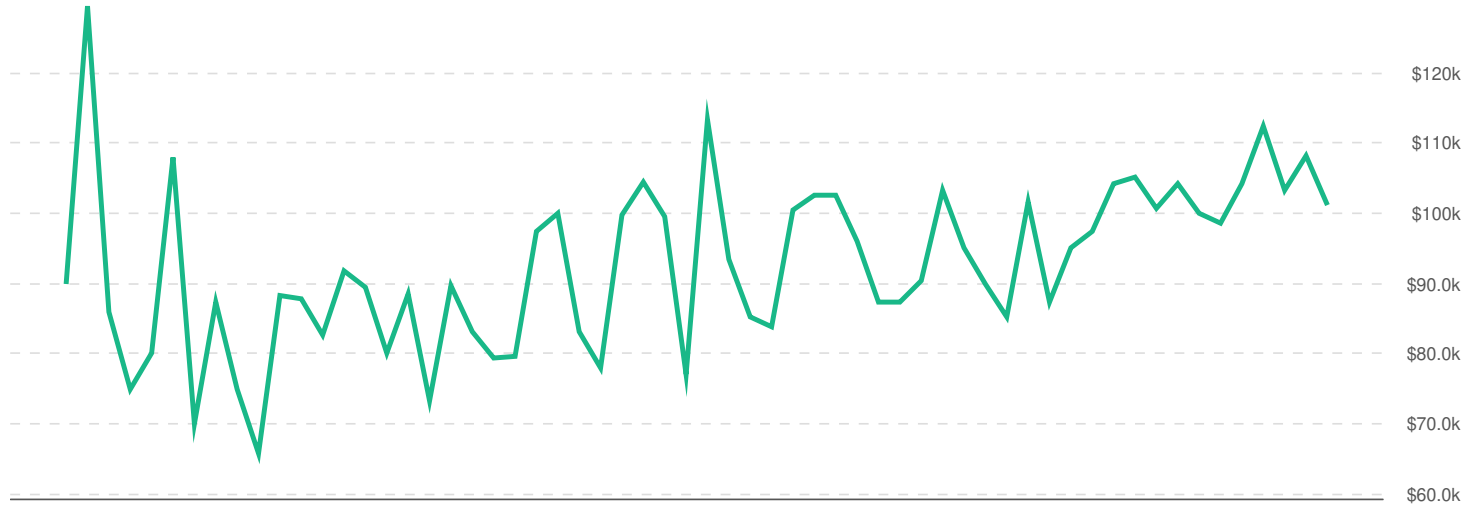
This is \$5.4K above the government recorded median salary for Cybersecurity specialists in Canada.



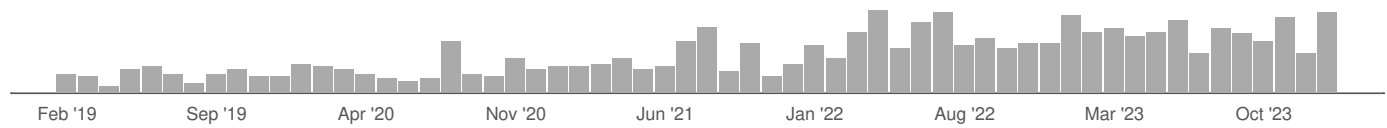
Advertised Wage Trend

▲ 12.5% Feb 2019 - Jan 2024

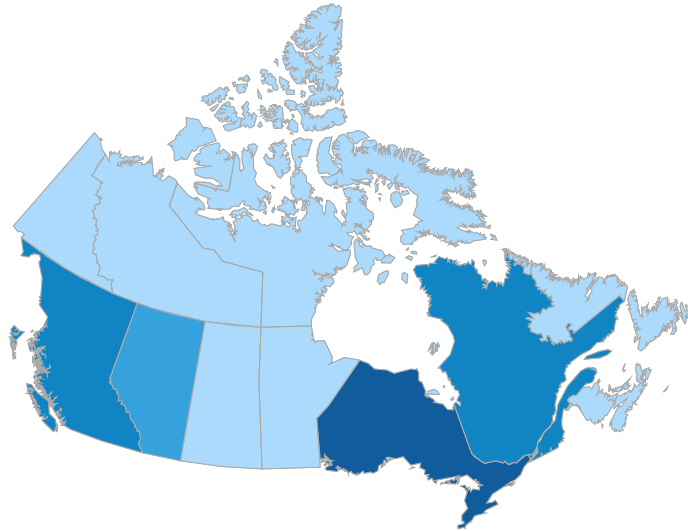
\$95.0k Median



996 Job Postings

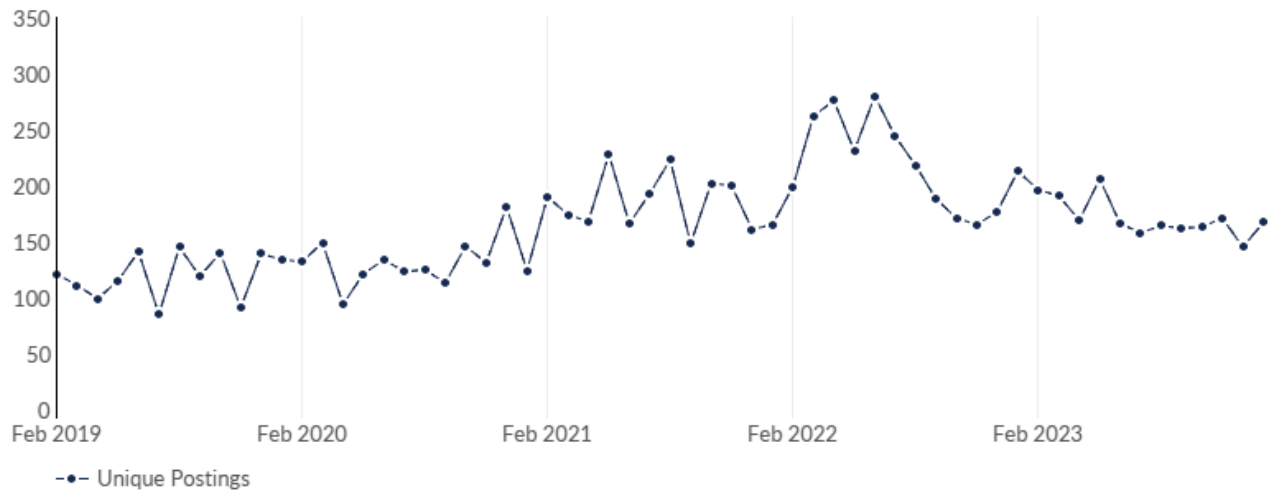


Job Postings Regional Breakdown



Province	Unique Postings (Feb 2019 - Jan 2024)
Ontario	5,854
Quebec	1,268
British Columbia	1,091
Alberta	811
Nova Scotia	243

Unique Postings Trend



Month	Unique Postings	Posting Intensity
Jan 2024	167	2 : 1
Dec 2023	145	2 : 1
Nov 2023	171	2 : 1
Oct 2023	163	2 : 1
Sep 2023	162	2 : 1
Aug 2023	164	2 : 1
Jul 2023	158	2 : 1
Jun 2023	166	2 : 1
May 2023	206	2 : 1
Apr 2023	169	2 : 1
Mar 2023	191	2 : 1
Feb 2023	196	4 : 1

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	0	0%
High school or GED	33	0%
Associate's degree	1,002	10%
Bachelor's degree	9,913	100%
Master's degree	1,368	14%
Ph.D. or professional degree	61	1%





















Minimum Education Breakdown

Minimum Education Level	Unique Postings (minimum)	Unique Postings (max advertised)	% of Total (minimum)
High school or GED	33	0	0%
Associate's degree	992	0	10%
Bachelor's degree	8,888	957	90%
Master's degree	0	1,339	0%
Ph.D. or professional degree	0	61	0%





















Experience Breakdown

Minimum Experience	Unique Postings	% of Total
No Experience Listed	1,916	19%
0 - 1 Years	306	3%
2 - 3 Years	2,152	22%
4 - 6 Years	3,437	35%
7 - 9 Years	1,200	12%
10+ Years	902	9%



Top Companies Posting

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
TD Bank	1,004 / 425	2 : 1 	
Procom	692 / 264	3 : 1 	
Bell	426 / 227	2 : 1 	
TELUS	403 / 221	2 : 1 	
Deloitte	518 / 201	3 : 1 	
Ernst & Young	373 / 177	2 : 1 	
Scotiabank & Trust	394 / 151	3 : 1 	
Tundra Technical Solutions	148 / 134	1 : 1 	
BMO Harris Bank	218 / 124	2 : 1 	
Manulife	156 / 100	2 : 1 	



Top Cities Posting

City	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Toronto, Toronto County	7,293 / 3,530	2 : 1 	
Montreal, Montreal County	1,555 / 982	2 : 1 	
Ottawa, Ottawa County	1,171 / 603	2 : 1 	
Calgary, Division No. 6 County	1,130 / 598	2 : 1 	
Vancouver, Greater Vancouver County	1,028 / 571	2 : 1 	
Mississauga, Peel County	820 / 471	2 : 1 	
Halifax, Halifax County	529 / 203	3 : 1 	
Waterloo, Waterloo County	317 / 192	2 : 1 	
Winnipeg, Division No. 11 County	488 / 188	3 : 1 	
Edmonton, Division No. 11 County	320 / 175	2 : 1 	





















Top Posted Occupations

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Cybersecurity specialists	20,294 / 9,913	2 : 1 	





















Top Posted Occupations

Occupation	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Cyber / Information Security Engineer / Analyst	20,294 / 9,913	2 : 1 	

Top Posted Job Titles

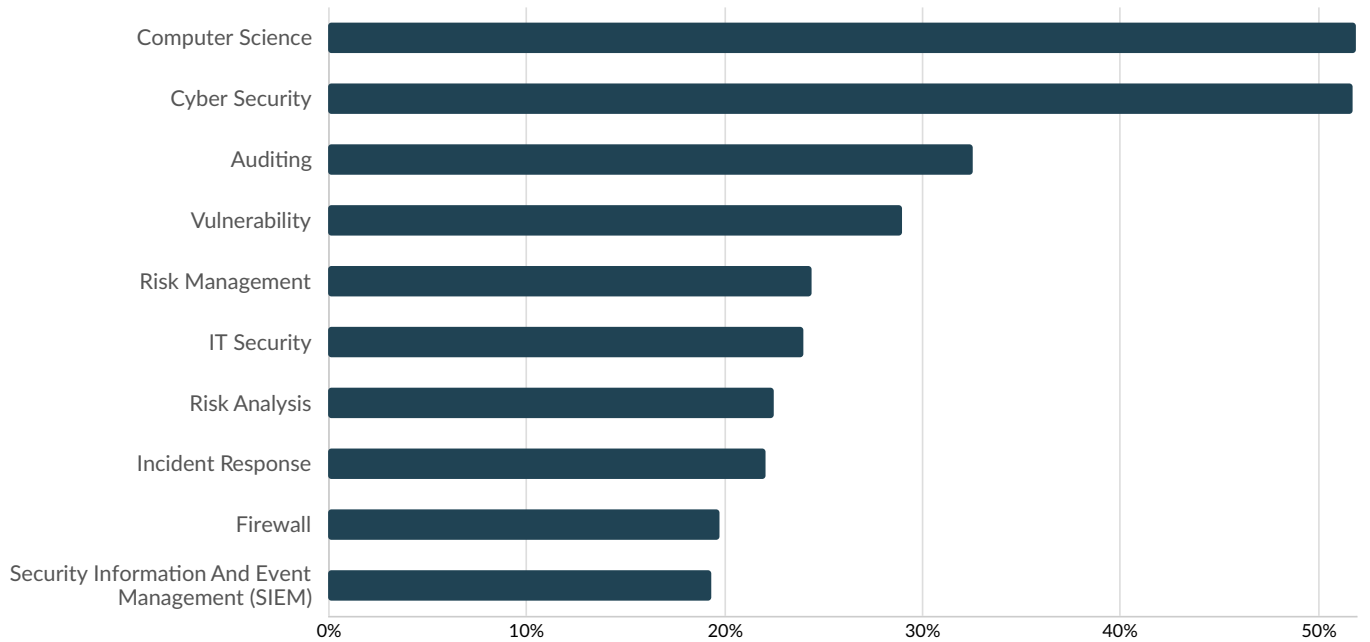
	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Information Security Analysts	1,273 / 535	2 : 1 	
Cybersecurity Analysts	995 / 484	2 : 1 	
Cybersecurity Specialists	879 / 402	2 : 1 	
Cybersecurity Managers	572 / 299	2 : 1 	
Information Security Specialists	724 / 272	3 : 1 	
Information Security Managers	441 / 239	2 : 1 	
Cybersecurity Consultants	342 / 198	2 : 1 	
IT Security Analysts	292 / 185	2 : 1 	
Security Analysts	277 / 171	2 : 1 	
Technology Risk Managers	301 / 154	2 : 1 	

Top Industries

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Commercial Banking	2,189 / 969	2 : 1 	
Employment Placement Agencies	1,253 / 544	2 : 1 	
Administrative Management and General Management Consulting Services	1,053 / 374	3 : 1 	
Offices of Certified Public Accountants	718 / 315	2 : 1 	
Software Publishers	505 / 313	2 : 1 	
Direct Life Insurance Carriers	558 / 242	2 : 1 	
Wired Telecommunications Carriers	448 / 241	2 : 1 	
Temporary Help Services	300 / 238	1 : 1 	
Telephone Answering Services	403 / 221	2 : 1 	
Engineering Services	372 / 210	2 : 1 	

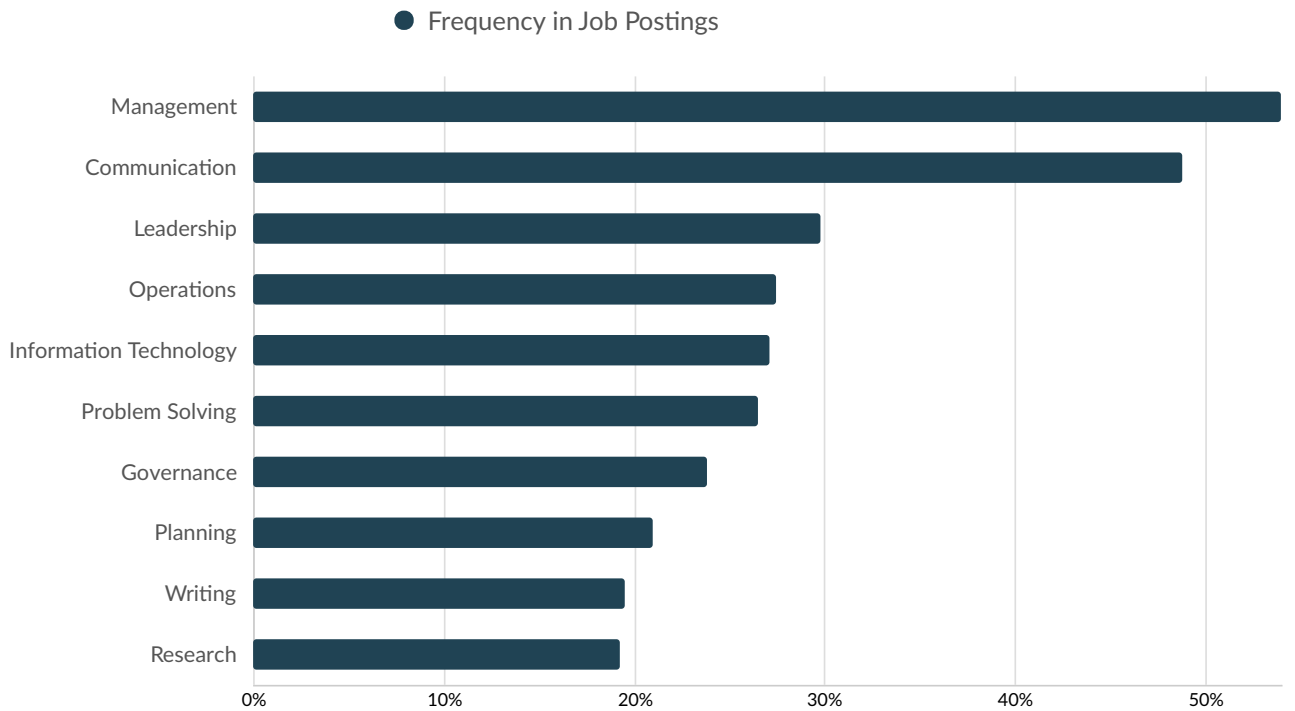
Top Specialized Skills

● Frequency in Job Postings



	Postings	% of Total Postings
Computer Science	5,148	52%
Cyber Security	5,133	52%
Auditing	3,226	33%
Vulnerability	2,871	29%
Risk Management	2,424	24%
IT Security	2,379	24%
Risk Analysis	2,229	22%
Incident Response	2,195	22%
Firewall	1,964	20%
Security Information And Event Management (SIEM)	1,922	19%

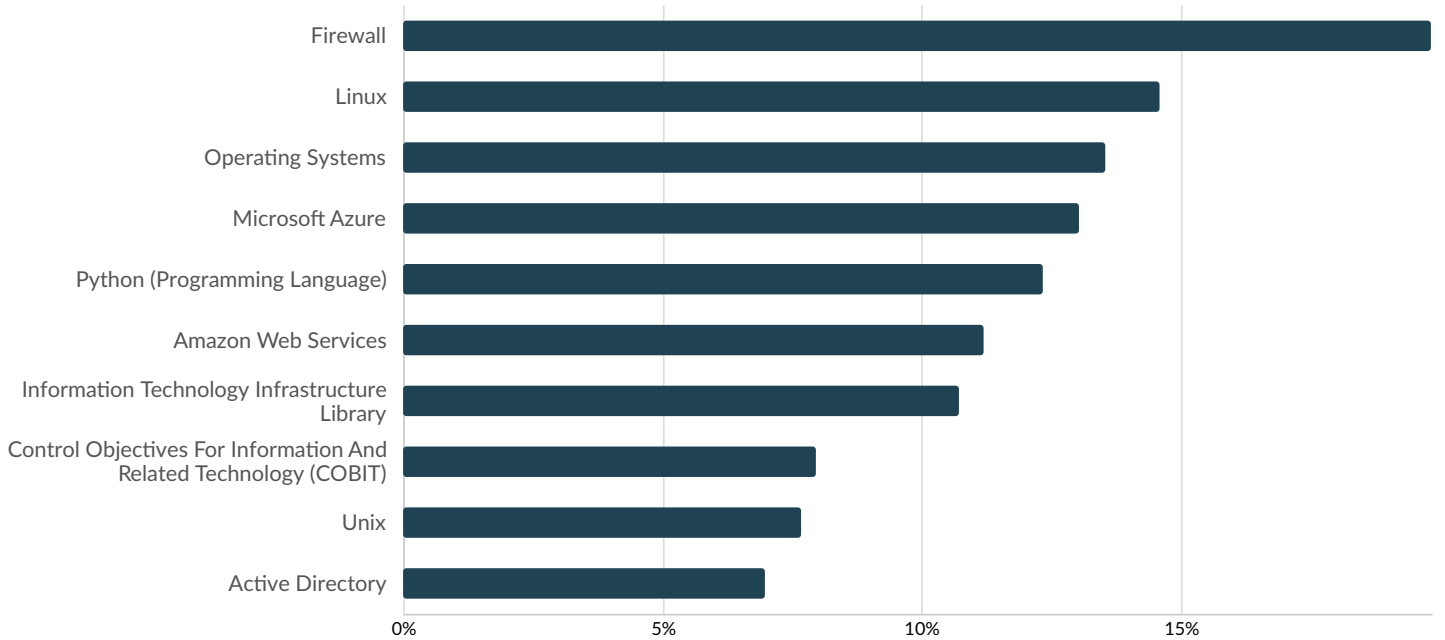
Top Common Skills



	Postings	% of Total Postings
Management	5,349	54%
Communication	4,838	49%
Leadership	2,955	30%
Operations	2,722	27%
Information Technology	2,691	27%
Problem Solving	2,629	27%
Governance	2,360	24%
Planning	2,078	21%
Writing	1,936	20%
Research	1,912	19%

Top Software Skills

● Frequency in Job Postings



	Postings	% of Total Postings
Firewall	1,964	20%
Linux	1,444	15%
Operating Systems	1,342	14%
Microsoft Azure	1,291	13%
Python (Programming Language)	1,222	12%
Amazon Web Services	1,109	11%
Information Technology Infrastructure Library	1,061	11%
Control Objectives For Information And Related Technology (COBIT)	789	8%
Unix	759	8%
Active Directory	692	7%

Top Qualifications

	Postings with Qualification
Certified Information Systems Security Professional	4,432
Certified Information Security Manager	2,261
Certified Information System Auditor (CISA)	2,018
GIAC Certifications	1,608
Certified In Risk And Information Systems Control	901
Certified Ethical Hacker	884
Offensive Security Certified Professional	692
NIST Cybersecurity Framework (CSF)	656
Certified Cloud Security Professional (CCSP)	650
CompTIA Security+	517

Appendix A

Top Posting Sources

Website	Postings on Website (Feb 2019 - Jan 2024)
indeed.com	2,103
careerjet.ca	902
workopolis.com	855
myworkdayjobs.com	850
jobs.ca	752
taleo.net	431
careerbuilder.ca	335
option-carriere.ca	320
icims.com	298
theitjob.com	292
td.com	266
glassdoor.ca	248
brassring.com	237
careerbeacon.com	172
energyjobline.com	171
bce.ca	170
localwork.ca	159
scotiabank.com	140
telus.com	132
talentnet.community	122
jobillico.com	120
deloitte.ca	108
ultipro.ca	105
simplyhired.ca	102
jobvite.com	96

Appendix B

Sample Postings

Sr. Specialist (W/m/x) Cybersecurity

Link to Live Job Posting: www.jobs.ca

Location: Aurora, York County

Company: Magna Powertrain

Job Title: Cybersecurity Specialists

About us We see a future where everyone can live and move without limitations. That's why we are developing technologies, systems and concepts that make vehicles safer and cleaner, while serving our communities, the planet and, above all, people. Forward. For all. Group Summary Transforming mobility. Making automotive technology that is smarter, cleaner, safer and lighter. That's what we're passionate about at Magna Powertrain, and we do it by creating world-class powertrain systems. We are a premier supplier for the global automotive industry with full capabilities in design, development, testing and manufacturing of complex powertrain systems. Our name stands for quality, environmental consciousness, and safety. Innovation is what drives us and we drive innovation. Dream big and create the future of mobility at Magna Powertrain. About the Role The role of the Sr. Specialist (w/m/x) Cybersecurity is to ensure that all Cybersecurity requirements and protocols are effectively implemented across all locations. Your Responsibilities Serve as Cybersecurity leader in Magna Powertrain (MPT) for the delivery of Security Programs Leads implementation, support, tracking and compliance enforcement of Corporate and MPT Cybersecurity programs Provides guidance, expert advice, and assesses risk associated with the security architecture of new IT, Business and Product initiatives as it relates to Information Security Define the Group template and structure for Security Standards and Procedures Develops methods and processes for Cybersecurity to ensure confidentiality, integrity and availability for all 3 domains Design standardized security processes and associated procedures to be implemented across MPT Divisions Who we are looking for Bachelors of Science degree in Computer Science, Engineering, Computer Security, Information Systems, or equivalent proof of baseline knowledge. Strong knowledge of various frameworks/regulations such as

ISO 27001/2, TISAX, NIST 800-53, NIST

Cybersecurity Framework, GDPR, SOX, ITIL, COBIT, COSO or similar. relevant professional experience years of multi-domain security experience, Security, or IT management Accredited certifications a plus, such as:

CISM, CISSP, OSCP, GCIH

(Certified Incident Handler) GCIA (Certified Intrusion Analyst) CEH (Certified Ethical Hacker) CCNA (Cisco Certified Network Associate) Your preferred qualifications Experience documenting cybersecurity and IT policies, standards and procedures. Proven record of project execution in a global company with dispersed operations. Experienced in cloud networking architecture and cloud operations experience preferred. Previous

SOC / NOC

experience a plus very good written and spoken English skills What we offer At Magna, you can expect an engaging and dynamic environment where you can help to develop industry-leading automotive technologies. We invest in our employees, providing them with the support and resources they need to succeed. As a member of our global team, you can expect exciting, varied responsibilities as well as a wide range of development prospects. Because we believe that your career path should be as unique as you are. Site Benefits Work-life balance: flexible working time models, trust-based working hours, mobile working Health management: attractive offers to promote health (e.g. company sports groups, free fruit, water stations and company doctor), preventive health check-ups, flu vaccinations, health action days Training and development: structured induction, extensive learning and development opportunities, talent programs, participation in idea management Working environment: modern and ergonomically designed workstations with quiet and communication zones, canteen with regional food and live cooking station Awareness. Unity. Empowerment. At Magna, we believe that a diverse workforce is critical to our success. That's why we are proud to be an equal opportunity employer. We hire on the basis of experience and qualifications, and in consideration of job requirements, regardless of, in particular, color, ancestry, religion, gender, origin, sexual orientation, age, citizenship, marital status, disability or gender identity. Magna takes the privacy of your personal information seriously. We discourage you from sending applications via email to comply with GDPR requirements and your local Data Privacy Law.

Summer Student - IT Security (4-month Term)

Link to Live Job Posting: www.jobs.ca

Location: Calgary, Division No. 6 County

Company: Parkland Health

Job Title: Unclassified

Position Title:

Summer Student - IT Security (4-Month Term)

Team and Location:

IT Security - Calgary At Parkland, our purpose is to Power Journeys & Energize Communities. We are a prominent independent supplier and marketer of fuel and petroleum products and a leading convenience store operator. As One Parkland team, we proudly serve diverse retail, commercial and wholesale customers across Canada, the United States, the Caribbean region, and South America. We power a growing family of locally known brands including Fas Gas Plus, Pioneer, RaceTrac, Superpumper, Ultramar, Chevron, Esso, ON the RUN, Bluewave Energy, Pipeline, Columbia Fuels, Island Petroleum, and Sparlings Propane. We recognize that diversity gives us an edge and inclusion propels us forward. We're also a passionate team of down-to-earth achievers, committed to getting our customers, colleagues and communities further, faster. As such, we welcome talented individuals that have a variety of perspectives, backgrounds, and industry experience who will contribute to the success of our One Parkland team. At Parkland we believe students entering the workplace are the very people who will shape the industry and our future direction. If you are a highly energetic student with initiative and drive, you'll be given the opportunity to learn, gain valuable work experience, work with a great team, and learn about the wide range of departments & functions involved in a large, forward-thinking corporation.

Position Summary:

The IT Summer Student is responsible for providing exceptional support to our IT Security team of Parkland, for the 4-month term. As a member of the IT Security team, you will assist with the day-to-day activities that include installing and troubleshooting various security solutions for the organization. The Summer student will be working closely with the IT Security team to efficiently understand Parkland's information system security and compliance requirements to establish good priorities in security initiatives. Parkland's internship program in cybersecurity is designed to provide a solid foundation of knowledge, experience, and training while giving the students the opportunity to apply what they are learning in school to a real-world setting.

Key Responsibilities:

Monitor and action daily security issues and events generated by our security tools. Operate security technologies to protect systems and information infrastructure. Assist with security incident management and look back reviews. Learn and exercise the knowledge in real time.

Qualifications and Skills:

You are available for a 4-month term beginning on or around May of 2024. You are currently enrolled at a Canadian post-secondary institution working towards a bachelor's degree with a focus on Information Systems, Computer Science, Engineering, or a related discipline. You have exceptional interpersonal skills and possess natural leadership as demonstrated in academic and/or extracurricular activities. You have highly developed verbal and written communication skills to enable you to thrive in a challenging and exciting work environment. You are a creative and analytical thinker with some project management skills who is self-driven and capable of working in a fast-paced environment. You have tenacity and an entrepreneurial spirit, and are passionate about seeking out win-win solutions. You have strong MS Office skills including Word, Outlook, Excel and PowerPoint. You will be part of a global team and must be able to work effectively through a high degree of collaboration and communication through in-person meetings and video conferences. We thank all candidates in advance for their interest, however only those being considered will be contacted. This position will close when a successful candidate is found. Please note, that candidates must be legally able to work in Canada at this time. Parkland regrets that it is unable to sponsor employment Visas. Parkland Corporation is committed to the principles of Employment Equity. We strive to provide accessibility in employment to ensure equal access to employment opportunities for candidates, including persons with disabilities. Parkland Corporation will endeavor to provide accommodation to persons with disabilities in the recruitment process upon request. If you are selected for an interview and you require accommodation due to a disability, please notify us upon scheduling your interview.

Information Security Awareness Training Analyst

Link to Live Job Posting: www.workopolis.com

Location: Calgary, Division No. 6 County

Company: Insync

Job Title: Information Security Analysts

Information Security Awareness Training Analyst Calgary, AB Contract, Fixed term contract Job details Heres how the job details align with your . Job type matching qualification Contract matching qualification Fixed term contract Shift and schedule matching qualification 8 hour shift Location Calgary, AB We are looking for an Information Security Awareness Training Analyst for a 6-month contract position , with possible extensions in Calgary, Alberta. Must be legally entitled to work in Canada. Hybrid schedule, at least 4 days in the office. 8 hours a day, 40 hours a week. It is NOT a remote role. Role summary The role of the Information Security Awareness Training Analyst is to assist in the creation of materials, events, and content which inform, excite, and engage an internal audience. This role specifically focuses on cybersecurity-related content which helps protect the company from a variety of threat actors. Our client is looking for someone who shares their passion for information security and helping our staff stay safer online, a team player who loves to collaborate, a curious and creative mind that enjoys learning. This position reports to a Cyber Security Specialist within the Information & Cyber Security management team.

Travel Requirements:

Minimal travel may be required. Responsibilities You will support the pre-defined awareness program, completing task and producing content as to implement security awareness and training initiatives to reach target audiences through appropriate channels (digital media, print media, training, events, etc.). You will support the collection of feedback, comments, suggestions, and impressions from all employees, as engaged in the various awareness and training activities, for the evolution and improvement of Cyber Culture initiatives. You will measure and evaluate the impact/effectiveness and comprehensiveness of awareness and training initiatives, through dashboards, KPI reports and results collection. ALT wording - Measure and report key performance indicators around security awareness. You will support the organization and planning of new training and awareness initiatives based on the collection of needs, criticalities, or chances for growth, discovered among the employees and through our Information & Cyber security team. You will support the development of tailored cybersecurity role-based/personas, learning paths, design courses that are foundational to desired secure behaviors in compliance with enterprise policies, procedures and standards. You will support configure, deploy, maintain, and support security awareness toolsets. Ensure all regulatory and compliance requirements for security awareness are met. Extend this beyond regulations to drive behavioral change and inspire a security culture within our company. Identify and collaborate with security champions to broaden the security reach within lines of business across the company Be accountable to engage subject matter experts for content and material accordingly for awareness newsletters, activities, and websites Participate and contribute to projects related to cybersecurity awareness including business initiative and complete assigned tasks through projects development, integration, and implementation Create and assist with innovative security awareness campaigns using solution provider and custom -developed tools designed to be flexible and adaptable across a globally diverse employee population (e.g. developers, executives, operations etc) Be able to organize the activities for cybersecurity awareness specific global dates (e.g. October Cyber Security Awareness Month, Data Privacy Week, Infrastructure Security Month) by researching speakers, games, quizzes, and reward activities as directed, provide solutions and result of the speaker events, games, and quizzes Assist in promoting and administering cybersecurity awareness learning related initiatives, tasks, and activities using written, audio and visual mediums. Assist in providing worldwide customer support, problem identification and resolutions in cybersecurity awareness related activities: such as newsletters, awareness campaigns, etc. Report on metrics of participation and effectiveness Experience and Qualifications Bachelors degree in (Corporate/Persuasive) Communication, Security Studies, Crisis Management, Behavioral Science/Psychology, Information Technology, or a related field. Typically, 2+ years relevant work experience in one or more of the following fields: technical, security or privacy education/training, information security, risk management, communications, or other related fields. Experience building information security and/or privacy education and awareness training initiatives, preferably in a large enterprise. Experience running and supporting simulation-based training campaigns such as phishing and voice elicitation

a plus. Professional certifications are considered a plus (e.g.

ISC2 CISSP

Certified Information Systems Security Professional;

PMI-ACP:

PMI Agile Certified Practitioner;

SANS SSAP

Sans Security Awareness Professional Fluent in written and spoken English; any other language skill is considered a plus. Be able to assist in response to business units or regional cybersecurity awareness requests Ability to manage multiple initiatives while adhering to strict deadlines Excellent verbal/written communication, analytical and independent judgment skills with ability to effectively interact with individuals at all levels of responsibility; must be able to positively influence and clearly explain complex information security concepts and technologies for both technical and non-technical audiences. Excellent relationship-building and influencing skills in all mediums and throughout all levels of the organization. Experience in developing and executing gamification or interactive learning (e.g. phish simulations, escape rooms) a plus Basic understanding of adult learning and organizational change principles and theories, such as experiential learning, and self-directed learning a plus. Strong understanding of the relationship between human behavior and security a plus General knowledge of Cybersecurity international standards, law and regulations (e.g.

NIST, ISO27000

). General Knowledge of main IT and OT (Operational Technology) cybersecurity topics, as to tailor awareness, communication and training material for the Group or specific populations. General knowledge of the communication activities to be put in place as to further enhance the response to cybersecurity incidents. Have some knowledge or experience with cybersecurity and be able to articulate its risk and impact in providing customer support, problem identification and resolutions Please note that while all applications are appreciated, only candidates selected for interview will be contacted. InSync Systems Inc. is a privately-owned boutique Canadian Resourcing and Consulting Services Company that works closely with a range of corporate clients across multiple industries to bring them solutions that effectively address their business needs.

Cybersecurity Analysts – Unclassified in Halifax, Halifax County (Jan 2024 - Active)

Cyber Security Analyst Student - Summer 2024 Co-op

Link to Live Job Posting: www.adzuna.ca

Location: Halifax, Halifax County

Company: Unclassified

Job Title: Cybersecurity Analysts

Co-op Location:

Dartmouth

Company:

JD Irving IT Cyber Security Analyst Location:

Halifax, NS Are you excited about the internet of things, data, mobility & innovative solutions while always focused on the delivery of the customer experience? Are you looking for a job which enables you to work with a team of industry-leading professionals? Do you want to gain hands-on experience that could lead to full-time employment upon graduation? Does a job with real responsibilities and making meaningful contributions interest you? Then please, keep reading! We are J.D. Irving Limited & our Information Technology team works with the latest and greatest technology. We are the destination of choice for curious, energetic & collaborative people! With over 350 employees centralized in Saint John, Dieppe, Fredericton, and Halifax, we offer our people the opportunity to add business value to our organization while enjoying the friendly and naturally beautiful lifestyle that only the Maritimes can offer. We invest in continuous professional growth through strong career development programs. With your professional growth as our focus! Come join us and work among the best in the Maritimes! We have a student opportunity! The Co-op Student will work with a dynamic team of IT professionals within JDI IT in Saint John, NB. The successful candidate will be given increasingly challenging assignments to analyze business requests and implement solutions. During the term the Co-op Student will gain exciting experience with a variety of leading-edge technologies in the field of IT Security.

Qualifications:

Education Required:

Enrolled and in good academic standing in Bachelor of Computer Science, Software Engineering, Computer Engineering, or Information Systems

Years of Experience Required:

flexible Positive can-do attitude with an interest in technology High energy Team player Attention to detail All successful applicants must meet requirements for Canadian Controlled Goods Program (CGP), Canadian Government Security clearance, and U.S. International Traffic in Arms Regulations (ITAR). What Will You Learn? Hands on experience with IT Security Opportunity to work on projects and changes supporting multiple lines of business Hands on and practical experience in management of IT security tools and activities including but not limited to: Phishing Tests Data Loss Investigations Incident Handling Security Analytics and Reporting Security Access Requests We have a robust student program at J.D. Irving with formal and informal opportunities to meet and network with people from all across the business, including other students. This is a great experience that will provide you with a challenging, valuable work experience in addition to having the opportunity to work in one of the largest IT employers in Atlantic Canada. To Apply for this

Career Opportunity:

Please apply online and be sure to include a cover letter telling us a bit about yourself and clearly outlining your areas of interest. We would also ask that you include a copy of your academic transcript. We appreciate your interest in our company! The initial review of applications will begin on the deadline date for applying. Applications received after the deadline may not be considered. Only those candidates selected for an interview will be contacted. J.D. Irving, Limited is committed to the principle of equal opportunity in its employment practices and to providing an environment free from discrimination and harassment for all employees.

Additional Information Posting Date:

Jan 19, 2024

Cybersecurity Architect	
Link to Live Job Posting: www.adzuna.ca	
Location: Halifax, Halifax County	Company: Pratt & Whitney
Job Title: Cybersecurity Architects	
<p>Cybersecurity Architect Location:</p> <p>Grand Lake</p> <p>Company:</p> <p>RTX Corporation Date Posted:</p> <p>2024-01-05</p> <p>Country:</p> <p>Canada Location:</p> <p>LOC13056 189</p> <p>Pratt & Whitney Drive Aerotech Business Park,Enfield,Nova Scotia,B2T 1L1,</p> <p>Canada Position Role Type:</p> <p>Unspecified Who we are At Pratt & Whitney, we believe that powered flight has transformed</p> <ul style="list-style-type: none"> • and will continue to transform • the world. That's why we work with an explorer's heart and a perfectionist's grit to design, build, and service the world's most advanced aircraft engines. We do this across a diverse portfolio • including Commercial Engines, Military Engines, Business Aviation, General Aviation, Regional Aviation, and Helicopter Aviation • and as a way of turning possibilities into realities for our customers. <p>This is how we at Pratt & Whitney approach our work, and this is why we are inspired to go beyond. Our expectations Pratt & Whitney is seeking an experienced cyber security professional to join our Global Cyber Security Architecture and Assessment Team. The Security Architect will be responsible for delivering comprehensive security architecture assessment and guidance to ensure both protection by design and cyber compliance for Pratt & Whitney Canada (P&WC). The preferred candidate will be responsible for providing technical security expertise in security architecture and deployment of enterprise systems while ensuring compliance to enterprise policies, industry standards and regulatory requirements. In addition, as a core member of the P&W Cybersecurity team, the candidate will contribute to evaluation of new technologies that support current and future P&W business needs. The position will also require program/project management and oversight of Cybersecurity related projects to include Authority to Operate (ATO) to ensure that they meet business and security requirements in a timely and cost effective manner. The ideal candidate will have practical security understanding with the ability to build and refine capability to deliver secure repeatable solutions for P&W. What your day to day will look like? Provide program level oversight to P&WC security architecture that can be leveraged at corporate and partner business unit levels. Provide oversight of the analysis, requirement development, design, documentation, implementation, and maintenance of complex IT architecture solutions. Estimate costs and schedules and recommend resources required and solutions to problems. Leverage and optimize existing corporate solutions to drive</p>	

standardization and simplification to reduce implementation timelines and costs. Participate as Cybersecurity lead on all P&WC DT initiatives. Understand technical security issues and the implications to the business. Be able to build processes and integrate distributed workflows into consolidated and centralized processes. Interface and collaborate with internal and external partner organizations. Continuously assess and align core processes with strategic Security and Technology direction. The tools you need to be successful Education Bachelor's degree or higher

Technical Certifications:

CISSP, Security+, CSSLP, CEH, OSWE, GREM or equivalent are highly desired but not required.

Professional Certifications:

ITIL, Agile, PMP or equivalent are a plus but not required.

Experience / Qualifications

At least 6-10 years of experience with technical program management, capability development, security/solution architecture and process engineering. Practical experience in developing and interpreting technical diagrams and roadmaps that ensure that our technology meets all security requirements and anticipates future scale and ROI opportunities. Proven experience in secure architecture design and implementation for public and private offerings. Demonstrated ability to articulate effective security principles and controls (SANS, NIST, CIS, etc.) with proven experience applying in context to risk.

Strong ability to communicate:

write clearly and speak authoritatively to different kinds of audiences (customers, technical SME's, and business leaders). Experience defining, implementing, and complying with IT policies, procedures, and standards. Strong interpersonal and communication skills, and experience speaking authoritatively to different kinds of audiences (customers, technical SME's, and business leaders). Experience with metrics development and trending analysis for process improvement. Diversity, Equity & Inclusion The masculine pronoun is used without discrimination and solely for the purpose of making the text easier to read. P&WC is an equal opportunities employer, seeking to promote diversity and inclusion. We will consider applications from all qualified candidates, regardless of their race, colour, religion, sexual orientation, gender, nationality, age, disability, veteran status or any other status protected by law. RTX is An Equal Opportunity/Affirmative Action Employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability or veteran status, age or any other federally protected class.

Privacy Policy and Terms:

Click on this link to read the Policy and Terms

Appendix C - Data Sources and Calculations

Lightcast Job Postings

Job postings are collected from various sources and processed/enriched to provide information such as standardized company name, occupation, skills, and geography.

Job Posting Analytics

Lightcast Q3 2023 Data Set

February 2024

1455 Boulevard de Maisonneuve O

Parameters

Select Timeframe: Feb 2019 - Jan 2024

Occupations:

Results should include

Code	Description
21220	Cybersecurity specialists

Regions:

Code	Description
24	Quebec

Minimum Experience Required: Any

Education Level:

Description
Bachelor's degree

Job Type: Exclude Internships

Part-Time / Full-Time :

Full-time (> 32 hours)

Keyword Search:

Posting Type: Newly Posted

Job Postings Overview

1,268

Unique Postings
2,072 Total Postings

252

Employers Competing
77,717 Total Employers

2 : 1

Posting Intensity
Regional Average: 2 : 1

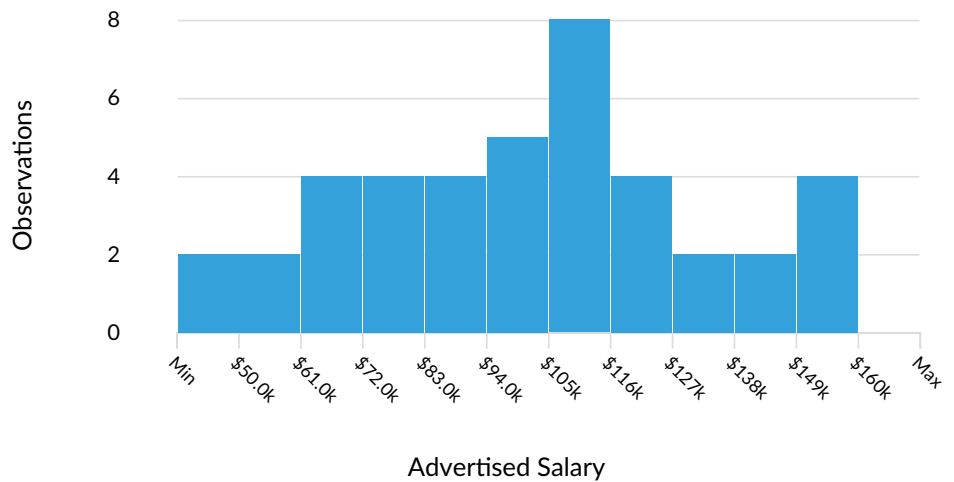
Advertised Salary

There are 41 advertised salary observations (3% of the 1,268 matching postings).

\$104.2K

Median Advertised Salary

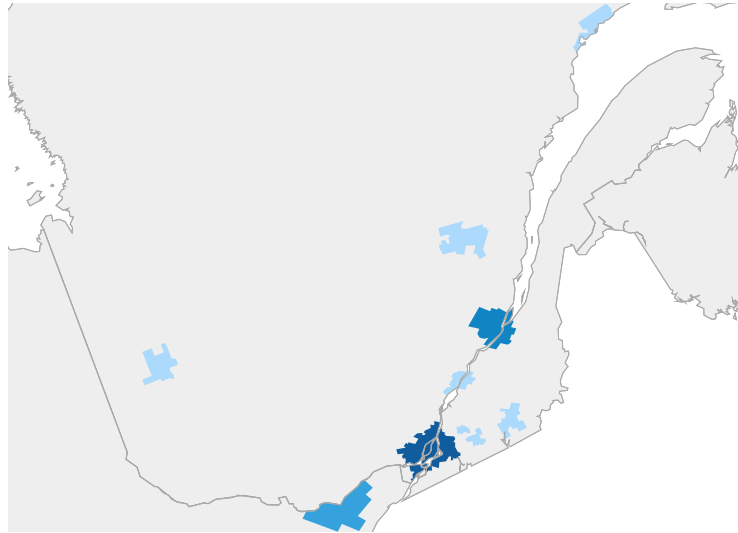
This is \$15.5K above the government recorded median salary for Cybersecurity specialists in Quebec.



Advertised Wage Trend

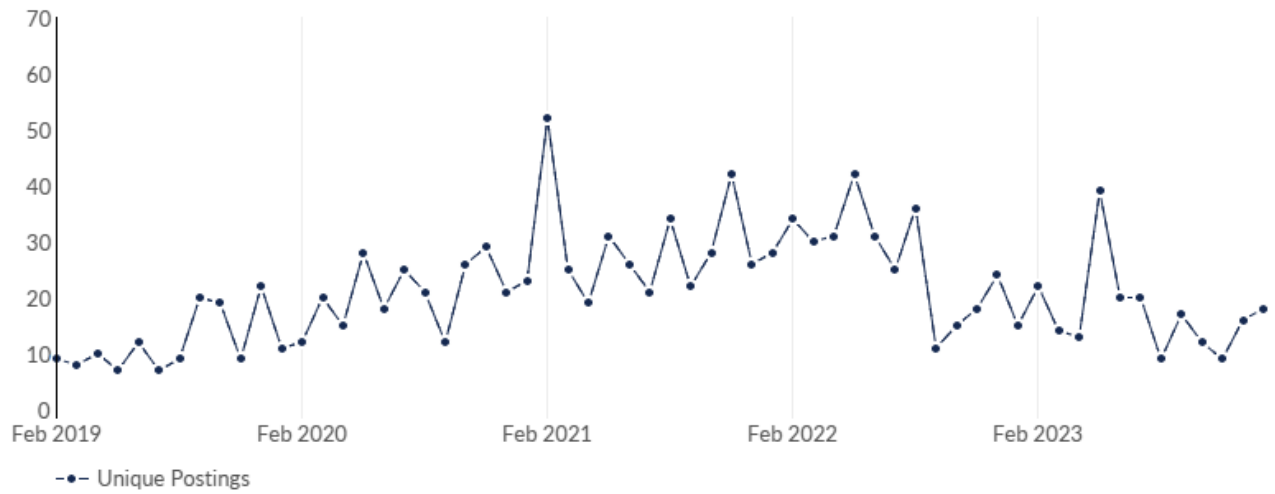
Not enough data for this chart.

Job Postings Regional Breakdown



CMA	Unique Postings (Feb 2019 - Jan 2024)
Montréal	1,123
Québec	93
Ottawa - Gatineau	17
Saguenay	6
Saint-Hyacinthe	3

Unique Postings Trend



Month	Unique Postings	Posting Intensity
Jan 2024	18	1 : 1
Dec 2023	16	2 : 1
Nov 2023	9	1 : 1
Oct 2023	12	1 : 1
Sep 2023	17	2 : 1
Aug 2023	9	2 : 1
Jul 2023	20	2 : 1
Jun 2023	20	2 : 1
May 2023	39	2 : 1
Apr 2023	13	2 : 1
Mar 2023	14	1 : 1
Feb 2023	22	2 : 1

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	0	0%
High school or GED	1	0%
Associate's degree	47	4%
Bachelor's degree	1,268	100%
Master's degree	189	15%
Ph.D. or professional degree	6	0%

Minimum Education Breakdown

Minimum Education Level	Unique Postings (minimum)	Unique Postings (max advertised)	% of Total (minimum)
High school or GED	1	0	0%
Associate's degree	46	0	4%
Bachelor's degree	1,221	45	96%
Master's degree	0	187	0%
Ph.D. or professional degree	0	6	0%





















Experience Breakdown

Minimum Experience	Unique Postings	% of Total
No Experience Listed	154	12%
0 - 1 Years	26	2%
2 - 3 Years	258	20%
4 - 6 Years	509	40%
7 - 9 Years	159	13%
10+ Years	162	13%



Top Companies Posting

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Bell	178 / 96	2 : 1	
Desjardins Group	128 / 67	2 : 1	
Bonidollars	107 / 58	2 : 1	
Banque Nationale	118 / 58	2 : 1	
Morgan Stanley	67 / 50	1 : 1	
Bombardier	92 / 46	2 : 1	
Air Canada	98 / 39	3 : 1	
CGI	49 / 38	1 : 1	
Intact	43 / 32	1 : 1	
Canadian National Railway	32 / 25	1 : 1	



Top Cities Posting

City	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Montreal, Montreal County	1,555 / 982	2 : 1 	
Quebec, Quebec County	114 / 77	1 : 1 	
Dorval, Montreal County	117 / 51	2 : 1 	
Gatineau, Gatineau County	45 / 17	3 : 1 	
Levis, Levis County	21 / 16	1 : 1 	
Longueuil, Longueuil County	20 / 15	1 : 1 	
Boucherville, Longueuil County	24 / 12	2 : 1 	
Laval, Laval County	23 / 11	2 : 1 	
Blainville, Therese-De Blainville County	13 / 10	1 : 1 	
Mirabel, Mirabel County	11 / 8	1 : 1 	





















Top Posted Occupations

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Cybersecurity specialists	2,072 / 1,268	2 : 1 	





















Top Posted Occupations

Occupation	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Cyber / Information Security Engineer / Analyst	2,072 / 1,268	2 : 1 	

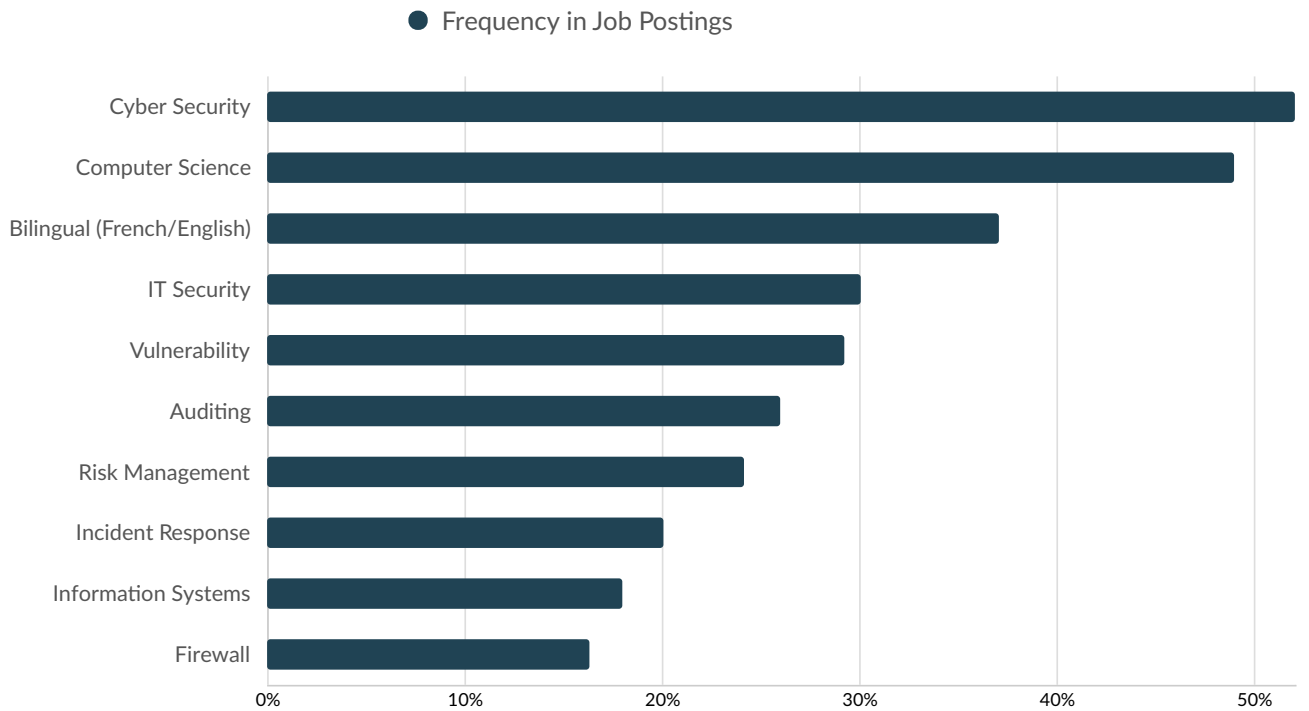
Top Posted Job Titles

	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Cybersecurity Specialists	130 / 72	2 : 1 	
Cybersecurity Analysts	95 / 63	2 : 1 	
IT Security Analysts	55 / 42	1 : 1 	
Information Security Analysts	49 / 38	1 : 1 	
Vulnerability Management Analysts	61 / 35	2 : 1 	
Security Advisors	102 / 33	3 : 1 	
Specialist Information Security Analysts	58 / 28	2 : 1 	
Identity and Access Management Managers	41 / 26	2 : 1 	
Cybersecurity Managers	42 / 25	2 : 1 	
Cybersecurity Consultants	31 / 22	1 : 1 	

Top Industries

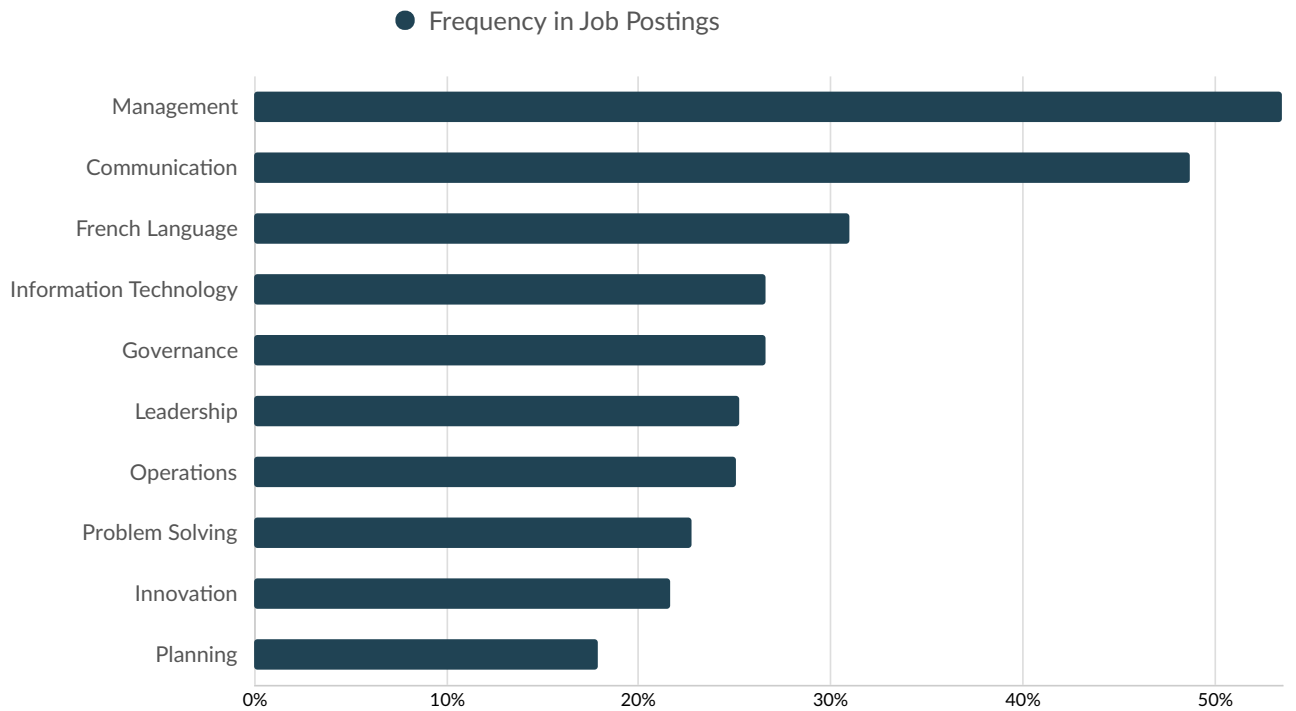
	Total/Unique (Feb 2019 - Jan 2024)	Posting Intensity	Unique Postings Trend (Feb 2019 - Jan 2024)
Wired Telecommunications Carriers	178 / 96	2 : 1 	
Commercial Banking	164 / 92	2 : 1 	
Credit Unions	129 / 68	2 : 1 	
Administrative Management and General Management Consulting Services	144 / 68	2 : 1 	
Direct Property and Casualty Insurance Carriers	79 / 56	1 : 1 	
Aircraft Manufacturing	98 / 51	2 : 1 	
Miscellaneous Financial Investment Activities	67 / 50	1 : 1 	
Software Publishers	61 / 44	1 : 1 	
Scheduled Passenger Air Transportation	98 / 39	3 : 1 	
Offices of Certified Public Accountants	52 / 39	1 : 1 	

Top Specialized Skills



	Postings	% of Total Postings
Cyber Security	660	52%
Computer Science	621	49%
Bilingual (French/English)	470	37%
IT Security	381	30%
Vulnerability	371	29%
Auditing	329	26%
Risk Management	306	24%
Incident Response	254	20%
Information Systems	228	18%
Firewall	207	16%

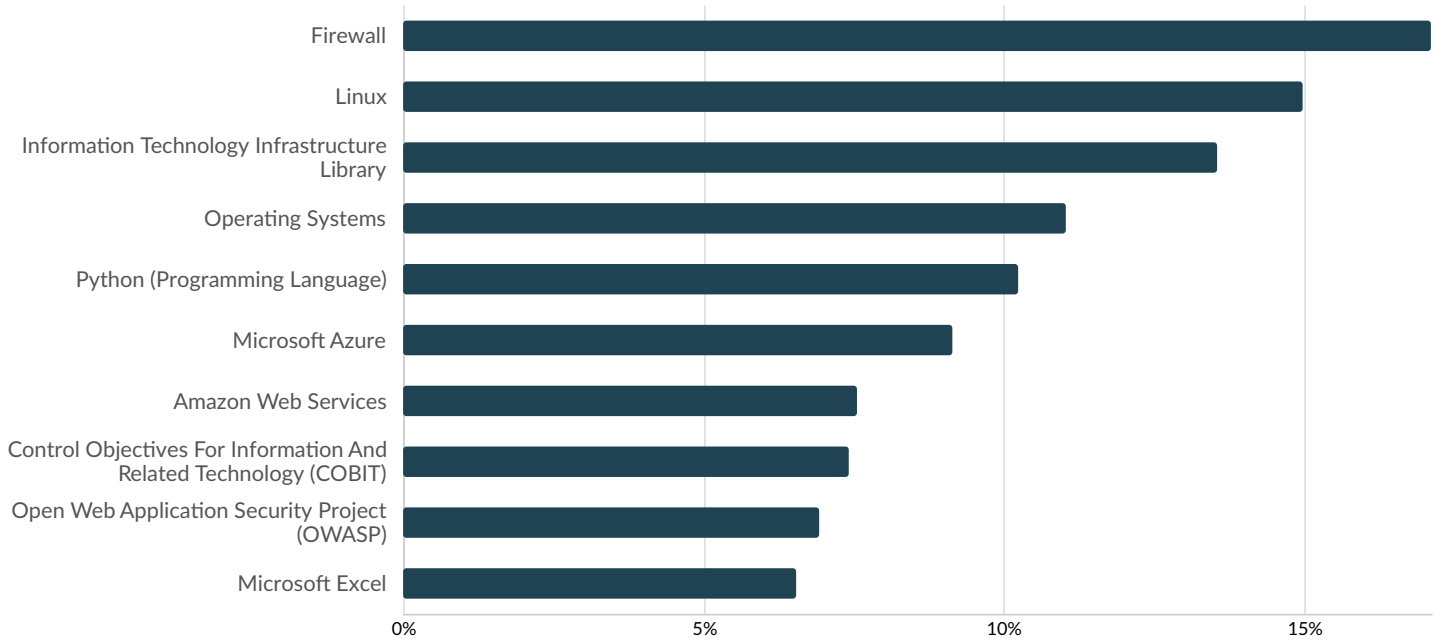
Top Common Skills



	Postings	% of Total Postings
Management	679	54%
Communication	618	49%
French Language	393	31%
Information Technology	338	27%
Governance	338	27%
Leadership	321	25%
Operations	318	25%
Problem Solving	289	23%
Innovation	275	22%
Planning	227	18%

Top Software Skills

● Frequency in Job Postings



	Postings	% of Total Postings
Firewall	217	17%
Linux	190	15%
Information Technology Infrastructure Library	172	14%
Operating Systems	140	11%
Python (Programming Language)	130	10%
Microsoft Azure	116	9%
Amazon Web Services	96	8%
Control Objectives For Information And Related Technology (COBIT)	94	7%
Open Web Application Security Project (OWASP)	88	7%
Microsoft Excel	83	7%

Top Qualifications

	Postings with Qualification
Certified Information Systems Security Professional	542
Certified Information Security Manager	304
Certified Information System Auditor (CISA)	275
GIAC Certifications	212
Certified In Risk And Information Systems Control	112
Offensive Security Certified Professional	96
Certified Ethical Hacker	94
NIST Cybersecurity Framework (CSF)	57
CompTIA Security+	53
Security Clearance	47

Appendix A

Top Posting Sources

Website	Postings on Website (Feb 2019 - Jan 2024)
indeed.com	192
careerjet.ca	170
myworkdayjobs.com	157
taleo.net	128
jobs.ca	120
workopolis.com	111
bce.ca	76
option-carriere.ca	49
jobillico.com	34
nbc.ca	31
aircanada.com	30
localwork.ca	30
jsfirm.com	28
theitjob.com	24
careerbuilder.ca	22
csod.com	22
careerbeacon.com	21
adp.com	19
njoyn.com	15
talentnet.community	15
energyjobline.com	14
deloitte.ca	13
cgi.com	11
jobbank.gc.ca	11
intactfc.com	10

Appendix B

Sample Postings

Incident Response Consultant, Mandiant, Google Cloud

Link to Live Job Posting: www.careerjet.ca

Location: Montreal, Montreal County

Company: Google

Job Title: Incident Response Consultants

Incident Response Consultant, Mandiant, Google CloudGoogleMontreal, QC \$103,000-151,000 per year Permanent Full-time1 day ago

Note:

Google's hybrid workplace includes remote and in-office roles. By applying to this position you will have an opportunity to share your preferred working location from the following: In-office locations: Toronto, ON, Canada; Montreal, QC, Canada; Kitchener, ON, Canada. Remote location(s): Ontario, CA; Canada. Minimum qualifications: Bachelor's degree in Computer Science, a related technical field, or equivalent practical experience. 3 years of Investigative experience with network forensics and log analysis, malware triage analysis, disk, and memory forensics in one or more of the following: Linux or Unix. Ability to travel up to 20% of the time as required. Preferred qualifications: Certifications in Cloud Platforms (e.g., Google Cloud Platform (GCP)). Experience in cloud forensic. Ability to communicate investigative findings and strategies to technical staff, executive leadership, legal counsel, and internal and external clients. Excellent time management skills. Excellent written and verbal communication skills, with the ability to develop documentation and explain technical details in a concise manner. About the job As a Security Consultant, you will be responsible for helping clients effectively prepare for, proactively mitigate, and detect and respond to cyber security threats. Security Consultants have an understanding of computer science, operating system functionality and networking, cloud services, corporate network environments and how to apply this knowledge to cyber security threats. In this role, you will assist clients in navigating technically complex and high-profile incidents, performing forensic analysis, threat hunting, and malware triage. You'll also test client networks, applications and devices by emulating the latest techniques to help them defend against threats, and will be the technical advocate for information security requirements and provide an in-depth understanding of the information security domain. You will also articulate and present complex concepts to business stakeholders, executive leadership, and technical contributors and successfully lead complex engagements alongside cross functional teams. Mandiant Services provides incident response, assessment, transformation, managed detection and response, and training services with direct tactical support. Our incident responders are able to resolve security incidents quickly, effectively, and at scale with complete incident response including investigation, containment, remediation, and crisis management. Mandiant is a recognized leader in dynamic cyber defense, threat intelligence and incident response services. By scaling decades of frontline experience, Mandiant helps organizations to be confident in their readiness to defend against and respond to cyber threats. Mandiant is now part of Google Cloud. The US base salary range for this full-time position is \$103,000-\$151,000 + bonus + equity + benefits. Our salary ranges are determined by role, level, and location. The range displayed on each job posting reflects the minimum and maximum target for new hire salaries for the position across all US locations. Within the range, individual pay is determined by work location and additional factors, including job-related skills, experience, and relevant education or training. Your recruiter can share more about the specific salary range for your preferred location during the hiring process. Please note that the compensation details listed in US role postings reflect the base salary only, and do not include bonus, equity, or benefits. Learn more about . The British Columbia base salary range for this full-time position is

CAD 116,000-131,000

+ bonus + equity + benefits. Our salary ranges are determined by role, level, and location. The range displayed on each job posting reflects the minimum and maximum target for new hire salaries for the position. Within the range, individual pay is determined by work location and additional factors, including job-related skills, experience, and relevant education or training. •

Note:

Disclosure as required by Bill 13 Please note that the compensation details listed in Canada role postings reflect the base salary only, and do not include bonus, equity, or benefits. Learn more about .ResponsibilitiesCollaborate with internal and customer teams to investigate and contain incidents.Lead small-scale investigation, contribute to complex client-facing investigations and examine cloud, endpoint, and network-based sources of evidence.Recognize and codify attacker Tools, Tactics, and Procedures (TTPs) and Indicators of Compromise (IOCs). Build scripts, tools, or methodologies to enhance Mandiant's incident investigation processes that can be applied to current and future investigations.Develop comprehensive and accurate reports and presentations for technical and non-technical audiences.Maintain knowledge of tools and best practices to respond to the techniques, tools, and procedures of advanced persistent threat, financial, and hacktivist threat actors.Google is proud to be an equal opportunity workplace and is an affirmative action employer. We are committed to equal employment opportunity regardless of race, color, ancestry, religion, sex, national origin, sexual orientation, age, citizenship, marital status, disability, gender identity or Veteran status. We also consider qualified applicants regardless of criminal histories, consistent with legal requirements. See also and If you have a disability or special need that requires accommodation, please let us know by completing our .Google

Security architect	
Link to Live Job Posting: www.thorens-solutions.com	
Location: Montreal, Montreal County	Company: Thorens Solutions
Job Title: Security Architects	

Security architect Security architect Company name: Thorens Solutions - Headhunters Activity area : Consulting Engineering /

Engineering Salary :

Salary from \$100,000 to \$150,000 Job type : Permanent - Full time

City :

Montreal Company description Present worldwide, our customer is a leader in the Cybersecurity industry covering more than 50 countries. The company's main strength is that it creates and provides customized managed security services (24-hour surveillance 24/7) and professional services to meet the security and privacy challenges security and confidentiality challenges. Job description The role of the Security Architect is to work with the Managed Security Services team to secure client's information. He is mainly responsible for determining security requirements, planning onboarding activities and implementing MSS solutions. Tasks and Responsibilities Be part of the onboarding of new Systems Security Inc clients by defining security strategy, writing up processes to implement correlation rules and onboarding tasks, following up deployment and insuring quality of communication during onboarding process; Enhance security team accomplishments and competence by planning delivery of solutions; answering technical and procedural questions for less experienced team members; teaching improved processes; mentoring team members. Be an escalation point for Information Security Analysts, Information Security Specialists and Incident Response Managers to assist in solving security issues, correlation rules creation/update and other issues related to log ingestion and SOC monitoring. Design and update correlation rules based on client security control situation and cyber threat circumstance and create and maintain correlation guideline and review process. Determine security requirements by evaluating business strategies and requirements; researching information security frameworks; conducting system security and vulnerability analyses and risk assessments; studying architecture/platform; identifying integration issues; preparing effort estimates. Define security strategies for Systems Security Inc clients by specifying intrusion detection methodologies and equipment; directing equipment and software installation and calibration; preparing preventive and reactive measures; completing documentation. Maintain security monitoring strategy of Systems Security Inc customers by conducting regular customer reviews aimed at aligning our security services/monitoring with customer's constant evolving security challenges. Prepare system security report templates by collecting, analyzing, and summarizing data and trends. Leads technology architecture practices related to Cloud infrastructures. Be part of both customer and internal support in order to identify and solve complex problems related to MSS service support globally. Update job knowledge by tracking and understanding emerging security practices and standards; participating in educational opportunities; reading professional publications; maintaining personal networks; participating in professional organizations. Be part of a senior team leading MSS technical changes aiming at enhancing our services. Qualifications University degree in Computer Science; A minimum of 5 years of relevant experience in IT Security; Excellent understanding of IT Security controls; Excellent knowledge of Linux operating systems (RHEL, CentOS); Good experience with TCP/IP protocol and low-level network troubleshooting (VPN/IPSEC, etc.); Experience in Cloud computing technology including core services, compute and storage, database, Application Programming Interface (API), Microsoft 365, Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), etc.; Experience with on-premise to Cloud migrations or IT transformations; Experience architecting and operating solutions built on Amazon or Azure platforms; Experience with different elements ensuring network security (firewalls, proxies, etc.); Understanding of security frameworks like PCI-DSS or

ISO 27001/27002.

Work conditions Position full-time, permanent; Salary 100,000 to \$150,000; Insurance.

Note :

The masculine is used to lighten the text without prejudice to the feminine form. APPLY Your recruiter Dorothe Giroux Headhunter Being an empathetic person and a good listener, I've always enjoyed supporting people on their professional journey. And as a headhunter, I have the chance to help professionals grow in their careers. Everyone is different, and your career path is important to me. So I'd be delighted to listen carefully to your life experience. 514-842-7846 x 222 dorotheeg@thorens-solutions.com Apply NEXT Montreal 514-842-7846 Toronto 613-699-0021 CONTACT USThorensCandidateEmployerSite mapTerms of usePrivacy policyPowered by

Manager of IT and Information Security

Link to Live Job Posting: fellowapp.bamboohr.com

Location: Montreal, Montreal County

Company: Fellowapp

Job Title: Directors of Information Security

Manager of IT and Information Security/IT & Security Montreal, Quebec (Remote) Hey there I'm Amin, Co-Founder of Fellow. We are seeking an experienced IT and Infosec professional to lead these dual areas for Fellow as we continue our growth in the coming years. About the role You will be the security subject-matter expert and lead all IT administration & Information Security-related matters across the organization. This is a cross-functional role and the candidate will be expected to ensure each team upholds our security bar. Being a relatively small company (~70), you must be able to work independently in these areas to help us scale into the future. Although a combo role of this nature is unorthodox, this is a perfect opportunity for an ambitious individual with tangible experience in both IT administration as well as Security & Compliance to secure a future in a venture backed startup destined for greatness. We're hiring remotely across Canada, but have offices and co-working spaces available in Ottawa, Montreal, and Toronto where you can pop in to work with other Fellow employees when you want some in-person time!

Key IT Responsibilities:

Select, Configure, and Deploy an MDM for our fleet of Macbooks Provide IT support to all employees, including onboarding, offboarding, and any troubleshooting needs that may arise. Manage procurement, licensing, provisioning, and administration of all major software systems needed to run the business Manage all IT asset procurement, maintenance, and disposal as needed Focus on improving IT processes to ensure business continuity and align with our security posture. Monitor employee systems to ensure compliance with security policies

Key Infosec Responsibilities:

Build out and maintain our security compliance programs (e.g. SOC2, ISO27001, HIPAA, etc) Advise on and ensure compliance with data privacy regulations (e.g. GDPR, CCPA, etc) Work with senior leadership to periodically review and update all security policies and BC/DR plans Conduct vendor risk assessments, remediation, and maintain corporate Risk Register Interface with auditors on obtaining ongoing security compliance certifications Manage training for general infosec awareness and security centric development practices Assist the rest of the team with cybersecurity threats and response Work directly with our customers and prospects on security questionnaires, and maintain pre-completed versions of common ones (e.g. CSA CAIQ, CCM, SIG/SIG-Lite)

Minimum Qualifications:

5+ years in IT management (at least 2 in a Mac shop) 2+ years cybersecurity / infosec experience Bachelor's Degree or certification in information systems or equivalent

Resident of Canada Ideal Candidate Profile:

Past experience leading this function at a tech startup Resilient, with strong prioritization skills, able to excel in both quiet and high-pressure periods with focused efficiency and adaptability A hands on leader who is able to lead by example and who can build a team over time Deep expertise across security, privacy, IT audit, and legal security standards, guidelines, and principles Experience enforcing secure coding practices, threat modeling, identity, access management, and security incident response and recovery. CISSP, CISA, CISM or other infosec certifications preferred Direct experience in the following areas Administering Google Workspace, Slack GRC products such as Vanta, Drata, etc MDMs in a Mac environment Drafting infosec policies Security questionnaires Interfacing with external auditors on compliance programs What is Fellow? Fellow.app is a software company that helps teams and organizations level-up their meeting habits to drive productivity, engagement, and accountability before, during, and after every meeting. With Fellow, great meetings are just the start. Our product is the #1 meeting management software on G2, and is trusted by the world's best teams. Established in 2017, our team works remotely from cities across Canada, guided by our mission: Make Work Better for Everyone and that includes our own employees! We're an ambitious team building the next big thing and we'd love to have you on this journey with us. Equal Opportunity Employer At Fellow, we understand the value of having a diverse team. That's why we believe in providing equal opportunity employment regardless of race, national or ethnic origin, colour, religion, age, sex, sexual orientation, gender identity or expression, marital status, family status, genetic characteristics, disability, and conviction. Please let us know if you require accommodation during the recruitment process.

Cybersecurity Specialist	
Link to Live Job Posting: www.careerjet.ca	
Location: Montreal, Montreal County	Company: Expertech
Job Title: Cybersecurity Specialists	
<p>Cybersecurity SpecialistExpertechMontreal, QC Permanent Full-time1 day ago•Permanent position in hybrid mode.Our client, a high-profile company with headquarters in Montreal, is currently looking for a Cybersecurity Specialist to join their team in Montreal. This is a permanent position with attractive compensation and benefits.</p> <p>Responsibilities:</p> <p>Create a roadmap for the definition and implementation of a Cloud security framework.Advise on meeting compliance with information security policies and procedures.Provide expertise in the definition, selection, and implementation of IT Security related controls to the IT Department.Review and offer security recommendations for architecture diagrams.Periodically review and assess cloud instances and integrations (AWS and Azure).Track risks using the GRC tool.Identify Cyber risks, communicate and develop best practice solutions, and implement mitigating controls consistent with company strategy.</p> <p>Qualifications:</p> <p>University degree/technical certification, and/or relevant experience to the role.Over 5 years of IT technology experience with a minimum of 3 years in an IT Security role, in a large company.Extensive Cloud (AWS & Azure), Infrastructure and Architecture understanding.Certification in Information Security (CISSP, ISC, CISM, CCSP) practices and policies an asset.Bilingualism preferred.Refer a friend and get up to \$1500!</p> <p>About Expertech:</p> <p>Connecting talent with employers of choice for over 25 years, Expertech is a leading staffing and recruiting firm. Our goal is to understand both our clients' and our candidates' needs in order to find the perfect match. Our clients include a wide selection of national and international companies in a broad range of industries.ExperTech would like to thank all applicants for their interest in this opportunity, but only shortlisted candidates will be contacted. Please visit our website to see our other available positions: https://expertech.ca/ and follow us on</p> <p>LinkedIn:</p> <p>https://ca.linkedin.com/company/expertech-recruiting .At Expertech, all candidates are welcome regardless of race, nationality, color, religion, gender, gender identity or expression, sexual orientation, disability or age.ExperTech</p>	

Project Cybersecurity Manager	
Link to Live Job Posting: Posting is no longer active	
Location: Montreal, Montreal County	Company: Alstom
Job Title: Cybersecurity Project Managers	
<p>Project Cybersecurity Manager Date: 14 Jan 2024</p> <p>Location: Montreal, QC, CA Company:</p> <p>Alstom Req ID: 418299 Leading societies to a low carbon future, Alstom develops and markets mobility solutions that provide the sustainable foundations for the future of transportation. Our product portfolio ranges from high-speed trains, metros, monorail, and trams to integrated systems, customised services, infrastructure, signalling and digital mobility solutions. Joining us means joining a caring, responsible, and innovative company where more than 70,000 people lead the way to greener and smarter mobility, worldwide Join Alstom in this career-defining role as a Cybersecurity Project Manager based in Montreal, Canada. Your objective in this role is to analyse Tender / Project security needs (including laws and local regulations) and determine security objectives and main security risk strategies. You will do this by working with a global team of engineers and project managers; in a diverse and inclusive environment.</p> <p>Your activities would be: Plan security activities within the development life cycle, estimate costs and duration, their impacts related to tender/project execution and identify training needs.Cybersecurity context and Cybersecurity Risk AnalysisCybersecurity Architecture definition and requirement allocationCascading requirements to suppliers, Managing Third Parties RisksApplication of Cybersecurity Assurance LevelDefinition of Cybersecurity Operating ProceduresEvaluation of the Tender/Project achieved Cybersecurity levelManage the budget of the project regarding CybersecurityManage the subcontractors in his/her perimeterProvide support during technical design meetings for cybersecurity activitiesReport on Tender / Project Cybersecurity statusIn case of external Cybersecurity audit, manage the relationship with auditors and establish lessons learned Education Bachelor's Degree in EngineeringCybersecurity certifications preferred Experience 5+ years of experience related to Cybersecurity in general and deployment experience of security technologies.Experience working with industrial companiesExperience with Poject ManagementExperience working with engineering teamsExperience reporting and comunicating critical information to stakeholders Competencies & Skills Engineering BackgroundKnowledge of main Cybersecurity standards and regulations, such as ISO 2700X, 62443, NIST, NIS, IEC 62443 Knowledge of some Cybersecurity solutions and areasArchitecture concepts and techniques of systems and networks, operating systems, and associated programming languages.Knowledge of the main techniques for evaluating systems security Alstom is the leading company in the mobility sector, solving the most interesting challenges for tomorrow's mobility. That's why we value inquisitive and innovative people who are passionate about working together to reinvent mobility, making it smarter and more sustainable. Day after day, we are building an agile, inclusive and responsible culture, where a diverse group of people are offered opportunities to learn, grow and advance in their careers, with</p>	

options across functions and geographic locations. Are you ready to join a truly international community of great people on a challenging journey with a tangible impact and purpose?

Equal opportunity statement:

Alstom is an equal opportunity employer committed to creating an inclusive working environment where all our employees are encouraged to reach their full potential, and individual differences are valued and respected. All qualified applicants are considered for employment without regard to race, colour, religion, gender, sexual orientation, gender identity, age, national origin, disability status, or any other characteristic protected by local law.

Job Type:

Experienced

Appendix C - Data Sources and Calculations

Lightcast Job Postings

Job postings are collected from various sources and processed/enriched to provide information such as standardized company name, occupation, skills, and geography.

Library Report
For the Proposed

Bachelor of Engineering in Cybersecurity Engineering & Bachelor of Science in Cybersecurity

Chloe Lei, Teaching & Research Librarian, Engineering and Computer Science

Created: 4 April, 2024

Purpose

The purpose of this report is to assess the adequacy of available library resources to support the proposed undergraduate programs in cybersecurity at Concordia University. The report identifies resources and funding required to support the program.

Summary

The Library can adequately support this new program within its current collections budget.

Concordia programs and comparators

Currently the Faculty offers two specialized Master's programs in cybersecurity and a PhD program in Information and Systems Engineering, all under the Concordia Institute for Information Systems Engineering (CIISE). The Steering Committee identified comparator programs at Polytechnique Montréal, Université du Québec en Outaouais, and Seneca College. These institutions' collection will be used as comparators throughout this report.

Collections Assessment

Monographs

Current Collection Growth

CIISE is supported under the budget envelope for Computer Science and Software Engineering (CSSE). For the current fiscal year, 2023/2024, the budget allocation for CSSE is \$11,300. For the previous three complete fiscal years, our budget allocations and monograph acquisitions have been as follows:

Year	Allocation	Monographs acquired
2022/2023	12,400	49
2021/2022	13,500	45
2020/2021	13,500	52

Note that there has been a slight decrease in the monograph budget for CSSE since 2022/2023 due to a revised library budget allocation formula taking into account multiple variables such as programs, enrolment data and ebook package expenditure by subject area.

In addition to monographs acquired using the subject allocations specified above, the library also subscribes to or purchases a number of ebook packages with relevant content for cybersecurity. These include:

- IEEE-Wiley ebooks
- Institution of Engineering and Technology (IET) ebooks
- Knovel ebooks
- O’Reilly ebooks (formerly Safari Books Online)
- ScienceDirect ebooks
- Springer ebooks
- Synthesis Digital Library of Engineering and Computer Science ebooks
- Taylor & Francis ebooks (GENERAENGINEERINGnetBASE collection)

A collection analysis was performed in 10 subject areas that fall within cybersecurity to determine the average percent growth in area in the past three years at Concordia and the comparator institutions.

	Concordia	Polytechnique Montréal	Université du Québec en Outaouais	Seneca College
<i>Annual percent growth (3 year average)</i>	29.89	28.78	24.60	29.71

Recommendation

Concordia’s annual collection growth is in line with the comparator institutions. The Library can adequately support this new program with its current monograph budget allocation.

Journals

Current collection

The Library has a substantial collection of electronic journals, which are usually acquired in bundles, either from a publisher or an aggregator. These subscription bundles, generally managed on a national or provincial level by the Canadian Research Knowledge Network (CRKN) consortium of academic libraries or the Partenariat des bibliothèques universitaires du Québec (PBUQ), include journals relevant to cybersecurity. They include:

- ACM (Association for Computing Machinery)
- APS (American Physical Society)
- Elsevier
- IEEE (Institute of Electrical and Electronics Engineers)
- Sage

- Springer
- Taylor & Francis
- Wiley-Blackwell.

Needs assessment

A core list of 65 journals in cybersecurity was compiled and compared to Concordia's current holdings. Those titles where Concordia had no access or where there was an embargo on current access were prioritized as either high, medium or low priorities. There was 1 title to which Concordia has no access and it is not deemed to be high priority.

Recommendation

The Library's current journal subscriptions and packages are adequate for the needs of the proposed program.

Databases

Current collection

The Library has many subscriptions to electronic databases and indexes. Those most relevant to cybersecurity include:

Database name	Database content
<i>ACM Digital Library</i>	Contents published by ACM, covering computer science, information technology, software engineering, networking, wireless communications, and other computing-related subjects.
Compendex	A bibliographic database covering engineering research literature since 1884.
IEEE Xplore	Contents published by IEEE, covering many fields including circuits, communication systems, computer engineering, information theory, robotics, power engineering, signal processing, telecommunications.
Inspec	A bibliographic database covering physics, electrical engineering, electronics and computing.
Inspec Analytics	A research intelligence tool to help research professionals explore global trends in physics, engineering and technology research, released by the IET (Institute of Engineering and Technology).
<i>JoVE</i>	The Journal of Visualized Experiments (JoVE) is a peer-reviewed journal and database of experiments in video format.
Knovel	A platform for engineering technical references, including interactive features for material property data and math equations.
Scopus	This multidisciplinary database has over 19,000 titles from more than 5,000 international publishers, including journals and conference proceedings in science and technology.
SPIE Digital Library	A collection of contents in optics and photonics research by the Society of Photo-Optical Instrumentation Engineers.
Web of Science	This multidisciplinary database covers the journal literature of the sciences through the Science Citation Index Expanded, which includes the fields of science and engineering.

Needs assessment

A review of computer science and software engineering databases available at Polytechnique Montréal, Université du Québec en Outaouais, and Seneca College was completed. There were 2 databases available at other institutions that are not available at Concordia. One of them is held by 2 of the comparators, and the other one is held by only 1 of the comparators.

Recommendation

The Library's current database subscriptions are adequate for the needs of the proposed program.

Collections Recommendation Summary

The Library can adequately support this new program within its current collections budget.

Additional Library services

All university libraries in Quebec use the same shared services platform called Sofia, which allows students and faculty from all Quebec university libraries to search, access, request and borrow items from the collections of the 18 partner institutions.

The interlibrary loan service, also integrated in Sofia, provides students and faculty with the ability to request materials that are not available in the Concordia Library collection, including electronic delivery of journal articles.

Academic Support

The Teaching & Research Librarian for Engineering and Computer Science is available to conduct course-specific library workshops, as requested by faculty, and provides help with library research on an individual basis for all students and faculty in the Departments. A team of professional librarians and trained staff help Concordia students and faculty with their basic information and research questions at the Ask Us Desks, as well as via email and chat.

Conclusion

A careful assessment was made of the library's current monograph holdings and journal subscriptions to determine the adequacy of available library resources to support the two proposed undergraduate programs in cybersecurity at Concordia University. It was determined that the Library can adequately support the new programs within its current collections budget.



This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Dr. Manar AMAYRI

Correspondence language: English

Contact Information

The primary information is denoted by (*)

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This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Protected when completed

Dr. Manar AMAYRI

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	No

Degrees

- 2017/10 Doctorate, Smart buildings, Institut national polytechnique de Grenoble
Supervisors: Professor Stephane Ploix, 2014/9 - 2017/10
- 2014/7 Master's Thesis, Smart Grids and Buildings, Institut national polytechnique de Grenoble
- 2010/8 Master's Thesis, Energy, Damascus University
- 2006/8 Bachelor's, Electrical Power Engineering, Damascus University

Recognitions

- 2022/7 Best paper award, IEA/AIE 2022
International conference on Industrial Engineering & Other Applications of Applied Intelligent Syste
Prize / Award
Best paper award with my student Jiaxun Guo, Prof. Nizar bouguil and Prof. Wentao Fan, 35th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2022), "A Generalized Inverted Dirichlet Predictive Model for Activity Recognition using Small Data"
- 2022/5 Best poster award IBPSA France 2022
International Building Performance Simulation Association.
Prize / Award
Best poster award IBPSA France 2022 with my student Estefania Alvarez, Prof. Stephane Ploix, and Prof. Patrick Reignier, IBPSA France 2022, International Building Performance Simulation Association, "Apprentissage interactif et cooperatif pour l' experimentation de son chez-soi"

User Profile

Research Specialization Keywords: Machine learning, Explainable AI, Smart buildings, Energy management systems, Interactive learning, Human-in-the-loop AI, Self-consumption, Data mining

Employment

2023/1	Assistant Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Assistant Professor Tenure Status: Tenure Track
2020/12 - 2022/12	Affiliate Assistant professor, Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science CIISE, Concordia University Full-time Tenure Status: Non Tenure Track
2020/9 - 2022/12	Maitresse de Conferences ENSE3, Institut national polytechnique de Grenoble Full-time, Assistant Professor Tenure Status: Tenure
2020/4 - 2020/8	Postdoctoral Research Fellow CIISE, Concordia University Full-time Tenure Status: Non Tenure Track
2019/1 - 2020/2	Postdoctoral Research Fellow GSCOP, Institut national polytechnique de Grenoble Full-time Tenure Status: Non Tenure Track
2017/11 - 2018/12	Postdoctoral Research Fellow Centre national de la recherche scientifique (CNRS), Institut national polytechnique de Grenoble Full-time Tenure Status: Non Tenure Track

Leaves of Absence and Impact on Research

2022/9 - 2022/9	Medical, Institut national polytechnique de Grenoble I took leave of absence of two weeks because of medical reasons. Although it has not affected my overall research performance, I unfortunately missed few deadlines related to papers and proposals submissions.
2022/6 - 2022/6	Medical, Institut national polytechnique de Grenoble I took leave of absence of one week because of medical reasons. It has not affected my overall research performance.

Research Funding History

Awarded [n=5]

2023/9 - 2026/8 Co-investigator	AI-Based Approaches to Improve Business Intelligence Solutions, Grant Funding Sources: PROMPT-Québec Total Funding - 701,000 Portion of Funding Received - 350,000 Funding Competitive?: Yes
2023/1 - 2024/12	Concordia Start-Up research grant, Grant

Principal Investigator	<p>Funding Sources: Concordia University Concordia Start-UP research Total Funding - 50,000 Portion of Funding Received - 50,000 Funding Competitive?: No</p>
2023/6 - 2024/5 Principal Applicant	<p>Occupancy Estimation using Passive WiFi Sensing, Grant</p> <p>Funding Sources: Concordia University AI2 Spring Call for Proposals (Collaborations with Industry: Aerial.ai) Total Funding - 77,870 Portion of Funding Received - 77,870 Funding Competitive?: Yes</p>
2023/4 - 2024/3 Principal Investigator	<p>Decarbonization Solutions using AI, Grant</p> <p>Funding Sources: Concordia University Concordia Sustainable Transitions Team Research Initiative Total Funding - 20,000 Portion of Funding Received - 20,000 Funding Competitive?: Yes</p>
2023/1 - 2023/12 Principal Investigator	<p>Human in the Loop Machine Learning for Smart Buildings, Grant</p> <p>Funding Sources: Concordia University Applied AI Institute's Funding Program Total Funding - 8,000 Portion of Funding Received - 8,000 Funding Competitive?: Yes</p>
Completed [n=3]	
2021/9 - 2023/4 Co-investigator	<p>LearningHome: Cooperative and active learning for the responsible improvement of energy practices in the residential sector, Grant</p> <p>Funding Sources: Agence nationale de la recherche (ANR) (France) Total Funding - 576,000 Portion of Funding Received - 60,000 Funding Competitive?: Yes</p>
2022/1 - 2022/12 Principal Applicant	<p>Machine learning for self-consumption monitoring, Grant</p> <p>Funding Sources: Institut National Polytechnique de Grenoble Total Funding - 15,000 Portion of Funding Received - 15,000 Funding Competitive?: No</p>
2020/4 - 2022/3 Collaborator	<p>Machine Learning and Data Mining for Smart Buildings, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 186,666 Portion of Funding Received - 40,000 Funding Competitive?: Yes</p>

Student/Postdoctoral Supervision

Bachelor's [n=9]

2023/5 - 2023/8 Principal Supervisor	Hamdi Barkous, Ecole Polytechnique, Tunisia Thesis/Project Title: Time series forecasting, Mitacs Globalink (research internship from May 2023 to August 2023) Present Position: Undergrad Student
2022/4 - 2022/7 Principal Supervisor	Joseph Hespel (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Design of a method for evaluating the impact of occupant usage in a home context Present Position: Master's Student, Institut National Polytechnique de Grenoble
2022/2 - 2022/5 Principal Supervisor	Matthieu Corman (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Design of a management system for the charging of electric vehicles in GreEN-ER Present Position: Master's Student, Institut National Polytechnique de Grenobl
2022/2 - 2022/5 Principal Supervisor	Valentin Basto-Poultier (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Non-Intrusive Load Monitoring Using machine learning techniques Present Position: Master's Student, Institut National Polytechnique de Grenoble
2021/9 - 2022/2 Principal Supervisor	Fournier Camille (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: EV Charging Stations Load Forecasting Using Learning Techniques Present Position: Master's Student, Institut National Polytechnique de Grenoble
2021/9 - 2022/2 Principal Supervisor	Alexandre Boueil (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: On Short-Term Load Forecasting Using Learning Techniques Present Position: Master's Student, Institut National Polytechnique de Grenoble
2021/9 - 2022/2 Principal Supervisor	Thomas Guillot Goguet (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: On Short Term Load Forecasting for Model Predictive Controller Application Present Position: Master's Student, Institut National Polytechnique de Grenoble
2021/9 - 2022/2 Principal Supervisor	Dina Calise (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Use of transfer learning for occupancy estimation Present Position: Master's Student, Institut National Polytechnique de Grenoble
2021/3 - 2021/7 Principal Supervisor	Jawher Dridi (Completed) , Ecole Polytechnique, Tunisia Thesis/Project Title: Transfer learning for activity recognition in smart buildings, Mitacs Globalink (research internship from March 2021 to July 2021) Present Position: Undergrad Student

Master's Equivalent [n=3]

2022/1 - 2022/8 Principal Supervisor	Mohammad Ali Kazan (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: On Short-Term Load Forecasting Using Learning Techniques Present Position: PhD student, Institut National Polytechnique de Grenoble
2020/2 - 2020/8 Principal Supervisor	Almudena Maroto (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Automatic generation of home reports for Smart Homes and analysis of their impact on behaviour changes Present Position: PhD student, Institut National Polytechnique de Grenoble

2020/1 - 2021/9
Co-Supervisor Joana Nunes Nicolau Baptista da Silva (Completed) , Lisbon Higher Technical Institute
Thesis/Project Title: Cooperative and Interactive Learning to estimate human behaviour for energy applications.
Present Position: PhD student, Lisbon Higher Technical Institute

Master's Thesis [n=14]

2023/9 - 2025/12
Principal Supervisor Naailah Mahamoodally, Concordia University
Thesis/Project Title: Explainable transfer learning
Present Position: Master student

2023/9 - 2025/12
Principal Supervisor Belal Mahmud, Concordia University
Thesis/Project Title: Machine Learning for *Electric Vehicle*, *Data Augmentation and Demand Forecasting*,
Present Position: Master student

2023/5 - 2025/4
Principal Supervisor Nicholas Simo (In Progress) , Concordia University
Student Degree Expected Date: 2025/4
Thesis/Project Title: Anomaly detection in HVAC systems
Present Position: Master Student, Concordia University

2023/5 - 2025/4
Principal Supervisor Maher Dissem (In Progress) , Concordia University
Student Degree Expected Date: 2025/4
Thesis/Project Title: Reinforcement learning for smart building applications
Present Position: Master Student, Concordia University

2022/9 - 2024/8
Principal Supervisor Skander Chouchène (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: Transfer learning for energy disaggregation
Present Position: Master Student

2022/1 - 2023/12
Principal Supervisor Oussama Sghaier (Completed) , Concordia University
Thesis/Project Title: Optimizations strategies using MILP approach for energy applications
Present Position: Master Student

2022/1 - 2023/8
Principal Supervisor Jawher Dridi (Completed) , Concordia University
Thesis/Project Title: Unsupervised Domain Adaptation for Estimating: Occupancy and Recognizing Activities in Smart Buildings Un Unsupervised Domain Adaptation for Estimating: Occupancy and Recognizing
Present Position: Research associate, Concordia University

2021/9 - 2023/6
Co-Supervisor Ahmed Rebei (Completed) , Concordia University
Thesis/Project Title: Load Forecasting using Meta-Learning
Present Position: Research associate, Université de Montreal

2021/1 - 2023/5
Co-Supervisor Mohammad Akbar (Completed) , Concordia University
Thesis/Project Title: Data Driven Disaggregation Methods for Electricity Based Energy Consumption for Smart Homes
Present Position: PhD student, Concordia University

2020/2 - 2021/10
Co-Supervisor Soudabeh Tabarsaii (Completed) , Concordia University
Thesis/Project Title: Non-Intrusive Load Monitoring Using Additive Time Series Modeling via Finite Mixture Models Aggregation
Present Position: AISTORM Inc Toronto Canada

2020/1 - 2022/6
Co-Supervisor Oumayma Dalhoumi (Completed) , Concordia University
Thesis/Project Title: Bayesian Matrix Factorization and Applications
Present Position: Data Scientist Ericsson

2019/9 - 2021/12 Co-Supervisor	Jiaxun Guo (Completed) , Concordia University Thesis/Project Title: Occupancy Estimation and Activity Recognition in Smart Buildings using Mixture-Based Predictive Distributions Present Position: PhD student, Concordia University
2019/9 - 2021/8 Co-Supervisor	Zixiang Xian (Completed) , Concordia University Thesis/Project Title: Generative Models Based on the Bounded Asymmetric Gaussian Distribution Present Position: Instructor, United International College, Hong Kong, China
2019/1 - 2020/12 Co-Supervisor	Yogesh Pawar (Completed) , Concordia University Thesis/Project Title: Machine learning for intrusion detection Present Position: Research associate, Université de Montreal

Doctorate [n=6]

2022/1 - 2025/12 Principal Supervisor	Jiaxun Guo (In Progress) , Concordia University Student Degree Expected Date: 2025/12 Thesis/Project Title: Deep generative models for energy applications Present Position: PhD student
2020/9 - 2024/8 Co-Supervisor	Viet Tra (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: Explainable machine learning models for outliers removal, anomaly detection, and HVAC systems diagnosis Present Position: PhD student
2020/9 - 2023/9 Co-Supervisor	Nana Kofi Baabu Twum Duah (Completed) , Institut National Polytechnique de Grenoble Thesis/Project Title: Theoretical and practical implementation of Model Predictive Controller in industrial environments Present Position: Postdoctoral Fellow, INRIA
2020/1 - 2023/12 Co-Supervisor	Soroush Samareh Abolhassani (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Machine learning for Urban Scale Building Energy Modeling Present Position: PhD student
2019/9 - 2023/3 Co-Supervisor	Kamal Maanicshah, (Completed) , Concordia University Thesis/Project Title: Novel Mixture Allocation Models for Topic Learning Present Position: Data Scientist Busspass Inc. Montreal
2019/1 - 2023/5 Co-Supervisor	Hussein Albazzaz (Completed) , Concordia University Thesis/Project Title: Mixture-Based Clustering and Hidden Markov Models for Energy Management and Human Activity Recognition: Novel Approaches and Explainable Applications Present Position: Unknown

International Collaboration Activities

2919/1 - 2024/12	Research Collaborator, Portugal I started this collaboration thanks to the Pessoa program (https://www.campus france.org/fr/pessoa). I extensively collaborated with WattIs company (https://watt-is.com) and Dr. Carlos Augusto Santos Silva to analyse how load disaggregation can improve interactive learning (by generating new features) of consumer practices.
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2018/2 - 2018/6 Research Collaborator, Netherlands
I collaborated with QUBY company (<https://www.quby.com>) in order to develop optimal control solutions to improve QUBY's control system applied for both high and low efficient buildings, and development of advanced capabilities for smart thermostats.

Committee Memberships

2024/2 - 2026/12 Committee Member, International Conference on Intelligent Information Technology (ICIIT 2024), ACM
2019/1 - 2022/12 Committee Member, International Conference on Developments in eSystems Engineering (DeSE), IEEE

Other Memberships

2023/1 Master's and PhD theses committees, Concordia University
2021/9 - 2022/12 Member of the International relations committee, Institut national polytechnique de Grenoble
2020/9 - 2022/12 Master's and PhD theses committees, Institut national polytechnique de Grenoble

Publications

Journal Articles

1. O. Dalhoumi*, N. Bouguila, M. Amayri and W. Fan. (2023). Bayesian Matrix Factorizations for Semi-Bounded Data. IEEE Transactions on Neural Networks and Learning Systems. 34(6): 3111 - 3123.
Published
Refereed?: Yes, Open Access?: No
2. A. Rebei*, M. Amayri and N. Bouguila. (2023). FSNet: A Hybrid Model for Seasonal Forecasting. IEEE Transactions on Emerging Topics in Computational Intelligence, <https://doi.org/10.1109/TETCI.2023.3290050>.
In Press
Refereed?: Yes, Open Access?: No
3. J. Guo*, M. Amayri, N. Bouguila and W. Fan. (2023). Liouville-Based Predictive Models for Occupancy Estimation Using Small Training Data. IEEE Internet of Things Journal, DOI: 10.1109/JIOT.2023.3289337.
In Press
Refereed?: Yes, Open Access?: No
4. M. Akbar*, M. Amayri, N. Bouguila. (2023). A novel non-intrusive load monitoring technique using semi-supervised deep learning framework for smart grid. Building Simulation.
Accepted
Refereed?: Yes, Open Access?: No
5. J. Dridi*, M. Amayri, N. Bouguila. (2023). Unsupervised domain adaptation with and without access to source data for estimating occupancy and recognizing activities in smart buildings. Building and Environment. 246(110651)
Published
Refereed?: Yes, Open Access?: No

6. A. Al-gumaei*, M. Azam, M. Amayri, N. Bouguila. (2023). ICA and IVA bounded multivariate generalized Gaussian mixture based hidden Markov models. *Engineering Applications of Artificial Intelligence*. 123: 106345.
Published
Refereed?: Yes, Open Access?: No
7. H. Al-Bazzaz*, M. Azzam*, M. Amayri and N. Bouguila. (2023). Unsupervised Mixture Models on the Edge for Smart Energy Consumption Segmentation with Feature Saliency. *Sensors*. 23(No. 19): Article 8296.
Published
Refereed?: Yes, Open Access?: No
8. Z. Luo*, M. Amayri, W. Fan, K. Ihou, N. Bouguila,. (2023). Parallel Inference for Cross-Collection Latent Generalized Dirichlet Allocation Model and Applications. *Expert Systems With Applications* <https://doi.org/10.1016/j.eswa.2023.121720>.
Accepted
Refereed?: Yes, Open Access?: No
9. Z. Luo*, M. Amayri and W. Fan, N. Bouguila. (2023). Cross-Collection Latent Beta-Liouville Allocation Model Training with Privacy Protection and Applications. *Applied Intelligence*. 53: 17824–17848.
Published
Refereed?: Yes
10. J. Guo*, M. Amayri, F. Najar, W. Fan and N. Bouguila. (2023). Occupancy Estimation in Smart buildings using predictive modeling in imbalanced domains. *Journal of Ambient Intelligence and Humanized Computing*. 14(8): 1868-5145.
Published
Refereed?: Yes, Open Access?: No
11. J. B. Silva*, M. Amayri, S. Ploix, P. Reignier and C. S. Silva. (2022). Cooperative and Interactive Learning to Estimate Human Behaviours for Energy Applications. *Energy and Buildings*. 258: Article 111727.
Published
Refereed?: Yes, Open Access?: No
12. V. Tra*, M. Amayri and N. Bouguila. (2022). Unsupervised Outlier Detection using Neural Network-Based Mixtures of Probabilistic Principal Component Analyzers for Building Chiller Fault. *Building and Environment*. 225: Article 109620.
Published
Refereed?: Yes, Open Access?: No
13. M. Payet*, M. David, P. Laurent, M. Amayri, S. Ploix and F. Garde. (2022). Modelling of Occupant Behavior in Non-residential Mixed-Mode Buildings: The Distinctive Features of Tropical Climate. *Energy and Buildings*. 259: Article 111895.
Published
Refereed?: Yes, Open Access?: No
14. V. Tra*, M. Amayri, and N. Bouguila. (2022). Outlier Detection Via Multiclass Deep Autoencoding Gaussian Mixture Model for Building Chiller Diagnosis. *Energy and Buildings*. 259: Article 111893.
Published
Refereed?: Yes, Open Access?: No
15. S. Samareh Abolhassani*, A. Zandifar, N. Ghourchian, M. Amayri, N. Bouguila, and U. Eicker. (2022). Improving Residential Building Energy Simulations Through Occupancy Data Derived From Commercial Off-the-Shelf Wi-Fi Sensing Technology. *Energy and Buildings*. 272: Article 112354.
Published
Refereed?: Yes, Open Access?: No

16. S. Samareh Abolhassani*, M. Amayri, N. Bouguila, and U. Eicker. (2022). A New Workflow for Detailed Urban Scale Building Energy Modeling using Spatial Joining of Attributes for Archetype Selection. *Journal of Building Engineering*. 46: Article 103661.
Published
Refereed?: Yes, Open Access?: No
17. M. Amayri, C. S. Silva, H. Pombeiro and S. Ploix. (2022). Flexibility Characterization of Residential Electricity Consumption: a machine learning approach. *Sustainable Energy, Grids and Networks*.32: Article 100801.
Published
Refereed?: Yes, Open Access?: No
18. K. Ihou*, M. Amayri and N. Bouguila. (2022). Stochastic Variational Optimization of a Hierarchical Dirichlet Process Latent Beta-Liouville Topic Model. *ACM Transactions on Knowledge Discovery from Data*. 16(5): Article 84,.
Published
Refereed?: Yes, Open Access?: No
19. J. Dridi*, M. Amayri and N. Bouguila,. (2022). Transfer Learning for Estimating Occupancy and Recognizing Activities in Smart Buildings. *Building and Environment*. 217: Article 109057.
Published
Refereed?: Yes, Open Access?: Yes
20. O. Bouhamed*, M. Amayri, and N. Bouguila. (2022). Weakly Supervised Prediction using Training Data Collected via Interactive Learning. *Sensors*. 22(9): Article 3186.
Published
Refereed?: Yes, Open Access?: Yes
21. J. Guo*, M. Amayri, N. Bouguila and W. Fan. (2021). A Hybrid of Interactive Learning and Predictive Modeling for Occupancy Estimation in Smart Buildings. *IEEE Transactions on Consumer Electronics*. 67(4): 285-293.
Published
Refereed?: Yes, Open Access?: No
22. B. F. Balouch*, M. Amayri, N. Bouguila and U. Eicker,. (2021). On Short-Term Load Forecasting Using Machine Learning Techniques and a Novel Parallel Deep LSTM-CNN Approach. *IEEE Access*. 9: 31191-31212.
Published
Refereed?: Yes, Open Access?: Yes
23. K. Maanicshah*, M. Amayri, N. Bouguila, and W. Fan. (2021). Unsupervised Learning using Variational Inference on Finite Inverted Dirichlet Mixture Models with Component Splitting. *Wireless Personal Communications*. 119: 1817-1844.
Published
Refereed?: Yes, Open Access?: No
24. M. Amayri, S. Ploix, N. Bouguila and F. Wurtz. (2020). Database Quality Assessment for Interactive Learning: Application to Occupancy Estimation. *Energy and Buildings*. 209: Article 109578.
Published
Refereed?: Yes, Open Access?: No
25. M. Amayri, S. Ploix, N. Bouguila, and F. Wurtz. (2020). Estimating Occupancy using Interactive Learning with a Sensor Environment: Real-Time Experiments. *IEEE Access*. 7(1): 53932-53944.
Published
Refereed?: Yes, Open Access?: Yes

26. R. Nasfi*, M. Amayri and N. Bouguila. (2020). A Novel Approach for Modeling Positive Vectors with Inverted Dirichlet-Based Hidden Markov Models. Knowledge-Based Systems. 192: Article 105335.
Published
Refereed?: Yes, Open Access?: No
27. M. Amayri, S. Ploix, H. Kazimi, Q. Ngo, and A. Safadi. (2019). Estimating Occupancy from Measurements and Knowledge Using Bayesian Network for Energy Management. Journal of Sensors. 2019
Published
Refereed?: Yes, Open Access?: Yes

Books

1. N. Bouguila, W. Fan, and M. Amayri. (2022). Hidden Markov Models and Applications, Unsupervised and Semi-Supervised learning. ISBN 978-3-030-99142-5
Published, Springer
Refereed?: Yes
2. S. Ploix, M. Amayri and N. Bouguila. (2021). Towards Energy Smart Homes: Algorithms, Technologies and Applications. ISBN 978-3-030-76476-0
Published, Springer
Refereed?: Yes

Book Chapters

1. M. Amayri, S. Ali and N. Bouguila. (2022). Machine Learning for Activity Recognition in Smart Buildings. S. Ploix, M. Amayri and N. Bouguila,. Towards Energy Smart Homes: Algorithms, Technologies and Applications. : 199-229.
Published, Springer
Refereed?: Yes
2. W. Hou, W. Fan, M. Amayri and N. Bouguila. (2022). A Novel Continuous Hidden Markov Model for Modeling Positive Sequential Data. N. Bouguila, W. Fan and M. Amayri. Hidden Markov Models and Applications. : 199-210.
Published, Springer
Refereed?: Yes
3. C. A. Santos Silva, M. Amayri and K. Basu. (2022). Characterizations of Energy Demand and Energy Services Using Model-Based and Data-Driven Approaches. S. Ploix, M. Amayri and N. Bouguila. Towards Energy Smart Homes: Algorithms, Technologies and Applications. : 229-248.
Published, Springer
Refereed?: Yes
4. Z. Xian*, M. Azam*, M. Amayri, W. Fan and N. Bouguila. (2022). Bounded Asymmetric Mixture-Based Hidden Markov Models. N. Bouguila, W. Fan and M. Amayri. Hidden Markov Models and Applications. : 33-58.
Published, Springer
Refereed?: Yes

Conference Publications

1. J. Dridi*, M. Amayri and N. Bouguila. (2024). Unsupervised Adversarial Domain Adaptation for Estimating Occupancy and recognizing Activities in Smart Buildings. 9th International Conference on Intelligent Information Technology (ICIIT 2024),
Paper
Accepted
Refereed?: Yes, Invited?: No

2. M. Dissem*, M. Amayri and N. Bouguila. (2024). Robust Interactive HMI for Occupancy Estimation in Smart Buildings. IEEE Concumser Communication & Networking Conference (ICCNC 2024),
Paper
Published
Refereed?: Yes, Invited?: No
3. O. Sghaier*, M. Amayri and N. Bouguila. (2024). Data Clustering with Libby-Novick Beta-Liouville Mixture Models: A Minimum Message Length Approach. 9th International Conference on Intelligent Information Technology (ICIIT 2024),
Paper
Accepted
Refereed?: Yes, Invited?: No
4. H. AL-Bazzaz*, M. Azam, M. Amayri, N. Bouguila. (2023). Enhancing Human Action Recognition with Asymmetric Generalized Gaussian Mixture Model-Based Hidden Markov Models and Bounded Support. IEEE International Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
5. H. Al-Bazzaz*, M. Azam, M. Amayri, and N. Bouguila. (2023). Refining Nonparametric Mixture Models with Explainability for Smart Building Applications. IEEE International Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
6. M. Bouzid*, M. Amayri, N. Bouguila. (2023). Addressing Load Forecasting Challenges in Industrial Environments Using Time Series Deep Models. 6th International Conference on Computational Intelligence and Intelligent Systems (CIIS 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
7. H. Al-Bazzaz*, M. Azam, M. Amayri, and N. Bouguila. (2023). Enhanced Energy Characterization and Feature Selection using explainable Non-parametric AGGMM. 15th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
8. M. Akbar*, M. Amayri, N. Bouguila, F. Wurtz, B. Delinchant. (2023). Assessing the Effectiveness of Supervised and Semi-supervised NILM Approaches in an Industrial Context. 6th International Conference on Computational Intelligence and Intelligent Systems (CIIS 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
9. H. Al-Bazzaz*, M. Azam, M. Amayri, and N. Bouguila. (2023). Explainable Robust Smart Meter Data Clustering for Improved Energy Management. IEEE International Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No

10. F. Rezapoor Nikroo*, M. Amayri, and N. Bouguila. (2023). HMMs Recursive Parameter Estimation for Semi-Bounded Data Modeling: Application to Occupancy Estimation in Smart Buildings. International Conference on Smart Cities and Green ICT Systems (SMARTGREENS 2023), (81-88)
Paper
Published
Refereed?: Yes, Invited?: No
11. Z. Luo*, M. Amayri, W. Fan, N. Bouguila. (2023). A Selective Supervised Latent Beta-Liouville Allocation for Document Classification. 36th International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems, IEA/AIE 2023, (37-48)
Paper
Published
Refereed?: Yes, Invited?: No
12. K. Maanicshah*, M. Amayri and N. Bouguila. (2023). Novel Topic Models for Content Based Recommender Systems. 25th International Conference on Enterprise Information Systems (ICEIS 2023), (138-145)
Paper
Published
Refereed?: Yes, Invited?: No
13. H. Barkous*, M. Amayri and N. Bouguila. (2023). A Comprehensive Analysis of a Hybrid Deep Learning Model for Midterm Electric Load Forecasting. IEEE International Conference on Smart City (Smart City-2023),
Paper
Published
Refereed?: Yes, Invited?: No
14. O. Sghaier*, M. Amayri, and N. Bouguila. (2023). Multivariate Beta Normality Scores Approach for Deep Anomaly Detection in Images Using Transformations. IEEE International Conference on Systems, Man, and Cybernetics (SMC 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No
15. V. Tra*, H. Al-Bazzaz*, M. Amayri, and N. Bouguila. (2023). Unsupervised Anomaly Detection using Deep Autoencoding Mixture of Probabilistic Principal Component Analyzers. 8th International Conference on Intelligent Information Technology, ICIT '23, (203–208)
Paper
Published
Refereed?: Yes, Invited?: No
16. M. K. Akbar*, M. Amayri, N. Bouguila. (2023). Deep Learning Based Solution for Appliance Operational State Detection and Power Estimation in Non-Intrusive Load Monitoring. 36th International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems, IEA/AIE 2023,
Paper
Accepted
Refereed?: Yes, Invited?: No
17. M. Amayri and Y. Pawar*. (2023). Occupancy Estimation in Smart Buildings: Impact of Data Quality on Feature Selection. 6th International Conference on Computational Intelligence and Intelligent Systems (CIIS 2023),
Paper
Accepted
Refereed?: Yes, Invited?: No

18. K. Maanicshah*, N. Manouchehri, M. Amayri, and N. Bouguila. (2023). Novel Topic Models for Parallel Topics Extraction from Multilingual Text. 15th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2023), (297-309)
Paper
Published
Refereed?: Yes, Invited?: No
19. F. Rezapoor Nikroo*, M. Amayri and N. Bouguila. (2022). Recursive Parameter Estimation of Generalized Dirichlet Hidden Markov Models: Application to Occupancy Estimation in Smart Buildings. IEEE International Conference on Industry 4.0, Artificial Intelligence, and Communication Technology (IAICT 2022), (90-96)
Paper
Published
Refereed?: Yes, Invited?: No
20. N. Twum-Duah*, M. Amayri, S. Ploix, and F. Wurtz. (2022). Optimal Sizing of Stationary Battery Storage Taking into Account Indirect Flexibility in Tertiary Buildings: Use case of an Electric Vehicle Community. CIRED Porto Workshop 2022 E-mobility and power distribution systems, (518-522)
Paper
Published
Refereed?: Yes, Invited?: No
21. W. Fan, M. Amayri and N. Bouguila. (2022). Stochastic Expectation Propagation Learning for Unsupervised Feature Selection. 14th International Conference on Computational Collective Intelligence (ICCCI 2022), (674-686)
Paper
Published
Refereed?: Yes, Invited?: No
22. K. Prabhakaran*, J. Dridi*, M. Amayri and N. Bouguila. (2022). Explainable K-Means Clustering for Occupancy Estimation. The 12th International Conference on Sustainable Energy Information Technology (SEIT), (326-333)
Paper
Published
Refereed?: Yes, Invited?: No
23. F. Rezapoor Nikroo*, M. Amayri and N. Bouguila. (2022). Recursive Parameter Estimation on Beta-Liouville Hidden Markov Models. International Conference on Electrical, Computer and Energy Technologies (ICECET 2022), (1-7)
Paper
Published
Refereed?: Yes, Invited?: No
24. E. Alvarez*, M. Amayri, S. Ploix, and P.Reignier. (2022). Apprentissage interactif et coopératif pour l'experimentation de son chez-soi. IBPSA France, International Building Performance Simulation Association. [Received Best Poster Award],
Paper
Published
Refereed?: Yes, Invited?: No
25. K. Maanicshah*, M. Amayri and N. Bouguila,. (2022). Improving Topic Quality with Interactive Beta-Liouville Mixture Allocation Model. IEEE Symposium Series on Computational Intelligence (SSCI 2022), (1143-1148)
Conference Date: 2022/12
Paper
Published
Refereed?: Yes, Invited?: No

26. J. Guo*, M. Amayri, W. Fan and N. Bouguila. (2022). Beta-Liouville and Inverted Beta-Liouville Based Predictive Models for Occupancy Detection using Small Training Data. IEEE Symposium Series on Computational Intelligence (SSCI 2022), (223-230)
Conference Date: 2022/12
Paper
Published
Refereed?: Yes, Invited?: No
27. O. Dalhoumi*, M. Amayri and N. Bouguila. (2022). A Review of Neural Networks for Buildings Occupancy Measurement. IEEE International Conference on Industry 4.0, Artificial Intelligence, and Communication Technology (IAICT 2022), (29-35)
Conference Date: 2022/7
Paper
Published
Refereed?: Yes, Invited?: No
28. J. Guo*, M. Amayri, W. Fan and N. Bouguila. (2022). A Generalized Inverted Dirichlet Predictive Model for Activity Recognition using Small Data, [Received Best Paper Award]. 35th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2022), (431-442)
Conference Date: 2022/7
Paper
Published
Refereed?: Yes, Invited?: No
29. O. Bouhamed*, M. Amayri and N. Bouguila. (2022). T-DPnet: transformer-Based Deep Probabilistic Network for Load Forecasting. 8th International Conference on Time Series and Forecasting (ITISE 2022),
Conference Date: 2022/6
Paper
Published
Refereed?: Yes, Invited?: No
30. Y. Pawar*, M. Amayri and N. Bouguila. (2022). An Accelerated Nonparametric Bayesian Approach for Anomaly Detection with Feature Selection. International Electrical Engineering Congress (iEECON2022), (1-4)
Conference Date: 2022/3
Paper
Published
Refereed?: Yes, Invited?: No
31. O. Graja*, F. Najar*, M. Amayri, and N. Bouguila. (2021). Inverted Dirichlet State Space Model for Time Series Forecasting. 30th IEEE International Symposium on Industrial Electronics (ISIE 2021), (1-6)
Paper
Published
Refereed?: No, Invited?: Yes
32. A. Rebei*, O. Dalhoumi*, N. Manouchehri*, A. Baghdadi*, M. Amayri and N. Bouguila. (2021). Variational Learning of the Mixture of Shifted-Scaled Dirichlet Distributions via Entropy Splitting. International Symposium on Networks, Computers and Communications (ISNCC), (75-78)
Conference Date: 2021/11
Paper
Published
Refereed?: No, Invited?: Yes

33. Z. Xian*, M. Azam, M. Amayri, and N. Bouguila. (2021). Model Selection Criterion for Multivariate Bounded Asymmetric Gaussian Mixture Model. 29th European Conference on Signal Processing (EUSIPCO2021), (1436-1440)
Conference Date: 2021/8
Paper
Published
Refereed?: Yes, Invited?: No
34. N. Manouchehri*, O. Dalhoumi*, M. Amayri, and N. Bouguila. (2021). Online Variational Learning of Shifted Scaled Dirichlet Mixture. The 30th IEEE International Symposium on Industrial Electronics (ISIE 2021), (1-6)
Conference Date: 2021/6
Paper
Published
Refereed?: Yes, Invited?: No
35. M. S. Ahmadzadeh*, N. Manouchehri*, H. Ennajari, M. Amayri, N. Bouguila and W. Fan. (2021). Entropy-Based Variational Learning of Finite Inverted Beta-Liouville Mixture Model. 34rd International FLAIRS Conference (FLAIRS-34),
Conference Date: 2021/5
Paper
Published
Refereed?: No, Invited?: Yes
36. Y. Pawar*, M. Amayri and N. Bouguila. (2021). Performance Evaluation of Adversarial Learning for Anomaly Detection using Mixture Models. 22nd IEEE International Conference on Industrial Technology (IEEE ICIT 2021), (913-918)
Conference Date: 2021/3
Paper
Published
Refereed?: Yes, Invited?: No
37. Y. P. Pawar*, M. Amayri and N. Bouguila. (2020). Performance Evaluation of Geometric Area Analysis Technique for Anomaly Detection Using Trapezoidal Area Estimation. International Symposium on Networks, Computers and Communications (ISNCC),
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
38. N. Manouchehri*, O. Dalhoumi*, M. Amayri and N. Bouguila. (2020). Variational Learning of a Shifted Scaled Dirichlet Model with Component Splitting Approach. 3rd IEEE International Conference on Artificial Intelligence for Industries (AI4I), (75-78)
Conference Date: 2020/9
Paper
Published
Refereed?: Yes, Invited?: No
39. M. Amayri, S. Ploix, F. Najar, N. Bouguila, and F. Wurtz. (2020). A Statistical Process Control Chart Approach for Occupancy Estimation in Smart Buildings. IEEE Symposium Series on Computational Intelligence (SSCI 2019), (1729-1734)
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No

40. N. Kofi*, M. Amayri, F. Wurtz, S. Ploix. (2019). Evaluation of Energetic Performance of Net Zero Energy Buildings. 2019 IEEE International Smart Cities Conference (ISC2 2019), (136-142)
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
41. H. Nguyen*, M. Rahmanpour*, N.Manouchehri*, K. Mannichah*, M. Amayri, and N. Bouguila. (2019). A Statistical Approach for Unsupervised Occupancy Detection and Estimation in Smart Buildings. 2019 IEEE International Smart Cities Conference (ISC2 2019), (414-419)
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
42. J. Goffart, M.Woloszyn, X. Faure, F. Wurtz, M. Amayri, S. Ploix, P. Schneuwly. (2019). Overview of a Large Scale Monitoring Project of Energy Positive Houses: Complementarity Between Simulations and Measurements. 16th IBPSA International Conference and Exhibition (BS 2019),
Conference Date: 2019/9
Paper
Published
Refereed?: No, Invited?: Yes
43. N. Zamzami, M. Amayri, N. Bouguila, and S. Ploix. (2019). Online Clustering for Estimating Occupancy in an Office Setting. 28th IEEE International Symposium on Industrial Electronics (ISIE 2019), (2195-2200)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
44. N. Manouchehri*, J. S. Kalsi*, M. Amayri, and N. Bouguila. (2019). Finite Two-Dimensional Beta Mixture Model Selection and Applications. 28th IEEE International Symposium on Industrial Electronics (ISIE 2019), (1407-1412)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
45. M. Amayri, H. Haller, S. Ploix, F. Wurtz, and G. Debizet. (2019). Indicators for self-assessment of human practices in homes. 8th International Conference on Smart Cities and Green ICT Systems (SMARTGREENS 2019), (116-122)
Conference Date: 2019/5
Paper
Published
Refereed?: Yes, Invited?: No
46. F. Alalyan*, N. Zamzami, M. Amayri, and N. Bouguila. (2019). An Improved K-Medoids Algorithm Based on Binary Sequences Similarity Measures. 6th International Conference on Control, Decision and Information Technologies (CODIT 2019), (1723-1728)
Conference Date: 2019/4
Paper
Published
Refereed?: No, Invited?: Yes

47. D. Ankam*, N. Bouguila, and M. Amayri. (2019). Beta-Liouville Regression and Applications. 6th International Conference on Control, decision and Information Technologies (CODIT 2019), (1740-1745)
Conference Date: 2019/4
Paper
Published
Refereed?: Yes, Invited?: No
48. M. Amayri, H. Kazimi, and S. Ploix. (2018). Decision tree and Parametrized classifier for Estimating occupancy in energy management. 5th International Conference on Control, Decision and Information Technologies (CODIT 2018), (397-402)
Conference Date: 2018/4
Paper
Published
Refereed?: Yes, Invited?: No
49. M. Amayri, H. Kazimi, and S. Ploix. (2018). Estimating occupancy in residential context using Bayesian Networks for energy management. 20th International Conference on Machine Learning for Prediction and Control (ICMLPC 2018),
Conference Date: 2018/2
Paper
Published
Refereed?: Yes, Invited?: No

Date Submitted: 2023-10-13 10:33:24

Confirmation Number: 1678293

Template: NSERC_Researcher

Professor Chadi Assi

Correspondence language: English

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Protected when completed

Professor Chadi Assi

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	No

Degrees

- 2003/4 Doctorate, Electrical Engineering, City Univ of New York-Grad School & Univ. Ctr
- 2001/12 Master's Thesis, Electrical Engineering, City Univ of New York-Grad School & Univ. Ctr
- 1997/8 Bachelor's, Electrical Engineering, Université Libanaise

Recognitions

- 2023/4 Concordia Valedictorian - 2,000
Concordia University
Honor
My former PhD student Mohamad El Hattab received the Concordia University Distinguished Doctoral Dissertation Prize – engineering category.
- 2023/2 Concordia University President Media Outreach Award
Concordia University
Honor
Media Outreach Award
- 2022/4 - 2027/5 Concordia University Research Chair, Tier 1 - 100,000
Concordia University
Honor
Research chair provided by Concordia.
- 2020/9 IEEE Fellow
IEEE
Honor
IEEE Fellow is the highest grade of membership and is recognized by the technical community as a prestigious honor and an important career achievement.
- 2020/8 Provost Circle of Distinction
Concordia University
Distinction
Award given to only few members of the academic body of the university for outstanding achievement.

- 2020/5 Governor General Gold Medal Award (Technology, Industry and the Environment category)
Concordia University
Honor
My former PhD student Dr Mohanad Chariti received this award for best PhD thesis.
- 2018/5 Doctoral Prize In Engineering and Computer Science
Concordia University
Honor
My former PhD student Dr Mosaddek Hossain Kamal Tushar received this award for best PhD thesis in the faculty of engineering and computer science for excellence in research under my supervision.
- 2017/5 - 2022/4 Concordia University Research Chair, Tier 1
Concordia University
Honor
Concordia University Research Chair, Tier II, in the area Advanced Internet Technologies.

User Profile

Research Specialization Keywords: Data centers and cloud networks, Network security, Optical Networks, Optimization, Performance analysis and modeling, Resource allocation, Routing and Dimensioning, Wireless Networks

Employment

- 2013/6 Full professor
CIISE, Concordia University
Full-time
Tenure Status: Tenure
- 2007/5 - 2013/5 Associate Professor
CIISE, Engineering, Concordia University
Full-time
Tenure Status: Tenure
- 2011/5 - 2012/6 Graduate Program Director
CIISE, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2009/9 - 2010/6 Visiting professor
Computer Engineering, Kuwait University
Full-time
Tenure Status: Non Tenure Track
Teaching and Research
- 2003/8 - 2007/5 Assistant Professor
Engineering and Computer Science, Concordia University
Full-time
Tenure Status: Tenure Track
- 2002/9 - 2003/7 Visiting Researcher
Nokia Research Center, Nokia Research Center
- 2000/8 - 2000/12 Research Assistant
Optical Research Group, Telcordia Technologies (BELLCORE)

2000/6 - 2000/8 Summer Research Student
Optical R&D Lab, Sorrento Networks

Research Funding History

Awarded [n=9]

2022/5 - 2027/4
Principal Investigator Concordia University Research Chair Tier I in Future Cellular Networks”, Research Chair
Funding Sources:
Concordia University
Concordia Chair
Total Funding - 100,000
Portion of Funding Received - 100,000
Funding Competitive?: Yes

2021/6 - 2026/5
Principal Applicant Toward Intelligent and Resilient Smart Cities with Energy-Vehicle-Human Interactions, Grant
Funding Sources:
Canada Foundation for Innovation (CFI)
Total Funding - 1,800,000
Portion of Funding Received - 1,800,000
Funding Competitive?: Yes
Co-applicant : Amr Youssef; Arash Mohammadi; Jun Yan; Mohsen Ghafouri; Mourad Debbabi; Walter Lucia

2022/1 - 2025/12
Co-applicant 5G network security, Anomaly detection, DDOS, Grant
Funding Sources:
National Consortium for Cyber Security
Total Funding - 1,000,000
Portion of Funding Received - 1,000,000
Funding Competitive?: Yes
Co-applicant : Lingyu Wang; Suryadipta Majumdar;
Principal Investigator : Mourad Debbabi

2022/4 - 2025/3
Principal Applicant Large scale integration of EVs into the smart grid : A comprehensive cyber physical study and security assessment, Grant
Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Alliance
Total Funding - 193,500
Portion of Funding Received - 193,500
Funding Competitive?: Yes

2019/5 - 2024/4
Principal Investigator Enabling Technologies for hyperconnected, data driven, and service oriented networks of the future, Grant
Funding Sources:
NSERC
Discovery grant
Total Funding - 200,000
Portion of Funding Received - 100
Funding Competitive?: Yes

2022/1 - 2023/7 STRAT Large Scale Data Center Networks, Grant

Principal Applicant	<p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Total Funding - 250,000 Portion of Funding Received - 250,000 Funding Competitive?: Yes</p>
2020/8 - 2022/5 Co-applicant	<p>5G, autonomous, intelligence, robotics, Grant</p> <p>Funding Sources: Mitacs - Cienna Total Funding - 60,000 Portion of Funding Received - 100 Funding Competitive?: Yes</p>
2017/5 - 2020/4 Principal Applicant	<p>Sécurité au Niveau de la Couche Physique pour Lutter Contre les Menaces de Sécurité dans les Systèmes sans Fil, Grant</p> <p>Funding Sources: Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) Equipe Total Funding - 205,740 Portion of Funding Received - 144,018 Funding Competitive?: Yes</p> <p>Co-applicant : Leszek Szczecinski</p>
2014/5 - 2019/4 Principal Applicant	<p>Efficient, Scalable and Survivable Design for next generation Virtualized Data Center for Cloud Services, Grant</p> <p>Funding Sources: NSERC Discovery grant Total Funding - 255,000 Portion of Funding Received - 255,000 Funding Competitive?: Yes</p>
Completed [n=4]	
2022/1 - 2022/12 Principal Applicant	<p>HTTP/2 anomaly detection in 5G service-based architecture, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Total Funding - 30,000 Portion of Funding Received - 30,000 Funding Competitive?: Yes</p>
2017/5 - 2022/4 Principal Applicant	<p>Concordia University Research Chair (Tier I) in Advanced Internet Technologies, Research Chair</p> <p>Funding Sources: Concordia University Concordia Chair Total Funding - 100,000 Portion of Funding Received - 100,000 Funding Competitive?: Yes</p>
2018/5 - 2021/4 Co-applicant	<p>Vers une gestion efficace des ressources dans les réseaux d'accès radio des prochaines générations des réseaux mobiles, Grant</p> <p>Funding Sources: FQRNT</p>

Team Grant
 Total Funding - 162,000
 Portion of Funding Received - 54,000
 Funding Competitive?: Yes
 Co-applicant : Tho Le Ngoc;
 Principal Applicant : Wessam Ajib

2019/8 - 2020/7
 Principal Applicant

Simulator for studying the Impact of EV charging on power grid, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
 Engage
 Total Funding - 25,000
 Portion of Funding Received - 100
 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=13]

2023/5 - 2024/12 Principal Supervisor	Ahmad Alayan (In Progress) , Concordia University Student Degree Expected Date: 2025/1 Thesis/Project Title: 5G network security Present Position: Student
2023/1 - 2024/12 Principal Supervisor	Youssef Maghrebi (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Digital Twin, AI, 6G Present Position: Student
2023/1 - 2024/12 Principal Supervisor	Rinith Reghunath (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Cyber Security Monitoring, EV ecosystem, Distribution Present Position: Student
2021/9 - 2023/8 Principal Supervisor	Mohammad Adraa (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Data Center networks Present Position: MASc student
2020/9 - 2022/3 Principal Supervisor	Samer Fayad (In Progress) , Concordia University Thesis/Project Title: Visible Light Communications. Present Position: MASc student
2020/1 - 2021/8 Principal Supervisor	Tony Nasr (Completed) , Concordia University Thesis/Project Title: EV charging infrastructure security and CPS security. Present Position: MASc student
2019/1 - 2021/12 Principal Supervisor	Mirabelle Dib (Completed) , Concordia University Thesis/Project Title: IOT security, Malware Present Position: MASc student, CGI
2019/1 - 2021/8 Principal Supervisor	Shirin Rezasoltani (Completed) , Concordia University Thesis/Project Title: Age of Information in Cellular Systems Present Position: MASc student, Ottawa

- 2018/8 - 2020/5
Principal Supervisor
Houssam El Houssini (Completed) , Concordia University
Thesis/Project Title: EV security, cyber security, IoT security
Present Position: MASc student
- 2018/8 - 2020/5
Principal Supervisor
Joseph Antoun (Completed) , Concordia University
Thesis/Project Title: Vehicular networks, self organized networks, 5G.
Present Position: MASc student
- 2018/1 - 2020/1
Principal Supervisor
Huu Phuc (Completed) , Concordia University
Thesis/Project Title: Next generation wireless networks, UAVs, Caching
Present Position: PhD student
- 2017/9 - 2019/5
Principal Supervisor
Nouha Kheraf (Completed) , Concordia University
Thesis/Project Title: Mobile edge computing, IoTs
Present Position: MASc student
- 2017/1 - 2018/1
Principal Supervisor
Amine Arfaoui (Completed) , Concordia University
Thesis/Project Title: Physical Layer security in Visible Light Communications
Present Position: PhD student, Concordia University

Doctorate [n=25]

- 2023/1 - 2026/1
Principal Supervisor
Yefei Zhang (In Progress) , Concordia
Student Degree Expected Date: 2025/1
Thesis/Project Title: Adversarial attacks, machine learning, Explainability, IoT malware
Present Position: Student
- 2022/9 - 2026/12
Principal Supervisor
Ali Amhaz (In Progress) , Concordia University
Student Degree Expected Date: 2025/4
Thesis/Project Title: 5G networks, Multiple Access, Integrated Sensing and Communications
Present Position: PhD student
- 2022/9 - 2025/1
Principal Supervisor
Mahdi Soleymani (In Progress) , Concordia University
Student Degree Expected Date: 2025/1
Thesis/Project Title: Control theoretic approaches for attack detection in EV charging
Present Position: PhD student
- 2022/9 - 2024/12
Co-Supervisor
Ahmadreza Abazari (In Progress) , concordia University
Student Degree Expected Date: 2025/1
Thesis/Project Title: Smart Grids, EV Ecosystem, Security
Present Position: Student
- 2021/9 - 2025/8
Principal Supervisor
Shreya Kisha (In Progress) , Concordia University
Student Degree Expected Date: 2025/1
Thesis/Project Title: Rate Splitting Multiple Access in 6G
Present Position: PhD student
- 2021/9 - 2025/8
Principal Supervisor
Nassr AL-DAHABREH (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Modeling and learning EV traffic profile.
Present Position: PhD student
- 2021/5 - 2024/12
Principal Supervisor
Nathalie Wehbe (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Cyber security, IoT
Present Position: PhD student

2020/9 - 2024/1 Principal Supervisor	Mohammad Sayed (In Progress) , Concordia University Thesis/Project Title: Cyber Physical Systems, Electrical Vehicles, Security Present Position: PhD student
2020/9 - 2024/3 Principal Supervisor	Khaled Saredidine (In Progress) , Concordia University Thesis/Project Title: Cyber security, EVs, Present Position: PhD student
2019/8 - 2022/12 Principal Supervisor	Ricardo Ayala (In Progress) , Concordia University Student Degree Expected Date: 2025/12 Thesis/Project Title: Ransomware Present Position: PhD student
2018/9 - 2022/4 Principal Supervisor	Mohammad Kadry (Completed) , Concordia University Thesis/Project Title: NOMA, Joint Transmissions, Multicell, RIS Present Position: Ericsson Ottawa
2018/9 - 2022/5 Principal Supervisor	Mohamed Al Mekhlafi (Completed) , Concordia University Thesis/Project Title: 5G and beyond, wireless access Present Position: Postdoc, REMI - ETS
2018/1 - 2022/5 Principal Supervisor	Amine Arfaoui (Completed) , Concordia University Thesis/Project Title: Visible Light Communications, security, modeling Present Position: Interdigital
2018/1 - 2021/1 Principal Supervisor	Moataz Shokry (Completed) , Concordia University Thesis/Project Title: UAVs, next generation networks, vehicular networks, 5G. Present Position: RBC
2018/1 - 2021/5 Principal Supervisor	Ahmed Mahdi (Completed) , Concordia University Thesis/Project Title: VANET, Intelligent transportation Systems Present Position: Software engineer, Amazon
2017/9 - 2022/4 Principal Supervisor	Ali Sayed (Completed) , concordia University Thesis/Project Title: Edge computing, RIS Present Position: Principal Engineer, TATA- NJ
2017/9 - 2021/8 Principal Supervisor	Ibrahim Sorkhoh (Completed) , Concordia University Thesis/Project Title: 5G networks, Vehicular cloud networks, edge computing Present Position: PDF, McGILL + Ericsson
2017/5 - 2021/5 Principal Supervisor	Ekram Kabeer (Completed) , Concordia University Thesis/Project Title: Electric Vehicles, Scheduling, Machine Learning Present Position: Postdoc, Ericsson
2017/1 - 2020/8 Principal Supervisor	Elie Haber (Completed) , Concordia University Thesis/Project Title: Clouds, Mobile Edge Computing, Offloading, Cellular Present Position: PDF, Dalhousie University
2016/8 - 2021/2 Principal Supervisor	Sadegh Torabi (Completed) , Concordia University Thesis/Project Title: Security, Internet Of Things, Darknet data analysis Present Position: Assistant Prof., George Mason University
2016/1 - 2019/8 Principal Supervisor	Mohaned Chraiti (Completed) , Concordia University Thesis/Project Title: Physical Layer Security, wireless communications, NOMA access Present Position: Assistant Professor, Turkey - sabanci univ
2015/5 - 2018/10 Co-Supervisor	Tri Nguyen (Completed) , Ecole de Technology Superieur, ETS Thesis/Project Title: 5G, wireless backhaul, green networks, energy efficiency. Present Position: Senior Engineer, Canada Railway

2015/1 - 2018/10 Principal Supervisor	Hyame Alameddine (Completed) , Concordia University Thesis/Project Title: Network Function Virtualization, Bandwidth Guarantees, SDN, Data Centers. Present Position: Principal Engineer, Ericsson Montreal
2014/1 - 2018/10 Principal Supervisor	Bassam Moussa (Completed) , Concordia University Thesis/Project Title: Security in Smart grids. Present Position: Principal Engineer, Hydro Quebec
2013/9 - 2018/10 Principal Supervisor	Reem Kateb (Completed) , Concordia University Thesis/Project Title: survivable virtual network embedding Present Position: Assistant Professor, Saudi Arabia

Post-doctorate [n=2]

2017/9 - 2019/8 Co-Supervisor	Dariush Ebrahimi (Completed) , Waterloo Thesis/Project Title: Data collection, UAVs, IoT. Present Position: Assistant Professor, Laurier University
2015/5 - 2017/4 Principal Supervisor	Elmahdi Driouch (Completed) , Concordia University Thesis/Project Title: Power control in heterogeneous cellular networks Present Position: Assistant Professor, Université de Moncton

Event Administration

2024/4 - 2024/4	General Chair, IEEE DRCN 2024, Conference, 2024/4 - 2024/4
2021/5 - 2021/5	Program Chair, IEEE ICC 2021 - Optical Networks Symposium, Conference, 2021/5 - 2021/5
2018/6 - 2018/6	Technical Program Chair, IEEE Conference on Network Softwarization, Conference, 2018/6 - 2018/6
2017/12 - 2017/12	Technical Program Chair, IEEE Globecom 2017, Mobile and Wireless Networks Symposium, Conference, 2017/12 - 2017/12
2017/6 - 2017/6	Technical Program Chair, IEEE Cloudnet 2017, Conference, 2017/6 - 2017/6

Editorial Activities

2012/5 - 2025/5	Associate Editor, IEEE Transactions on Vehicular Technologies, Journal
2017/4 - 2025/4	Associate Editor, IEEE Transactions on Mobile Computing, Journal
2006/3 - 2025/3	Associate Editor, IEEE Communications Surveys and Tutorials, Journal
2013/1 - 2025/1	Associate Editor, IEEE Transactions on communications, Journal
2018/9 - 2022/8	Associate Editor, IEEE Transactions on Networks and Service Management, Journal
2009/9 - 2018/5	Associate Editor, Computer Networks, ELSEVIER, Journal

Organizational Review Activities

2014/1 - 2021/7	Reviewer, king fahd university of petroleum and minerals Frequent review of research proposals for their research office. On average I review 1-2 proposals per year.
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2014/1 - 2021/7	Reviewer, NSERC Reviewer for NSERC research proposals (Discovery Grant Program).
2014/1 - 2021/1	Reviewer, Kuwait University Expert review of research proposals for their research office.

Committee Memberships

2018/9	Committee Member, Faculty Research Committee, Concordia University
2018/5	Committee Member, Faculty Promotion and Tenure Committee, Concordia University
2018/3	Co-chair, IEEE WCNC, IEEE
2015/5	Committee Member, Graduate Price Committee, Concordia University, ENCS, Concordia University The committee meets and review applications for awards allocated to new students as well as existing students.
2015/5	Committee Member, Faculty Research Committee, Faculty of engineering and computer science., Concordia University This committee evaluated applications from faculty members for internal awards as well as university research chairs, midterm reviews, etc.
2015/5	Committee Member, Department Tenure Committee, Concordia University Review and recommend tenure for faculty members in the CIISE department.
2014/5	Committee Member, Graduate Curriculum Committee and Council of the School of Graduate Studies, Concordia University Evaluation of new curriculum, courses proposals, research related issues, graduate student supervision, etc.
2012/9	Committee Member, COOP institute, Concordia University, Concordia University
2012/5	Committee Member, IEEE Globecom, IEEE ICC, IEEE WCNC, IEEE VTC, IEEE Cloudnet, IEEE Netsoft, IEEE WIMOB, and various IEEE Conferences, IEEE
2021/1 - 2021/12	Co-chair, IEEE International Conference on Communications (ICC), IEEE
2018/5 - 2021/5	Committee Member, Graduate Studies Curriculum Committee, Concordia University

Other Memberships

2020/10	IEEE Fellow, IEEE
2015/9	Professional Engineer, Professional Engineering Ontario

Presentations

- (2023). Safeguarding the EV Ecosystem. Seminar series at Khalifa University, Abu Dhabi, United Arab Emirates
Main Audience: Researcher
Invited?: Yes, Keynote?: No

2. (2023). Safeguarding the EV Ecosystem: reliable and secure ecosystem for the charging needs of EVs and achieving a sustainable transportation sector. The 14th IEEE International Conference on Power Electronics and Drive Systems <https://ieee-peds.org>, Montreal, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
3. (2023). Ensuring a Resilient and Secure EV Charging Infrastructure for Sustainable Transportation. The 8th International Conference on Information and Communication Technologies for Disaster Management (ICT-DM), Cosenza, Italy
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
4. (2021). Non-Orthogonal Multiple Access for Massive Connectivity in Future Cellular Networks. The 10th IFIP/IEEE International Conference on Performance Evaluation and Modeling in Wired and Wireless Networks, Waterloo, Canada
Invited?: Yes, Keynote?: Yes
5. (2021). Non-Orthogonal Multiple Access for Massive Connectivity in Future Cellular Networks. IEEE Latin-American Conference on Communications (LATINCOM), Santo Domingo, Dominican Republic
Invited?: Yes, Keynote?: Yes
6. (2020). Opportunities, Challenges and Layered Architecture of VLC Systems: Towards a Practical Design for LiFi Networks. IEEE International conference on Wireless Communications & Mobile Computing, ICWCMC, Limassol, Cyprus
Invited?: Yes, Keynote?: Yes
7. (2019). (Reliable) Service Chaining in Softwarized Networks. Invited Seminar at Huawei Montreal, Montreal, Canada
Invited?: Yes, Keynote?: No
8. (2019). Edge Computing Empowering IoT-Services for Smart Cities. IEEE ACTEA, Beirut, Lebanon
Invited?: Yes, Keynote?: Yes
9. (2018). Unmanned Aerial Vehicles: Applications, Research Challenges and Future Directions. Invited seminar at University of CAUCA, Popayan, Colombia
Main Audience: General Public
Invited?: Yes, Keynote?: Yes
10. (2018). Multi Access Edge Computing. Seminar series, Popayan, Colombia
Invited?: Yes, Keynote?: No
11. (2018). Trends and Issues in Network Softwarization. Seminar series, Popayan, Colombia
Invited?: Yes, Keynote?: No
12. (2018). Internet of Things and Smart cities. Invited seminar at University of Paris, Est., Paris, France
Main Audience: Researcher
Invited?: Yes, Keynote?: No

Broadcast Interviews

- | | |
|----------------------------|--|
| 2023/09/27 -
2023/09/27 | Cybersecurity in EVs and modern vehicles, discussing risks and challenges with EVs in terms of privacy and cybersecurity, and how consumers could be more responsible., The Canadian Press, The Canadian Press |
| 2022/11/04 -
2022/11/04 | EV Charging Ecosystem cybersecurity, Radio Canada, Radio Canada |
| 2022/04/04 -
2022/04/04 | Des failles de cybersécurité dans les bornes de recharge de véhicules électriques, Société, Le Devoir |

Publications

Journal Articles

1. Nathalie Wehbeh, Hyame Alameddine, Makan Pourzandi, Elias Bou-Harb, Chadi Assi. (2023). A Security Assessment of HTTP/2 Usage in 5G Service Based Architecture. IEEE communications magazine. Published
Refereed?: Yes
2. Ahmad Al-Hilo, Moataz Shokry, Mohamad El Hattab, Chadi Assi, Sanaa Sharafeddine. (2023). RIS-Assisted UAV for Timely Data Collection in IoT Networks. IEEE Systems Journal. Published
Refereed?: Yes, Open Access?: No
3. Khaled Sarieeddine, Mohammad Ali Sayed, Sadegh Torabi, Ribal Atallah, and Chadi Assi. (2023). Edge-Based Detection and Localization of Adversarial Oscillatory Load Attacks Orchestrated By Compromised EV Charging Stations. International Journal of Electrical Power and Energy Systems. Accepted
Refereed?: Yes, Open Access?: No
4. Khaled Sarieeddine, Mohamad Sayed, Danial Jafarigiv, Ribal Atallah, Mourad Debbabi, Chadi Assi. (2023). A Real-Time Cosimulation Testbed for Electric Vehicle Charging and Smart Grid Security. IEEE Security & Privacy. Accepted
Refereed?: Yes, Open Access?: No
5. W Lyu, Y Xiu, Y Zhao, C Assi, Z Zhang. (2023). Age Minimization in Outdoor and Indoor Communications with Relay-aided Dual RIS. IEEE Communications Letters. Accepted
Refereed?: Yes, Open Access?: No
6. Shreya Khisa, Mohamad El Hattab, Chadi Assi, Sanaa Sharafeddine. (2023). Energy Consumption Optimization in RIS-Assisted Cooperative RSMA Cellular Networks. IEEE Transactions on Communications. Accepted
Refereed?: Yes, Open Access?: No
7. Ali Syed Muhammad, Mohamad El Hattabv, Mohamad Amine Arfaoui, Chadi Assi. (2023). Optimizing Information Freshness in RIS-assisted Non-Orthogonal Multiple Access-based IoT Networks. IEEE Networking Letters. Accepted
Refereed?: Yes, Open Access?: No
8. Salwa Razaulla, Claude Fachkha, Christine Markarian, Amjad Gawanmeh, Wathiq Mansoor, Benjamin CM Fung, Chadi Assi. (2023). The Age of Ransomware: A Survey on the Evolution, Taxonomy, and Research Directions. IEEE Access. Accepted
Refereed?: Yes, Open Access?: Yes
9. Khaled Sarieeddine, Mohammad Ali Sayed, Sadegh Torabi, Ribal Atallah, and Chadi Assi. (2023). Investigating the Security of EV Charging Mobile Applications As an Attack Surface. ACM Transactions on Cyber-Physical Systems. Accepted
Refereed?: Yes, Open Access?: No

10. Mohamad Almekhlafi, Mohamad Amine Arfaoui, Chadi Assi, Ali Ghrayeb. (2023). A Low Complexity Passive Beamforming Design for Reconfigurable Intelligent Surface (RIS) in 6G Networks. IEEE Transactions on Vehicular Technology.
Accepted
Refereed?: Yes, Open Access?: No
11. A. Al Hilo, M. Shorky, M. El Hattab, C. Assi, S. Sharafeddine,. (2022). Reconfigurable Intelligent Surface Enabled Vehicular Communication: Joint User Scheduling and Passive Beamforming. IEEE Transactions on Vehicular Technology.
Published
Refereed?: Yes, Open Access?: No
12. Ahmadreza Abazari Mohsen Ghafouri, Masoud Zasdard, Ribal Atallah and Chadi Assi. (2022). A Data Mining/ANFIS and Adaptive Control for Detection and Mitigation of Attacks on DC MGs. IEEE Transactions on Smart Grids.
Accepted
Refereed?: Yes
13. Mohamad El Hattab, M Amine Arfaoui, Chadi Assi, Ali Ghrayeb. (2022). RIS-Assisted Joint Transmission in a Two-Cell Downlink NOMA Cellular System. IEEE Journal on Selected Areas in Communications, JSAC.
Published
Refereed?: Yes, Open Access?: No
14. Shreya Khisa, Mohamad Hamood, Mohamad El Hattab, Chadi Assi. (2022). Full Duplex Cooperative Rate Splitting Multiple Access for a MISO Broadcast Channel with two Users. IEEE Communications Letters.
Published
Refereed?: Yes
15. MA Sayed, R Atallah, C Assi, M Debbabi. (2022). Electric vehicle attack impact on power grid operation. International Journal of Electrical Power & Energy Systems.
Published
Refereed?: Yes, Open Access?: No
16. Mohamad El-Hattab, Amine Arfaoui, Chadi Assi, Ali Ghrayeb, Marwa Qarake. (2022). On Optimizing the Power Allocation and Decoding Order in UL C-NOMA. IEEE Communications Letters.
Accepted
Refereed?: Yes
17. Shirin Rezasoltani; Leszek Szczecinski; Chadi Assi. (2022). Semantic Metrics for Non Real-Time Applications. IEEE Transactions on Communications.
Published
Refereed?: Yes, Open Access?: No
18. MA Arfaoui, A Ghrayeb, C Assi, M Qarake. (2022). CoMP-Assisted NOMA and Cooperative NOMA in Indoor VLC Cellular Systems. IEEE Transactions on Communications.
Published
Refereed?: Yes, Open Access?: No
19. M Almekhlafi, MA Arfaoui, C Assi, A Ghrayeb. (2022). Superposition-Based URLLC Traffic Scheduling in 5G and Beyond Wireless Networks. IEEE Transactions on Communications.,
Published
Refereed?: Yes, Open Access?: No
20. T Nasr, S Torabi, E Bou-Harb, C Fachkha, C Assi. (2022). Power jacking your station: In-depth security analysis of electric vehicle charging station management systems. Computers & Security.
Published
Refereed?: Yes, Open Access?: No

21. Elie Haber, Hyame Alameddine, Sanaa Sharafeddine, Chadi Assi. (2021). UAV-aided Ultra-Reliable Low-Latency Computation Offloading in Future IoT Networks. IEEE Transactions on Communications.
Accepted
Refereed?: Yes
22. Muhammad, Ali; Sorkhoh, Ibrahim; Shoukry, Moataz; Ebrahimi , Dariush ; Assi, Chadi. (2021). Minimizing Age of Information in Multi-Access Edge Computing-assisted IoT Networks. IEEE IoT Journal.
Published
Refereed?: Yes, Open Access?: No
23. Maurice Khabbaz, Chadi Assi, Sanaa Sharafeddine. (2021). Multi-Hop V2U Path Availability Analysis in UAV-Assisted Vehicular Networks. IEEE Internet of Things Journal. Volume: 8(Issue: 13)
Published
Refereed?: Yes
24. M. Kadry, A. Arfaoui, C. Assi, A. Ghrayeb,. (2021). Reconfigurable Intelligent Surface Assisted Coordinated Multipoint in Downlink NOMA Networks. IEEE Communications Letters.
Published
Refereed?: Yes
25. Moataz Shokry, Mohamed Kadry, Chadi Assi, Sanaa Sharafeddine, Ali Ghrayeb. (2021). Optimizing Age of Information Through Aerial Reconfigurable Intelligent Surfaces: A Deep Reinforcement Learning Approach. IEEE Transactions on Vehicular Technology.
Published
Refereed?: Yes
26. Ahmad Al-Hilo, Dariush Ebrahimi, Sanaa Sharafeddine, Chadi Assi. (2021). Vehicle-Assisted RSU Caching Using Deep Reinforcement Learning. IEEE Transactions on Emerging Topics in Computing.
Published
Refereed?: Yes
27. M Almekhlafi, MA Arfaoui, M Elhattab, C Assi, A Ghrayeb. (2021). Joint Resource Allocation and Phase Shift Optimization for RIS-Aided eMBB/URLLC Traffic Multiplexing. IEEE Transactions on Communications.
Published
Refereed?: Yes
28. Shirin Rezasoltani, Chadi Assi. (2021). Real Time Status Updates in Wireless HARQ with Imperfect Feedback Channel. IEEE Transactions on Wireless Communications.
Published
Refereed?: Yes, Open Access?: No
29. Mohammad Hamood, Mohaned Chraiti, Amine Arfaoui, Chadi Assi, Ali Ghrayeb, Amira Alloum. (2021). A Downlink Puncturing Scheme for Simultaneous Transmission of URLLC and eMBB Traffic by Exploiting Data Similarity. IEEE Transactions on Vehicular Technology.
Published
Refereed?: Yes, Open Access?: No
30. M Ghafouri, U Karaagac, A Ameli, J Yan, C Assi. (2021). A Cyber Attack Mitigation Scheme for Series Compensated DFIG-Based Wind Parks. IEEE Transactions on Smart Grid.
Published
Refereed?: Yes, Open Access?: No
31. Ahmed Mahdi, Dariush Ebrahimi, Sanaa Sharafeddine, Chadi Assi. (2021). A Cooperative Approach for Content Caching and Delivery in UAV-Assisted Vehicular Networks. Vehicular Communications, Elsevier.
Published
Refereed?: Yes, Open Access?: No

32. Ibrahim Sorkhoh, Chadi Assi, Dariush Ebrahimi, Sanaa Sharafeddine. (2021). Optimizing Information Freshness for MEC-enabled Cooperative Autonomous Driving. IEEE Transactions on Intelligent Transportation.
Published
Refereed?: Yes
33. ME Kabir, M Ghafouri, B Moussa, C Assi. (2021). A Two-Stage Protection Method for Detection and Mitigation of Coordinated EVSE Switching Attacks. IEEE Transactions on Smart Grid.
Published
Refereed?: Yes, Open Access?: No
34. M. Amine Arfaoui, Mohammad Dehghani Soltani, Iman Tavakkolnia, Ali Ghrayeb, Chadi Assi, Majid Safari, and Harald Haas. (2021). Invoking Deep Learning for Joint Estimation of Indoor LiFi User Position and Orientation. IEEE Journal of Selected Areas on Communications, Accepted 2021.
Published
Refereed?: Yes, Open Access?: No
35. Mirabelle Dib, Ssadeq Torabi, Elias Bou-Harb, Chadi Assi. (2021). A multi-dimensional deep learning framework for IoT malware classification and family attribution. IEEE Transactions on Network and Service Management.
Published
Refereed?: Yes, Open Access?: No
36. S Torabi, M Dib, E Bou-Harb, C Assi, M Debbabi. (2021). A Strings-Based Similarity Analysis Approach for Characterizing IoT Malware and Inferring Their Underlying Relationships. IEEE Networking Letters.
Published
Refereed?: Yes, Open Access?: No
37. Elie Haber, Mohamad Kadry, Sanaa Sharafeddine, Chadi Assi. (2021). Latency and Reliability Aware Edge Computation Offloading via an Intelligent Reflecting Surface. IEEE Communications Letters.
Accepted
Refereed?: Yes
38. S Torabi, M Dib, E Bou-Harb, C Assi, M Debbabi. (2021). A Strings-Based Similarity Analysis Approach for Characterizing IoT Malware and Inferring Their Underlying Relationships. IEEE Networking Letters.
Published
Refereed?: Yes
39. M. Kadry, A. Arfaoui, C. Assi. (2021). Power Allocation in CoMP-empowered C-NOMA Networks. IEEE Networking Letters.
Published
Refereed?: Yes
40. Ali Muhammad, Ibrahim Sorkhoh, Long Qu, and Chadi Assi. (2021). Delay-Sensitive Multi-Source Multicast Resource Optimization in NFV-Enabled Networks: A Column Generation Approach. IEEE Transactions on Network and Service Management.
Published
Refereed?: Yes
41. Ekram Kabeer, Ibrahim Sorkhoh, Bassam Moussa, Chadi Assi. (2021). Joint Routing and Scheduling of Mobile Charging Infrastructure for V2V Energy Transfer. IEEE Transactions on Intelligent Vehicles.
Published
Refereed?: Yes
42. Joseph Antoun, Ekram Kabir, Ribal Atallah, Chadi Assi. (2021). A Data Driven Performance Analysis Approach for Enhancing the QoS of Public Charging Stations. IEEE Transactions on Intelligent Transportation Systems.
Published
Refereed?: Yes, Open Access?: No

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1. Massimo Tornatore, Teresa Gomes, Carmen Mas-Machuca, Domique Schupke, Eiji Oki, and Chadi Assi. (2023). Special Issue on Design and Management of Reliable Communication Networks. IEEE Transactions on Networks and Service Management.
In Press
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1. A Amhaz, S Khisa, M El Hattab, C Assi, S Sharafeddine. (2023). Full Duplex UAV-Assisted Rate-Splitting Multiple Access Cellular Networks. IEEE Global Communications Conference, kuala lumpur, Malaysia
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2. A Amhaz, M El Hattab, C Assi, S Sharafeddine. (2023). Integrated Sensing and Communication: NOMA vs Cooperative NOMA. IEEE Global Communications Conference, Kawala Lumpur, Malaysia
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Paper
Published
Refereed?: Yes, Invited?: No
42. Reem Kateb, Parisa Akaber, Mosaddek Hossain Kamal Tushar, Mourad Debbabi, Chadi Assi. (2017). Delay aware measurements gathering in WAMS communication network. IEEE GlobalSIP, Montreal, Canada
Paper
Published
Refereed?: Yes, Invited?: No
43. Mohamed-Amine Arfaoui, Ali Ghrayeb, Chadi Assi. (2017). On the achievable secrecy rate of the MIMO VLC Gaussian wiretap channel. Personal, Indoor and Mobile Radio Communications (PIMRC), IEEE, Montreal, Canada
Paper
Published
Refereed?: Yes, Invited?: No
44. Tri Minh Nguyen, Wessam Ajib, Chadi Assi. (2017). Online Algorithm for Wireless Backhaul HetNets with Advanced Small Cell Buffering. The 26th International Conference on Computer Communications and Networks (ICCCN 2017), Vancouver, Canada
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Disclosures

1. Vulnerabilities found on backend systems of a major EV charging operator
Disclosed
Major design flaws found on the management system of a major EV charging network operator.
Vulnerabilities discovered and reported to the operator. The operator acknowledged and preparing fixes.

2. Common Vulnerabilities on EV charging product; vendor - Schneider

Disclosed

Cyber threat vulnerabilities found on EVLink products, vulnerabilities reported to vendor and acknowledged. See the below report: Schneider Electric Patches 7 Bugs in EVlink Products <https://www.bankinfosecurity.com/schneider-electric-patches-7-bugs-in-evlink-products-a-18215>



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Dr. Anjali Awasthi

Correspondence language: English

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The primary information is denoted by (*)

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This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Protected when completed

Dr. Anjali Awasthi

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes
Hindi	Yes	Yes	Yes	Yes	Yes

Degrees

- 2004/11 Doctorate, Automation, Université de Metz
Supervisors: Dr. Jean-Marie Proth, Dr. Alexandre Dolgui, 2002/2 - 2004/12
- 2000/5 Master's Thesis, Industrial and Management Engineering, Indian Institute of Technology Kanpur
Supervisors: Dr. Rahul Varman, 1998/5 - 2000/5

Recognitions

- 2019/1 Best Paper Award
International Journal of Modeling and Simulation
Prize / Award
A system dynamics based simulation model to evaluate regulatory policies for sustainable transportation planning" by Sayyadi R., and Awasthi A.
- 2018/6 Eldon Gunn Service Award - 0
Canadian Operational Research Society (CORS)
Prize / Award
The Eldon Gunn Service Award is presented to members of the society who have made outstanding contributions of time and service to the society, at the national or local level, as conference organizers or as editors of CORS publications.
- 2017/4 - 2021/4 Education Chair
Canadian Operations Research Society (CORS)
Honor
Education Chair

User Profile

Research Specialization Keywords: City Logistics, Data mining, IT and Decision making, Modelling and Simulation, Quality Management, Sustainable Supply Chains

Employment

2019/5	Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Professor Tenure Status: Tenure
2013/8 - 2019/8	Associate Professor CIISE, Engineering and Computer Sciences, Concordia University Full-time, Associate Professor Tenure Status: Tenure
2008/8 - 2013/7	Assistant Professor Engineering and Computer Science, Concordia University Full-time, Assistant Professor Tenure Status: Tenure Track
2007/1 - 2008/7	Project Advisor Sauder School of Business, University of British Columbia Full-time Tenure Status: Non Tenure Track
2006/8 - 2006/12	Postdoc Researcher Génie mécanique, Université Laval Full-time Tenure Status: Non Tenure Track
2005/2 - 2006/7	Research Engineer Logistique et Organisation Industrielles, EIGSI La Rochelle
2000/6 - 2001/12	Software Engineer Software Development, Tata Consultancy Services

Research Funding History

Awarded [n=8]

2022/4 - 2028/3 Principal Investigator	Autonomous goods distribution planning under complex urban environments, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 155,000 Portion of Funding Received - 100 Funding Competitive?: Yes
2019/1 - 2027/3 Co-investigator	Advanced Manufacturing Automation, Digitization and Optimization - AMADO, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 999,999 Portion of Funding Received - 10 Funding Competitive?: Yes
2018/3 - 2023/3 Co-applicant	A digital technology platform for supply chain, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) CRD

Total Funding - 885,000
 Portion of Funding Received - 20
 Funding Competitive?: Yes

2019/1 - 2022/1
 Co-investigator

Human errors analysis in an aircraft engine assembly center, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate

Total Funding - 60,000
 Portion of Funding Received - 50
 Funding Competitive?: Yes

2015/5 - 2020/4
 Principal Applicant

Sustainable city logistics planning under collaboration, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
 Discovery Grant

Total Funding - 110,000
 Portion of Funding Received - 100
 Funding Competitive?: Yes

2019/9 - 2020/2
 Principal Applicant

Industrial Economics Research Based on Multi-tier Supply Chain in the Background of Industry 4.0, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Globalink Research Award

Total Funding - 5,000
 Portion of Funding Received - 100
 Funding Competitive?: Yes

2018/12 - 2019/6
 Co-applicant

Logistics optimization models for breast cancer patients, Grant

Funding Sources:

IVADO
 Total Funding - 25,000
 Portion of Funding Received - 50
 Funding Competitive?: Yes

2017/2 - 2017/8
 Principal Applicant

Investigating the impact of greening harbor trucking initiative on port sustainability performance, Grant

Funding Sources:

NSERC ENGAGE
 Total Funding - 25,000
 Portion of Funding Received - 100
 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=35]

2022/9 - 2024/12 Principal Supervisor	Nitish Suvarna (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Assessing Impact of Autonomous Vehicles on Supply Chain Performance – A Case Study of Agri-Food Supply Chain Present Position: MASc Student, Concordia University
2022/9 - 2024/12 Principal Supervisor	Manmeet Singh (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Incident Management for Autonomous Electric Vehicles Present Position: MASc Student, Concordia University
2022/9 - 2024/12 Principal Supervisor	Rubel Kar (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: User requirements planning for autonomous vehicles in urban areas Present Position: MASc Student, Concordia University
2022/8 - 2024/12 Principal Supervisor	Varshini Venkatesh (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Renewable energy planning for autonomous vehicles Present Position: MASc Student, Concordia University
2022/1 - 2024/12 Principal Supervisor	Samiul Bashir Shihab (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Autonomous vehicles and sustainable supply chain management Present Position: MASc Student, Concordia University
2022/1 - 2024/12 Principal Supervisor	Mina Nikdast (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Autonomous vehicles planning for urban freight transport Present Position: MASc Student, Concordia University
2021/1 - 2024/12 Principal Supervisor	Marziehsadat Arabi (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Simulation of charging management strategies for autonomous electric vehicles Present Position: MASc Student, Concordia University
2021/1 - 2024/7 Principal Supervisor	Murali Krishna Vakada (In Progress) , Concordia University Student Degree Expected Date: 2024/7 Thesis/Project Title: Evaluating Infrastructure Demand and Optimizing Charging Strategies for Battery Electric Bus Fleet- A Pilot Study on Concordia Shuttle Fleet Present Position: MASc Student
2019/9 - 2021/10 Principal Supervisor	Aishwary Nipane (Completed) , Concordia University Thesis/Project Title: Comprehending user inclinations towards autonomous vehicles Present Position: Programmer Analyst, Berry Global
2019/9 - 2021/9 Principal Supervisor	Amir Zohouri (Withdrawn) , Concordia University Thesis/Project Title: Large scale systems simulation for autonomous vehicles Present Position: Student
2019/9 - 2021/9 Principal Supervisor	Hiva Hosseini (Completed) , Concordia University Thesis/Project Title: Customer requirements modeling for smart cities Present Position: Student

2019/9 - 2021/9 Principal Supervisor	Ali Gamarooni (Completed) , Concordia University Thesis/Project Title: Standards development for airworthiness-related organizations Present Position: Student
2019/9 - 2021/9 Principal Supervisor	Faridoddin Moazzeni (Completed) , Concordia University Thesis/Project Title: Global supply chain quality management Present Position: Student
2019/8 - 2021/8 Principal Supervisor	Sarah Niazalizadeh Moghadam (Withdrawn) , Concordia University Thesis/Project Title: User requirements analysis for autonomous vehicles Present Position: Student
2019/4 - 2020/4 Principal Supervisor	Elena Golchin (Completed) , Concordia University Thesis/Project Title: Fleet management and energy management for self driving vehicles Present Position: Student
2019/4 - 2020/4 Principal Supervisor	Mehdi Azad (Completed) , Concordia University Thesis/Project Title: Market maturity assessment for autonomous vehicles Present Position: Student
2019/4 - 2021/4 Co-Supervisor	Payam Abbasi (Completed) , Concordia University Thesis/Project Title: Network requirements planning for Industrial Symbiosis Present Position: Student
2019/1 - 2021/1 Co-Supervisor	Ali Alirezaee (Completed) , Concordia University Thesis/Project Title: IoT enabled supply chain planning for cold produce Present Position: Student
2019/1 - 2020/12 Principal Supervisor	Asma Ramjean (Completed) , Concordia University Thesis/Project Title: Digital supply chain quality management Present Position: Student
2018/9 - 2020/9 Co-Supervisor	Seyedeh Negar Ghodsi (Completed) , Concordia University Thesis/Project Title: Facility location planning under disruption Present Position: Student
2018/9 - 2020/9 Principal Supervisor	Ujjwal Khanna (Completed) , Concordia University Thesis/Project Title: Multicriteria models for pedestrian safety planning Present Position: Student
2018/9 - 2020/9 Co-Supervisor	Mohd Safwan Ahmad Ansari (Completed) , Concordia University Thesis/Project Title: Deep learning based survival analysis Present Position: Student
2018/9 - 2020/8 Co-Supervisor	Akhil Raj Kizhakkan (Completed) , Concordia University Thesis/Project Title: Electric vehicle charging station location planning Present Position: Student
2018/1 - 2020/8 Principal Supervisor	Mohsen Amoie (Completed) , Concordia University Thesis/Project Title: Data mining approaches for traffic congestion prediction Present Position: Student
2017/9 - 2020/9 Principal Supervisor	Ehsan Sharif Nia (Completed) , Concordia University Thesis/Project Title: Logistics optimization for rural cancer patients Present Position: Student
2017/4 - 2019/4 Co-Supervisor	Suganya Jayapalan (Completed) , Concordia University Thesis/Project Title: Information Sharing for Improved Supply Chain Collaboration - Simulation Analysis Present Position: Project Manager

2017/4 - 2020/8 Principal Supervisor	Omar Lucas (Completed) , Concordia University Thesis/Project Title: Humanitarian Relief Supply Chains Present Position: Student
2016/8 - 2018/8 Principal Supervisor	Rupinder Kaur Bhullar (Completed) , Concordia University Thesis/Project Title: Enterprise, project and workforce selection for Industry 4.0 Present Position: Research Assistant
2016/8 - 2018/8 Principal Supervisor	Akolade Adegoke (Completed) , Concordia University Thesis/Project Title: Benchmarking sustainability performance of Ports Present Position: Management Consultant, Deloitte
2016/8 - 2018/8 Principal Supervisor	Navneet Kaur Bajwa (Completed) , Concordia University Thesis/Project Title: Modelling and simulation of blockchain in education based system Present Position: Research Assistant
2016/8 - 2017/11 Principal Supervisor	Vignesh Alageshan (Completed) , Concordia University Thesis/Project Title: Simulating the impact of Green Harbor Trucking initiative on Port of Montreal Present Position: Business Analyst
2015/5 - 2017/5 Principal Supervisor	Abbas Tavassoli (Completed) , Concordia University Thesis/Project Title: A Multicriteria Framework for Benchmarking Sustainability Performance of Organizations Present Position: Project Quality Engineer, Faiveley Vapor Rail, A Wabtec Company
2015/4 - 2017/5 Principal Supervisor	Mina Jafari (Completed) , Concordia University Thesis/Project Title: Assessing the Impact of Sustainable Practices on Organizational Performance Present Position: Industrial Engineer
2014/1 - 2017/4 Principal Supervisor	Rupinder Kaur (Completed) , Concordia University Thesis/Project Title: Bibliometric Analysis for the Field of City Logistics: Study of Procedia- Journal of Social and Behavioral Science, 2010-2016 Present Position: Project Manager
2014/1 - 2017/9 Principal Supervisor	Mohd Jawad Ur Rahman (Completed) , Concordia University Thesis/Project Title: Predicting road transport GHG emissions with application for Canada Present Position: Business Systems Analyst, TD Bank

Doctorate [n=19]

2023/9 - 2027/12 Principal Supervisor	Suresh Nagina (In Progress) , Concordia University Student Degree Expected Date: 2027/12 Thesis/Project Title: User requirements modeling for autonomous electric vehicles Present Position: PhD student, Concordia University
2023/9 - 2028/12 Principal Supervisor	Abdusami Abdurahman (In Progress) , Concordia University Thesis/Project Title: Fleet management strategies for autonomous electric vehicles Present Position: PhD student
2023/7 - 2028/12 Principal Supervisor	Basim Tareq M Alghabashi, Concordia University Thesis/Project Title: Data mining models for autonomous vehicle routing Present Position: PhD student

2022/1 - 2026/12 Co-Supervisor	Sarah Farahdel (In Progress) , Concordia University Student Degree Expected Date: 2027/12 Thesis/Project Title: A Comparative Analysis Between Sustainability Performance Measurement Models and Sustainability Assessment Tools for Higher Educational Institutes: A Critical Literature Review Present Position: PhD student, Concordia University
2021/9 - 2028/12 Co-Supervisor	Rupinder Kaur, Concordia University Thesis/Project Title: Environment based design models for project team planning Present Position: PhD student
2021/1 - 2027/12 Principal Supervisor	Behrouz Samieyan (In Progress) , Concordia University Student Degree Expected Date: 2027/12 Thesis/Project Title: Simulating autonomous vehicles for last mile delivery Present Position: PhD student, Concordia University
2019/1 - 2022/12 Co-Supervisor	Ali Roozbeh Nia (Completed) , Concordia University Thesis/Project Title: Collaborative inventory planning and forecasting Present Position: Student
2019/1 - 2022/12 Principal Supervisor	Chinedu Egbuonu (Withdrawn) , Concordia University Thesis/Project Title: Track and trace technologies for port logistics Present Position: Student
2018/5 - 2024/12 Principal Supervisor	Osama Alshareet (In Progress) , Concordia University Student Degree Expected Date: 2027/12 Thesis/Project Title: Artificial Intelligence-Powered Recommender Solutions for E-commerce: A Novel Multi-Dimensional Evaluation and Innovation Approach Present Position: PhD student, Concordia University
2018/1 - 2023/12 Principal Supervisor	Samia Hilal (Withdrawn) , Concordia University Thesis/Project Title: Integration platform for buyer supplier collaboration Present Position: PhD Student
2017/8 - 2024/12 Principal Supervisor	Khasawneh Mohammad (In Progress) , Concordia University Thesis/Project Title: Metaheuristics for Smart Traffic Management Systems Present Position: PhD Student
2015/1 - 2020/12 Principal Supervisor	Behnam Izadi (In Progress) , Concordia University Thesis/Project Title: Autonomous carsharing systems Present Position: PhD Student
2013/9 - 2020/12 Co-Supervisor	Matin Giahi Foomani (Completed) , Concordia University Thesis/Project Title: Intelligent Transportation Systems Present Position: PhD Student
2013/9 - 2020/12 Co-Supervisor	Hassan Mukhtar (Withdrawn) , Concordia University Thesis/Project Title: Supplier quality management in global supply chains Present Position: PhD Student
2013/9 - 2020/9 Principal Supervisor	Ali Khabbazian (In Progress) , Concordia University Thesis/Project Title: Supplier selection under disruption Present Position: Student
2013/5 - 2017/12 Principal Supervisor	Hassan Algarni (Completed) , Concordia University Thesis/Project Title: Optimal design and analysis of solar PV systems Present Position: Faculty Member, Jubail Industrial College, Saudi Arabia
2013/4 - 2017/12 Principal Supervisor	Taiwo Adetiloye (Completed) , Concordia University Thesis/Project Title: Predicting short term traffic congestion on urban motorway networks Present Position: Data Scientist, Christus Health, USA

2012/9 - 2017/2	Aqeel Asaad Al Salem (Completed) , Concordia University
Principal Supervisor	Thesis/Project Title: Managing Consistency and Consensus in Group Decision Making with Incomplete Fuzzy Preference Relations Present Position: Faculty Member, Northern Border University, Saudi Arabia
2012/5 - 2020/12	Afify Badr (Completed) , Concordia University
Principal Supervisor	Thesis/Project Title: Supply chain planning under disruption Present Position: Student

Presentations

1. Murali K Vakada, Anjali Awasthi. (2023). Evaluating charging infrastructure demand and performance parameters for a university electric bus fleet. ORSI 2023, Bangalore, India
Invited?: No, Keynote?: No
2. Khosrow Noshad, Anjali Awasthi, Mahesh Sharma. (2023). Critical criteria for supplier quality development. SOM 2023, Shillong, India
Invited?: No, Keynote?: No
3. Pradeep Mishra, Anjali Awasthi. (2023). Green Hydrogen Supply Chain Ecosystem in India - Cost, Technology & Policy Perspective. SOM 2023, Shillong, India
Invited?: No, Keynote?: No
4. (2020). Industry 4.0 and Digital Supply Chain Management. Online webinar on "Industry 4.0" for Women counseling Cell, IPS College of Technology and Management, Gwalior, July 10, 2020 at 02:00pm IST., Gwalior, India
Main Audience: Researcher
Invited?: Yes, Keynote?: No
5. (2020). Research opportunities in Digitization and Sustainable Supply Chain Management. Lessons in Research Excellence' lecture series, 20 July 2020, at 2.00 PM (IST) organized by Doon University, Mothrowala Road, PO Ajabpur, Dehradun, Uttarakhand, India
Main Audience: Researcher
Invited?: Yes, Keynote?: No
6. Awasthi A. (2019). Sustainable City Logistics Planning : A multicriteria perspective. CORS 2019, Saskatoon, Canada
Invited?: No, Keynote?: No
7. Seyedehnegar Ghodsi, Farnoosh Naderkhani, Anjali Awasthi. (2019). Application of Markov Decision Process in Facility Location under Disruption. CORS 2019, Saskatoon, Canada
Invited?: No, Keynote?: No
8. Mohsen Amoei, Anjali Awasthi. (2019). Traffic detection and prediction with CNNs and regression analysis. CORS 2019, Saskatoon, Canada
Invited?: No, Keynote?: No
9. Mohd Safwan Ahmad Ansari, Farnoosh Naderkhani, Anjali Awasthi. (2019). Deep learning based survival analysis. CORS 2019, Saskatoon, Canada
Invited?: No, Keynote?: No
10. Izadi-Najafabadi B., Awasthi A. (2018). Preliminary study on autonomous vehicle fleet size for carsharing under demand uncertainty. Optimization Days, Montreal, Canada
Invited?: No, Keynote?: No
11. Saleh F., Awasthi A. (2018). Multi-tier supplier selection using total cost of ownership and data envelopment analysis. CORS 2018, Halifax, Canada
Invited?: No, Keynote?: No

12. Kaur R., Awasthi A. (2018). Cross-disciplinary workforce planning for Industry 4.0. Optimization Days, Montreal, Canada
Invited?: No, Keynote?: No
13. Adegoke A., Awasthi A. (2018). Benchmarking port sustainability performance using Data Envelopment Analysis. Optimization Days, Montreal, Canada
Invited?: No, Keynote?: No

Text Interviews

2024/02/07	Canadian cities embrace AI in the face of unprecedented gridlock, The globe and mail
2019/07/16	Pont Samuel-De Champlain : six voies a suivre pour une mobilite durable, La Conversation
2019/07/16	Les clés du succès du pont Samuel-De Champlain, Le Devoir
2019/06/25	Pont Samuel-De Champlain: un modèle pour l'avenir, dit un expert, Metro
2019/06/22	#MyCanada2067 : Vision of the future, Concordia Magazine
2019/04/02	Tackling traffic congestion, Concordia Magazine
2019/04/02	Optimiser le réseau de transport avant de l'élargir, Le devoir
2019/02/12	Connected vehicles panel, Globe Drive Mobility 2019
2019/02/12	Today's data-collection fuels the automated urban transport of tomorrow, The Globe and Mail
2019/02/06	The future is the city, Concordia Magazine
2018/12/04	A new study proposes smarter ways for cities to approach mass transit issues, Concordia Magazine
2018/09/24	Sustainable supply chain: How can we balance commercial need with mobility ?, Concordia Magazine

Publications

Journal Articles

1. Hassan Algarni, Arunachalam Sundaram, Anjali Awasthi, Rahul Chandel, Salwan Tajjour, Shyam Singh Chandel. (2024). A Comprehensive Review of Most Competitive Maximum Power Point Tracking Techniques for Enhanced Solar Photovoltaic Power Generation. Journal of Renewable Energy and Environment.
In Press
Refereed?: Yes, Open Access?: No
2. Ganji, S. S., Najafi, M., Mora-Cruz, A., Awasthi, A., & Ajirlu, S. F. (2023). Assessment of airline industry using a new double-frontier cross-efficiency method based on prospect theory. Annals of Operations Research. : 1-61.
Published
Refereed?: Yes, Open Access?: No
3. Nia, A. R., Awasthi, A., & Bhuiyan, N. (2023). Integrate exergy costs and carbon reduction policy in order to optimize the sustainability development of coal supply chains in uncertain conditions. International Journal of Production Economics. 257(108772)
Published
Refereed?: Yes, Open Access?: No

4. Alshareet, O., & Awasthi, A. (2023). Enhancing e-commerce recommendations with a novel scale-aware spectral graph wavelets framework. *International Journal of Data Science and Analytics.* : 1-14.
Published
Refereed?: Yes, Open Access?: Yes
5. Khasawneh, M. A., & Awasthi, A. (2023). Intelligent Meta-Heuristic-Based Optimization of Traffic Light Timing Using Artificial Intelligence Techniques. *Electronics.* 12(24): 49-68.
Published
Refereed?: Yes, Open Access?: Yes
6. Roozbeh Nia, A., Awasthi, A., & Bhuiyan, N. (2023). Assessment of coal supply chain under carbon trade policy by extended exergy accounting method. *Flexible Services and Manufacturing Journal.* : 1-69.
Published
Refereed?: Yes, Open Access?: No
7. Khasawneh, M. A., & Awasthi, A. (2023). Intelligent Meta-Heuristic-Based Optimization of Traffic Light Timing Using Artificial Intelligence Techniques. *Electronics.* 12(24): 49-68.
Published
Refereed?: Yes, Open Access?: Yes
8. Narwane, V. S., Raut, R. D., Gardas, B. B., Narkhede, B. E., & Awasthi, A. (2022). Examining smart manufacturing challenges in the context of micro, small and medium enterprises. *International Journal of Computer Integrated Manufacturing.* 35(12): 1395-1412.
Published
Refereed?: Yes, Open Access?: No
9. Afify, B., Soeanu, A., & Awasthi, A. (2021). Separation linearization approach for the capacitated facility location problem under disruption. *Expert Systems with Applications.* 169: 114-187.
Published
Refereed?: Yes, Open Access?: No
10. Al Salem, A. A., & Awasthi, A. (2021). Two new methods for decision-making with incomplete reciprocal fuzzy preference relations based on additive consistency. *International Journal of Modelling and Simulation.* 41(1): 24-38.
Published
Refereed?: Yes, Open Access?: No
11. Al Salem, A. A., & Awasthi, A. (2021). New consensus measure for group decision-making based on Spearman's correlation coefficient for reciprocal fuzzy preference relations. *International Journal of Modelling and Simulation.* 41(3): 163-175.
Published
Refereed?: Yes, Open Access?: No
12. Nia, A. R., Awasthi, A., & Bhuiyan, N. (2021). Industry 4.0 and demand forecasting of the energy supply chain: A literature review. *Computers & Industrial Engineering.* 154: 107-128.
Published
Refereed?: Yes, Open Access?: No
13. Kumar, L., Hossain, N. U. I., Fazio, S. A., Awasthi, A., Jaradat, R., & Babski-Reeves, K. (2021). A data driven decision model for assessing the enablers of quality dimensions: Context of industry 4.0. *CIRP Journal of Manufacturing Science and Technology.* 35: 896-910.
Published
Refereed?: Yes, Open Access?: No
14. Kaur, R., Awasthi, A., & Grzybowska, K. (2020). Evaluation of Key Skills Supporting Industry 4.0—A Review of Literature and Practice. In *Sustainable Logistics and Production in Industry 4.0.* : 19-29.
Published
Refereed?: Yes, Open Access?: No

15. Verma, M., & Awasthi, A. (2020). Evaluating bikesharing service quality: a case study for BIXI, Montreal. *International Journal of Productivity and Quality Management*. 29(1): 45-61.
Accepted
Refereed?: Yes, Open Access?: No
16. Ramanathan, U., Mazzola, E., Mohan, U., Bruccoleri, M., Awasthi, A., & Garza-Reyes, J. A. (2020). How selection of collaborating partners impact on the green performance of global businesses? An empirical study of green sustainability. *Production Planning & Control*. : 1-16.
Published
Refereed?: Yes, Open Access?: No
17. Ezzati, S., Palma, C. D., Bettinger, P., Eriksson, L. O., & Awasthi, A. (2020). An integrated multi-criteria decision analysis and optimization modeling approach to spatially operational road decisions. *Canadian Journal of Forest Research*.
Published
Refereed?: Yes, Open Access?: No
18. Narwane, V. S., Raut, R. D., Mangla, S. K., Gardas, B. B., Narkhede, B. E., Awasthi, A., & Priyadarshinee, P. (2020). Mediating role of cloud of things in improving performance of small and medium enterprises in the Indian context. *Annals of Operations Research*. : 1-30.
Published
Refereed?: Yes, Open Access?: No
19. Al Salem, A. A., & Awasthi, A. (2020). New consensus measure for group decision-making based on Spearman's correlation coefficient for reciprocal fuzzy preference relations. *International Journal of Modelling and Simulation*. : 1-13.
Published
Refereed?: Yes, Open Access?: No
20. Zhou, R., Awasthi, A., & Stal-Le Cardinal, J. (2020). The main trends for multi-tier supply chain in Industry 4.0 based on Natural Language Processing. *Computers in Industry*. (103369)
Published
Refereed?: Yes, Open Access?: No
21. Moein, E., & Awasthi, A. (2020). Carsharing customer demand forecasting using causal, time series and neural network methods: a case study. *International Journal of Services and Operations Management*. 35(1): 36-57.
Published
Refereed?: Yes, Open Access?: No
22. Awasthi A., Omrani H., Gerber P. (2019). Investigating ideal-solution based multicriteria decision making techniques for sustainability evaluation of urban mobility projects. *Transportation Research A*. 116: 247-259.
Published
Refereed?: Yes, Open Access?: No
23. Afify B., Ray S., Soeanu A., Awasthi A., Debbabi M., Allouche M. (2019). Evolutionary learning algorithm for reliable facility location under disruption. *Expert Systems with Applications*. 115: 223-244.
Published
Refereed?: Yes, Open Access?: No
24. Shashikumar S., Raut R.D., Narwane V.S., Gardas B.B., Narkhede B. E., Awasthi A. (2019). A Novel Approach to determine the Cell Formation using Heuristics Approach. *OPSEARCH*.
Accepted
Refereed?: Yes, Open Access?: No

25. Al Garni H. Z., Awasthi A., Wright D. (2019). Optimal orientation angles for maximizing energy yield for solar PV in Saudi Arabia. *Renewable Energy*. 133: 538-550.
Published
Refereed?: Yes, Open Access?: No
26. Bag S., Tiwari M.K., Kumar S., Awasthi A., (2019). A noise correction-based approach to support a recommender system in a highly sparse rating environment. *Decision Support Systems*.
Published
Refereed?: Yes, Open Access?: No
27. Kaur R. Awasthi A. (2018). City Logistics: a review and bibliometric analysis. *International Journal of Bibliometrics in Business and Management*. 1(2): 160-188.
Published
Refereed?: Yes, Open Access?: No
28. Kaur J., Sidhu R., Awasthi A., Srivastava S. K. (2018). A Pareto investigation on critical barriers in green supply chain management. *International Journal of Management Science and Engineering Management*. : 1-11.
Published
Refereed?: Yes, Open Access?: No
29. Kaur J., Anjali Awasthi. (2018). A systematic literature review on barriers in green supply chain management. *International Journal of Logistics Systems and Management*. 30(3): 330-348.
Accepted
Refereed?: Yes, Open Access?: No
30. Sayyadi, R., Awasthi, A. (2018). A simulation-based optimisation approach for identifying key determinants for sustainable transportation planning. *International Journal of Systems Science: Operations and Logistics*. 5(2): 161-174.
Published
Refereed?: Yes, Open Access?: No
31. Al Garni H.Z., Awasthi A., Ramli MAM. (2018). Optimal design and analysis of grid connected photovoltaic under different tracking systems using HOMER. *Energy Conversion and Management*. 155: 42-57.
Published
Refereed?: Yes, Open Access?: No
32. Awasthi A., Omrani H. (2018). A goal-oriented approach based on fuzzy axiomatic design for sustainable mobility project selection. *International Journal of Services and Operations Management*. : 1-13.
Published
Refereed?: Yes, Open Access?: No
33. Kaur J., Sidhu R, Awasthi A., Chauhan S S, Goyal S. (2018). A DEMATEL based approach for investigating barriers in green supply chain management in Canadian manufacturing firms. *International Journal of Production Research*. 56(1-2): 312-332.
Published
Refereed?: Yes, Open Access?: No
34. Chakraborty T., Chauhan S.S., Awasthi A., Bouzdine-Chameeva T. (2018). Two-period pricing and ordering policy with price sensitive uncertain demand. *Journal of Operational Research Society*. : 1-18.
Published
Refereed?: Yes, Open Access?: No
35. Awasthi A., Omrani H. (2018). A scenario simulation approach for sustainable mobility project evaluation based on fuzzy cognitive maps. *International Journal of Modelling and Simulation*. : 1-11.
Published
Refereed?: Yes, Open Access?: No

36. Mobtaker A., Awasthi A., Chauhan S.S., Sophie DAmours. (2018). Wood based construction project supplier selection under uncertain starting date. *International Journal of Services and Operations Management*. 30(4): 480-504.
Published
Refereed?: Yes, Open Access?: No
37. Mahvash B., Awasthi A., Chauhan S.S. (2018). A column generation-based heuristic for the three-dimensional bin packing problem with rotation. *Journal of the Operational Research Society*,. 69(1): 78-90.
Published
Refereed?: Yes, Open Access?: No
38. Awasthi A., Sayyadi R., Khabbazian A. (2018). A combined approach integrating Gap analysis, QFD and AHP for improving logistics service quality. *International Journal of Logistics Systems and Management*. 29(2): 190-214.
Published
Refereed?: Yes, Open Access?: No
39. Noshad K., Awasthi A. (2018). Investigating critical criteria for supplier quality development. *International Journal of Management Science and Engineering Management*. : 1-10.
Accepted
Refereed?: Yes, Open Access?: No
40. Awasthi A., Govindan K., Gold S. (2018). Multi-tier sustainable global supplier selection using a fuzzy AHP-VIKOR based approach. *International Journal of Production Economics*. 195: 106-117.
Published
Refereed?: Yes, Open Access?: No
41. Al Salem A., Aqeel, Awasthi A. (2018). Investigating rank reversal in reciprocal fuzzy preference relationbased on additive consistency: Causes and solutions,. *Computers & Industrial Engineering*. (115): 573-581.
Published
Refereed?: Yes, Open Access?: No

Books

1. N Chemma, M El Amine Abdelli, A Awasthi, E Mogaji. (2022). *Management and Information Technology in the Digital Era: Challenges and Perspectives*.
Published, Emerald Publishing Limited
Refereed?: Yes
2. Awasthi A. (Eds.). (2021). *Mobility Management in Urban Areas: Models and Perspectives*.
Published, NovaScience
Refereed?: Yes
3. Awasthi A., Grzybowska K. (Eds). (2019). *Handbook of Research on Interdisciplinary Approaches to Decision Making for Sustainable Supply Chain*.
In Press, IGI Global
Refereed?: Yes
4. Awasthi A. (Eds.). (2019). *Sustainable City Logistics Planning: Methods and Applications*.
In Press, NovaScience
Refereed?: Yes
5. Grzybowska K., Awasthi A., Sawhney R. K. (Eds). (2019). *Sustainable Logistics and Production in Industry 4.0 new opportunities and challenges*.
In Press, Springer
Refereed?: Yes

6. Prasenjit Chatterjee, Pamucar, D., Yazdani, M., & Awasthi, A. (2019). AAP Research Notes on Optimization and Decision Making Theories. Published, Apple Academic Press
Refereed?: Yes

Book Chapters

1. Nia, A. R., Awasthi, A., & Bhuiyan, N. (2020). Management of Sustainable Supply Chain and Industry 4.0: A Literature Review. Usha Ramanathan, Ramakrishnan Ramanathan. Sustainable Supply Chains: Strategies, Issues, and Models. : 1-47.
Published, Springer
Refereed?: Yes
2. Grzybowska, K., & Awasthi, A. (2020). Literature Review on Sustainable Logistics and Sustainable Production for Industry 4.0. Grzybowska, K., Awasthi, A., Sawhney R. In Sustainable Logistics and Production in Industry 4.0. : 1-18.
Published, Springer, Cham.
Refereed?: Yes
3. Awasthi, A., & Gold, S. (2020). Global Sustainable Supplier Selection: A Literature Review. Awasthi A. In Handbook of Research on Interdisciplinary Approaches to Decision Making for Sustainable Supply Chains. : 1-31.
Published, IGI Global
Refereed?: Yes
4. Al Garni H. Z., Awasthi A. (2018). Solar PV Power Plants Site Selection: A Review. I. Yahyaoui. Advances in Renewable Energies and Power Technologies. : 57-75.
Accepted, Elsevier
Refereed?: Yes

Conference Publications

1. Anjali Awasthi, Pradeep Mishra. (2023). Green Hydrogen Supply Chain Ecosystem in India- Cost, Technology & Policy Perspective. SOM 2023, (1-5)
Paper
Published
Refereed?: Yes, Invited?: No
2. Murali Vakada, Anjali Awasthi. (2023). Evaluating charging infrastructure demand and performance parameters for a university electric bus fleet. ORSI, (1-5)
Paper
Published
Refereed?: Yes, Invited?: No
3. Nipane, A. P., & Awasthi, A. (2021). *Interconnection Between Human's Psychological Elements and Their Influential Mediums and Channels Are Potential Accelerators to Comprehend People's Inclination Towards Autonomous Vehicles* (No. 5522). EasyChair.. IEEE 1st International Conference on Autonomous Systems (ICAS'21), (1-18)
Paper
Accepted
Refereed?: Yes, Invited?: No

4. Ahmad, S., Enshaei, N., Naderkhani, F., & Awasthi, A. (2020). Integrated Deep Learning and Statistical Process Control for Online Monitoring of Manufacturing Processes. In 2020 IEEE International Conference on Prognostics and Health Management (ICPHM) (pp. 1-6). IEEE., (1-6)
Conference Date: 2020/6
Paper
Published
Refereed?: Yes, Invited?: No
5. Kaur R., Awasthi A. (2019). Cross-disciplinary workforce selection for Industry 4.0. ICITL 2019, Windsor, (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
6. Ali Khabbazian, Anjali Awasthi, Chauhan Satyaveer. (2019). Supplier quality evaluation and order quantity allocation in pharmaceutical supply chains. CIGI QUALITA 2019, Montreal, (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
7. Gul Hassan, Taiwo Adetiloye, Shahab Mosallaie, Anjali Awasthi. (2019). A game theory based approach for collaboration strategy selection among supply chain partners. CIGI QUALITA 2019, (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
8. Tavassoli A., Awasthi A. (2018). Benchmarking sustainability performance of organizations using a multicriteria approach with application to Canadian market. Green Supply Chain (GSC 2018) conference, Thessaloniki, (1-5)
Paper
Published
Refereed?: Yes, Invited?: No

Ayda Basyouni

CONTACT INFORMATION

Concordia Institute for Information Systems Engineering
Concordia University, Montreal, Quebec
CANADA H3G 2W1.

E-mail: ayda.basyouni@concordia.ca

AREAS OF EXPERTISE

- **Computer Networks:** Modeling and Simulation; Performance Evaluation; Broadband wireless networks; Relay networks; Network Architectures and protocols; Networks Security; Wireless Networks Security; Cryptography; Cryptographic protocols
- **Optimization:** Optimization algorithms for solving problems such as network flow, shortest path problem, assignment problem, packing problem, routing problem, critical path analysis. All these combinatorial optimization tools are invaluable tools for solving complex systems optimization problems.
- **Resource Management:** Efficient and effective deployment of resources. The developed techniques, while applied to computer networks, can be generalized to include systems resources such as financial resources, inventory, human skills, production resources, and IT resources.
- **Systems Engineering:** Principles of Systems Engineering, Quality Assurance for Systems Engineering, Total Quality Project Management.

EDUCATION

Sept. 2004- Sept. 2008 Concordia University, Montreal, Quebec

Ph.D., Department of Electrical and Computer Engineering

- Thesis topic: Resource Management for Cross-Layered Star and Mesh Networks

1995- 1997 Queens University, Kingston, Ontario

M.Sc. Eng., Department of Electrical and Computer Engineering

- Thesis Title: "Formal Analysis of Wireless Cryptographic Protocols"

1985-1990 Cairo University, Cairo, Egypt

B.Sc. Department of Electronics and Communication Engineering

GRADUATE COURSES

Ph.D. Courses

- Probability and Stochastic Process
- Advanced Digital Wireless Transmission
- Introduction to Telecommunications Networks

M.Sc. Courses

- Cryptology and data security
- Discrete-time control systems
- Coding theory
- Computer communications
- Integrated Network switching techniques

HONORS AND AWARDS

- Nominated for 2018-2019 and 2019-2020 President's Excellence in Teaching Award
- ENCS Teaching Excellence Award for Sustained Excellence in Teaching 2017-2018
- NSERC PGS B (2004-2006)
- Campaign for a New Millennium Graduate Scholarship (2006-2007)
- Concordia University Internal Award (2004-2006)
- Teaching Fellow 2006-2008
- Queen's University Graduate Award (1995-1997)
- Cairo University undergraduate Award (1985-1990)

TEACHING EXPREIENCE

Senior Lecturer (ETA)

June. 2019- now, CIISE, Concordia University, Quebec, Canada.

Lecturer (ETA)

June 2016- June 2019, CIISE, Concordia University, Quebec, Canada

Lecturer (LTA)

Aug. 2013- May 2016, CIISE, Concordia University, Quebec, Canada.

Courses taught (or being taught) at Concordia

INSE 6110: Foundations of Cryptography (Fall 2013, Winter 2014, Winter 2015, Winter 2016, Winter 2018, Fall 2018, Winter 2019, Fall 2019, Winter 2020, Fall 2020, Winter 2021, Fall 2021, Winter 2022, Fall 2022, Fall 2023, Winter 2024)

INSE 6190: Wireless Network Security (Fall 2016, Summer 2016, Fall 2016, Winter 2017, Summer 2017, Fall 2017, Summer 2018, Fall 2018, Fall 2019, Winter 2020, Summer 2020, Winter 2021, Summer 2021, Winter 2022, Summer 2022, Summer 2023)

INSE 6230: Total Quality Project Management (Winter 2014, Winter 2015 and Summer 2015)

INSE 6270: Quality-Based Systems Engineering (Winter 2014, Summer 2014, Fall 2014 and Fall 2015, Fall 2016, Winter 2017, Fall 2017, Winter 2018, Winter 2019, Winter 2020)

INSE 6280: Quality Assurance for Systems Engineering (Fall 2013, Fall 2014, Winter 2015, Fall 2015 and Winter 2016, Fall 2016, Winter 2017, Fall 2017, Winter 2018, Fall 2018, Winter 2019, Fall 2019, Fall 2020, Fall 2021, Fall 2022, Fall 2023)

INSE 6400: Principles of Systems Engineering (Fall 2013, Fall 2014 and Winter 2016, Fall 2021).

I

NSE 6961: Graduate Seminar in Information & Systems Engineering (Fall 2020, Winter 2021, Summer 2021, Fall 2021, Winter 2022, Summer 2022, Fall 2022, Winter 2023, Fall 2023, Winter 2024).

Before joining CIISE at Concordia

Sept. 2006 - Sept. 2008, Teaching Assistant, Concordia University, Canada.

Sept. 1995 - August 1997, Teaching Assistant, Queen's University, Kingston, Ontario.

Responsibilities

- Prepare course materials and presentations
- Attend tutorials, labs, and substitute lecturers.

SERVICES

- CIISE M.Eng. Graduate Program Director June 2020 – now
- QSE Co-op program director September 2019- June 2021
- Judge in Engineering & Commerce Case Competition (ENGCOMM) (January 2020, October 2020, January 2021, January 2022)
- Member of the Council of the School of Graduate Studies Fall 2020- Summer 2021.
- Member of post-COVID University Education/Life (Jan.2021- May 2021) meeting every two weeks.
- Member of panelist for GirlSET event, Women in Engineering, Summer 2022.

I also served of the following committees:

- CIISE Graduate Curriculum Committee
- CIISE Admissions Committee
- CIISE Awards Committee
- CIISE Supervision Committee
- CIISE Teaching and Learning Committee
- CIISE Recruitment Committee
- Gina Cody Selection Committee for Teaching Excellence Awards (2018-2019) and (2019-2020)

RESEARCH EXPREIECE

Nov. 2008 – Oct. 2009, *Postdoctoral Fellow, Concordia University, Montreal, Quebec*

Sept. 2004 – Sept. 2008, *Research Assistance, Concordia University, Montreal, Quebec*

Responsibilities

- Conduct research in the area of resource management for wireless data networks
- Review related literature, and industrial standards
- Propose and evaluate new solutions through analytical modeling and simulation (Using C++ O.O.P)

Sept. 1995 - Dec. 1997, *Queen's University, Kingston, Ontario.*

Responsibilities

- Conduct research in the area wireless networks security
- Develop a Petri-net based tool for automatic verification of wireless security protocols (Using C++ O.O.P)

THESIS AND PUBLICATIONS

A. Basyouni, "**Analysis of Wireless Cryptographic Protocols.**" M.Sc. Eng. Thesis, Queen's University, 1997.

Ayda Basyouni, "**Resource Management for Cross Layered Star and Mesh Networks.**" P.hD. Thesis, Concordia University, 2008

Journal Papers:

- Ayda Basyouni, Walaa Hamouda and Amr M. Youssef, "**Cooperative Relaying Protocol for Energy-constrained Ad-hoc Networks,**" *IET (formerly IEE) Proceedings-Communications, Vol 5, Issue 4, Page(s): 418 – 424, 2011.*
- Ayda Basyouni, Walaa Hamouda and Amr M. Youssef, "**Improved Channel Access Protocol for Cooperative Ad-Hoc Networks,**" *IET (formerly IEE) Proceedings-Communications, vol. 3, no. 7, pp. 915-923, Aug. 2010.*
- Ayda Basyouni, Anjali Agarwal, and Ahmed Elhakeem, "**An Analytical Model for Reverse Data Channel Scheduling Techniques in cdma2000 1xEV-DO,**" *Journal of Wireless Communications and Mobile*

Computing, Volume 9, Issue 1, January 2009, Pages: 61-70.

- Ayda Basyouni, Anjali Agarwal, and Ahmed Elhakeem, **“Performance Analysis of the cdma2000 Reverse Packet Data Channel,”** International Journal of Communication Networks and Distributed Systems, Volume 2, Issue 2/3, 2009, Pages: 160-180.
- Ayda Basyouni, Ahmed Elhakeem, and Anjali Agarwal, **“Efficient Resource Management for Packet Mode cdma2000,”** European Transactions on Telecommunications, Volume 20, Issue 1, January 2009, Pages: 203-215.

Conference Papers:

- Ayda Basyouni, Walaa Hamouda and Amr M. Youssef, **“A New Rate Control Technique for cdma2000 1xEV,”** IEEE Global Telecommunications Conference (GLOBECOM 2010), Miami, Florida, Dec. 2010.
- Ayda Basyouni, Walaa Hamouda and Amr M. Youssef, **“On Reducing Blocking Probability in Cooperative Ad-hoc Networks,”** IEEE Global Telecommunications Conference (GLOBECOM 2009), Hawaii, Nov. 2009.
- Ayda Basyouni, Anjali Agarwal, and Ahmed Elhakeem, **“A Slot Allocation Technique for WiMAX Backhaul Networks.”** 24th Queen's Biennial Symposium on Communications, June, 2008, Kingston Canada.
- Ayda Basyouni, Anjali Agarwal, and Ahmed Elhakeem, **“Performance Analysis of cdma2000 Reverse Packet Data Channel,”** Proc. of the Second International Conference on Access Networks (ACCESSNETS 2007), Ottawa Canada
- Ayda Basyouni, Ahmed Elhakeem, and Anjali Agarwal, **“Maximizing the Reverse Link Throughput for cdma2000 1xEV-DO Using Particle Swarm Optimization,”** Proc. of the Seventh International Conferences on Wireless and Optical Communications (WOC 2007), Montreal Canada

- Ayda Basyouni, Ahmed Elhakeem, and Anjali Agarwal, "**A dynamic scheduling scheme for the reverse packet data channel in cdma2000 1xEV-DV**," Proc. of the IEEE Canadian conference in Electrical and Computer Engineering, CCECE'2006, Ottawa, Canada, May 2006

- Ayda Basyouni, Ahmed Elhakeem, and Anjali Agarwal, "**On Rate Assignment Schemes for the Reverse Packet Data Channel in cdma2000 1xEV-DV**," Proc. of the 64th IEEE Vehicular Technology conference, VTC 2006, September 2006

- A. Basyouni and S. Tavares "**New Approach to Cryptographic Protocol Analysis using Coloured Petri Nets.**" Proceeding of the Canadian Conference on Electrical and Computer Engineering (CCECE'97), May 1997

- A. Basyouni and S. Tavares "**Public Key versus Private Key in Wireless Authentication Protocols.**" Proceeding of the Canadian Workshop on Information Theory, June 1997

WORKING EXPREIENCE

Software Developer

Dec. 1990 - Oct. 1993, Arabic Information Systems (INFO ARAB), Cairo, Egypt, R&D department, Macintosh development section

Responsibilities

I was part of the team that developed the first Arabic language spell and grammar checker; currently used within several applications by licensing. Throughout this project I worked as software developer, analyst, and designer. I lead the project development team from January 1992- October 1993

Computer instructor

Sep. 1990 - Dec. 1990, The "Wissam" company for electronics design and manufacturing, Cairo, Egypt.



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Protected when completed

Dr. Abdessamad Ben Hamza

Correspondence language: English

Contact Information

The primary information is denoted by (*)

Address

Primary Affiliation (*)

1455 de Maisonneuve Blvd. West, EV7.631
Montréal Quebec H3G 1M8
Canada

Telephone

Work (*) 1-514-848-2424 extension: 5383

Email

Work (*) hamza@ciise.concordia.ca



This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Protected when completed

Dr. Abdessamad Ben Hamza

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes
Spanish; Castilian	Yes	Yes	Yes	Yes	Yes

Degrees

- 2004/8 Post-doctorate, Electrical and Computer Engineering, Duke University
- 2003/12 Doctorate, Electrical and Computer Engineering, North Carolina State University
- 2001/2 Research Associate, Electrical and Computer Engineering, North Carolina State University
- 1997/11 Master's Thesis, Applied Mathematics, Universidad de Granada
- 1993/6 Bachelor's, Mathematics, University of Tetouan, Morocco

Recognitions

- 2022/1 Outstanding Reviewer Award for IEEE Transactions on Multimedia
IEEE
Prize / Award
IEEE

User Profile

Research Specialization Keywords: Computer vision, Deep Learning, Geometry processing, Image processing, Machine Learning

Employment

- 2016/6 Professor
Concordia Institute for Information Systems Engineering, Concordia University
Full-time, Professor
Tenure Status: Tenure

2018/6 - 2023/5	<p>Department Chair Concordia Institute for Information Systems Engineering, Concordia University Full-time, Professor Tenure Status: Tenure During my tenure as chair for the 5-year term, my responsibilities encompassed a range of crucial tasks. These include offering both academic and administrative guidance, spearheading the implementation of strategic academic plans to enhance and uphold the standard of teaching and research within the Department. Another key aspect of my role involved taking the lead in recruiting faculty and staff members, ensuring the selection of individuals who align with our department's vision. I also conducted comprehensive evaluations of faculty performance, fostering an environment of continuous improvement.</p>
2014/6 - 2016/5	<p>Associate Department Chair Concordia Institute for Information Systems Engineering, Concordia University Full-time, Associate Professor Tenure Status: Tenure Assist and advise the Department Chair on all matters of substance, including course assignments and course releases, and also prepare the departmental schedule of classes for fall, spring and summer sessions.</p>
2009/6 - 2016/5	<p>Associate Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Associate Professor Tenure Status: Tenure</p>
2013/6 - 2014/5	<p>Graduate Program Director Concordia Institute for Information Systems Engineering, Concordia University Full-time, Associate Professor Tenure Status: Tenure Recruit and facilitate the admission of graduate students; respond to inquiries from prospective applicants; work with graduate faculty to develop curriculum and courses.</p>
2009/6 - 2011/5	<p>Graduate Program Director Concordia Institute for Information Systems Engineering, Concordia University Full-time, Associate Professor Tenure Status: Tenure Recruit and facilitate the admission of graduate students; respond to inquiries from prospective applicants; work with graduate faculty to develop curriculum and courses.</p>
2004/9 - 2009/5	<p>Assistant Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Assistant Professor Tenure Status: Tenure Track</p>

Research Funding History

Awarded [n=4]

2024/2 - 2027/1 Co-investigator	<p>A Universal AI-Powered IoT Platform for Smart Buildings: Data-Driven Insights with Privacy Focus, Grant</p> <p>Funding Sources: Concordia's Volt-Age applied research program Total Funding - 200,000 Portion of Funding Received - 66,666 Funding Competitive?: Yes</p>
2023/4 - 2026/3	<p>Automatic Identification of Extremist Content on the Web, Grant</p>

Co-investigator	<p>Funding Sources: Fonds de recherche du Québec - Nature et technologies (FRQNT) Projet de recherche en équipe Total Funding - 150,000 Portion of Funding Received - 50,000 Funding Competitive?: Yes</p> <p>Co-investigator : Omar Abdelwahab; Principal Investigator : Nizar Bouguila</p>
2018/4 - 2024/3 Principal Investigator	<p>Learning graph representations for intelligent visual computing, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) NSERC Discovery Total Funding - 168,000 Portion of Funding Received - 168,000 Funding Competitive?: Yes</p>
2020/9 - 2022/8 Principal Applicant	<p>Using semi-supervised learning for classification of sport images, Fellowship</p> <p>Funding Sources: Mitacs Mitacs Accelerate Total Funding - 60,000 Portion of Funding Received - 60,000 Funding Competitive?: Yes</p>

Student/Postdoctoral Supervision

Master's Thesis [n=10]

2024/1 - 2025/12 Principal Supervisor	<p>Zahidul Hasan (In Progress) , Concordia University Thesis/Project Title: Transformer-Based Models for 3D Human Motion Prediction Present Position: Research Assistant</p>
2024/1 - 2025/12 Principal Supervisor	<p>Ryan Amstutz (In Progress) , Concordia University Thesis/Project Title: Spatio-Temporal Methods for 3D Human Motion Prediction Present Position: Research Assistant</p>
2023/9 - 2025/8 Principal Supervisor	<p>Abu Taib Mohammed Shahjahan (In Progress) , Concordia University Thesis/Project Title: Robust Approaches to 3D Human Pose Estimation and Motion Prediction Present Position: Research Assistant</p>
2022/9 - 2024/4 Principal Supervisor	<p>Shakib Khan (In Progress) , Concordia University Thesis/Project Title: Graph representation learning for anomaly detection Present Position: Graduate Student, Concordia University</p>
2021/9 - 2023/8 Principal Supervisor	<p>Zaedul Islam (Completed) , Concordia University Thesis/Project Title: Iterative graph filtering networks for 3D human pose estimation Present Position: Software Developer, Plusgrade</p>
2021/1 - 2023/4 Principal Supervisor	<p>Tanvir Hassan (Completed) , Concordia University Thesis/Project Title: Graph neural networks for 3D human pose estimation Present Position: Software Developer, 123Loadboard</p>

2019/9 - 2021/7 Principal Supervisor	Hasib Zunair (Completed) , Concordia University Thesis/Project Title: Designing efficient deep learning models for computer-aided medical diagnosis Present Position: PhD student, Concordia University
2019/6 - 2021/8 Principal Supervisor	Min Wen (Completed) , Concordia University Thesis/Project Title: Towards adaptive federated semi-supervised learning for visual recognition Present Position: Data Engineer, Deloitte
2019/6 - 2021/7 Principal Supervisor	Jianning Quan (Completed) , Concordia University Thesis/Project Title: Pose estimation and object detection using deep convolutional networks Present Position: Machine Learning Engineer, Extend AI
2018/9 - 2020/12 Principal Supervisor	Mahsa Rezaei (Completed) , Concordia University Thesis/Project Title: Learning shape-aware representations for object recognition Present Position: Chief Operating Officer, Technologie Majic3D Inc.
Doctorate [n=8]	
2022/9 - 2027/12 Principal Supervisor	Dalia Alzubi (In Progress) , Concordia University Thesis/Project Title: Transformer Models for Medical Image Segmentation Present Position: Research Assistant
2021/9 - 2024/12 Principal Supervisor	Hasib Zunair (In Progress) , Concordia University Thesis/Project Title: Masked supervised learning Present Position: Research Assistant, Concordia University
2018/1 - 2023/12 Principal Supervisor	Mahsa Mesgaran (Completed) , Concordia University Thesis/Project Title: Graph neural networks for semi-supervised learning and anomaly detection Present Position: Machine Learning Engineer, Cash App
2018/1 - 2024/8 Principal Supervisor	Raed Abdel Sater (In Progress) , Concordia University Thesis/Project Title: Multitask federated learning Present Position: Data science manager, Techo-Bloc, Montreal
2015/9 - 2022/6 Principal Supervisor	Ibrahim Salim (Completed) , Concordia University Thesis/Project Title: Pediatric bone age analysis and brain disease prediction for computer-aided diagnosis Present Position: Assistant Professor, Libya
2015/9 - 2018/9 Principal Supervisor	Lorenzo Luciano (Completed) , Concordia University Thesis/Project Title: Geometric deep learned descriptors for 3D shape recognition Present Position: Senior ML Applied Scientist, Amazon, San Diego, California
2014/6 - 2017/10 Principal Supervisor	Hamed Ghodrati (Completed) , Concordia University Thesis/Project Title: Deep shape representations for deformable 3D object recognition Present Position: Industrial Researcher, Computer Research Institute of Montreal (CRIM)
2014/1 - 2017/6 Principal Supervisor	Majid Masoumi (Completed) , Concordia University Thesis/Project Title: Feature encoding of spectral descriptors for 3D shape recognition Present Position: Director of Innovation and Technology AI Project Lead, Boeuf Québec SPEQ

Event Administration

- 2022/6 - 2022/9 Area Chair, 10th International Conference on 3D Vision (3DV). I monitored and managed the review process for several papers, facilitated discussion after rebuttal, wrote meta-reviews and made acceptance recommendations, Conference, 2022/9 - 2022/9
- 2021/7 - 2021/12 Area Chair, 9th International Conference on 3D Vision (3DV). I monitored and managed the review process for several papers, facilitated discussion after rebuttal, wrote meta-reviews and made acceptance recommendations, Conference, 2021/12 - 2021/12

Editorial Activities

- 2023/9 - 2028/8 Associate Editor, Artificial Intelligence in Health, Journal
- 2022/8 - 2027/7 Associate Editor, Journal of Modern Medical Imaging, Journal
- 2018/1 - 2024/12 Associate Editor, Journal of Machine Intelligence and Data Science, Journal
- 2024/10 - 2024/10 Committee Member, European Conference on Artificial Intelligence (ECAI), Conference Abstract
- 2024/6 - 2024/6 Committee Member, IEEE Workshop on Perception Beyond the Visible Spectrum in Conjunction with CVPR 2024, Conference Abstract
- 2023/6 - 2023/6 Committee Member, IEEE Workshop on Perception Beyond the Visible Spectrum in Conjunction with CVPR 2023, Conference Abstract
- 2023/4 - 2023/4 Committee Member, International Conference on Image Processing and Vision Engineering, IMPROVE, Conference Abstract
- 2022/4 - 2022/4 Committee Member, Committee Member, International Conference on Image Processing and Vision Engineering, IMPROVE, Conference Abstract
- 2022/3 - 2022/3 Committee Member, 9th International Conference on Modeling, Simulation and Applied Optimization, SIAM, Conference Abstract
- 2021/4 - 2021/4 Committee Member, International Conference on Image Processing and Vision Engineering, IMPROVE, Conference Abstract
- 2018/11 - 2018/11 Committee Member, 9th IEEE Annual Ubiquitous Computing, Electronics and Mobile Communication Conference, IEEE, Conference Abstract
- 2018/6 - 2018/6 Committee Member, International Conference on Learning and Optimization Algorithms, OPAL, Conference Abstract
- 2018/4 - 2018/4 Committee Member, 11th Eurographics Workshop on 3D Object Retrieval, Eurographics, Conference Abstract

Organizational Review Activities

- 2018/12 - 2023/1 Reviewer, Natural Sciences and Engineering Research Council of Canada (NSERC) Review Discovery and CRD Grant Proposals

Committee Memberships

- 2018/6 - 2023/5 Committee Member, Department Hiring Committee, Concordia University
- 2018/6 - 2023/5 Committee Member, Department Tenure Committee, Concordia University

2018/6 - 2023/5	Ex-Officio, Gina Cody School of Engineering and Computer Science Council, Concordia University
2018/6 - 2023/5	Ex-Officio, Gina Cody School of Engineering and Computer Science Executive Committee, Concordia University
2018/6 - 2023/5	Committee Member, Department Research Committee, Concordia University
2018/6 - 2018/5	Committee Member, Department Personnel Committee, Concordia University

Other Memberships

2009/3	Senior Member, IEEE
2009/3	Member, Professional Engineers Ontario

Presentations

- (2023). Exploring Deep Learning: Autoencoders and Generative Models. International Conference on Intelligent Systems and Smart Technologies, Settat, Morocco
Invited?: Yes, Keynote?: Yes
- (2022). Deep learning with autoencoders and generative models. 5th International Conference on Intelligent Systems and Computer Vision, Fez, Morocco
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes

Publications

Journal Articles

- Osama Alshareet and A. Ben Hamza. (2024). Adaptive spectral graph wavelets for collaborative filtering. Pattern Analysis and Applications.
Published
Refereed?: Yes, Open Access?: No
- Ibrahim Salim and A. Ben Hamza. (2024). Classification of developmental and brain disorders via graph convolutional aggregation. Cognitive Computation.
Published
Refereed?: Yes, Open Access?: No
- Zaedul Islam* and A. Ben Hama. (2023). Iterative graph filtering network for 3D human pose estimation. Journal of Visual Communication and Image Representation.
Published
Refereed?: Yes
- Ibrahim Salim and A. Ben Hamza. (2023). Classification of developmental and brain disorders via graph convolutional aggregation. Cognitive Computation.
Accepted
Refereed?: Yes, Open Access?: No
- Tanvir Hassan* and A. Ben Hamza. (2023). Regular splitting graph network for 3D human pose estimation. IEEE Transactions on Image Processing.
Published
Refereed?: Yes

6. Mahsa Mesgaran* and A. Ben Hamza. (2023). Graph fairing convolutional networks for anomaly detection. *Pattern Recognition*.
Published
Refereed?: Yes
7. Mahsa Mesgaran* and A. Ben Hamza. (2023). A graph encoder-decoder network for unsupervised anomaly detection. *Neural Computing and Applications*.
Published
Refereed?: Yes
8. Ruchika Verma et al. (2021). MoNuSAC2020: A Multi-organ nuclei segmentation and classification challenge. *IEEE Transactions on Medical Imaging*.
Published
Refereed?: Yes
9. L. Luciano*, I. Kiss, P.W. Beardshear, E. Kadosh, and A. Ben Hamza. (2021). WISE: a computer system performance index scoring framework. *Journal of Cloud Computing*.
Published
Refereed?: Yes, Open Access?: Yes
10. H. Zunair* and A. Ben Hamza. (2021). Synthesis of COVID-19 chest X-rays using unpaired image-to-image translation. *Social Network Analysis and Mining*.
Published
Refereed?: Yes
11. Raed Abdel Sater* and A. Ben Hamza. (2021). A federated learning approach to anomaly detection in smart buildings. *ACM Transactions on Internet of Things*.
Published
Refereed?: Yes
12. I. Salim* and A. Ben Hamza. (2021). Ridge regression neural network for pediatric bone age assessment. *Multimedia Tools and Applications*.
Published
Refereed?: Yes
13. Hasib Zunair* and A. Ben Hamza. (2021). Sharp U-Net: Depthwise convolutional network for biomedical image segmentation. *Computers in Biology and Medicine*.
Published
Refereed?: Yes
14. M. Mesgaran* and A. Ben Hamza. (2021). Anisotropic graph convolutional network for semi-supervised learning. *IEEE Transactions on Multimedia*.
In Press
Refereed?: Yes
15. H. Zunair* and A. Ben Hamza. (2020). Melanoma detection using adversarial training and deep transfer learning. *Physics in Medicine & Biology*. 65(13)
Published
Refereed?: Yes
16. L. Luciano* and A. Ben Hamza. (2019). Deep similarity network fusion for 3D shape classification. *The Visual Computer*.
Published
Refereed?: Yes
17. L. Luciano* and A. Ben Hamza. (2019). A global geometric framework for 3D shape retrieval using deep learning. *Computers & Graphics*.
Published
Refereed?: Yes

18. H. Ghodrati*, L. Luciano*, A. Ben Hamza. (2019). Convolutional shape-aware representation for 3D object classification. *Neural Processing Letters*.
Published
Refereed?: Yes
19. M. Masoumi*, M. Rezaei* and A. Ben Hamza. (2018). Global spectral graph wavelet signature for surface analysis of carpal bones. *Physics in Medicine & Biology*.
Published
Refereed?: Yes
20. I. Salim* and A. Ben Hamza,. (2018). Fast feature-preserving approach to carpal bone surface denoising. *Sensors*.
Published
Refereed?: Yes, Open Access?: Yes

Book Chapters

1. M. Masoumi*, M. Rezaei*, and A. Ben Hamza. (2019). Shape analysis of carpal bones using spectral graph wavelets. *Vertex-Frequency Analysis of Graph Signals*. : 419-436.
Published, Springer
Refereed?: Yes

Conference Publications

1. Hasib Zunair and A. Ben Hamza. (2024). Learning to recognize occluded and small objects with partial inputs. *Proc. IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*,
Paper
Published
Refereed?: Yes, Invited?: No
2. Tanvir Hassan* and A. Ben Hamza. (2023). Spatio-temporal MLP-graph network for 3D human pose estimation. *34rd British Machine Vision Conference (BMVC)*,
Conference Date: 2023/11
Paper
Accepted
Refereed?: Yes, Invited?: No
3. H. Zunair* and A. Ben Hamza. (2022). Masked supervised learning for semantic segmentation. *33rd British Machine Vision Conference (BMVC)*, United Kingdom
Conference Date: 2022/11
Paper
Published
Refereed?: Yes, Invited?: No
4. H. Zunair*, Y. Gobeil, S. Mercier, and A. Ben Hamza. (2022). Fill in fabrics: Body-aware self-supervised inpainting for image-based virtual try-on. *33rd British Machine Vision Conference (BMVC)*, United Kingdom
Conference Date: 2022/11
Paper
Published
Refereed?: Yes, Invited?: No
5. Jianning Quan* and A. Ben Hamza. (2021). Higher-order implicit fairing networks for 3D human pose estimation. *32nd British Machine Vision Conference (BMVC)*, United Kingdom
Conference Date: 2021/11
Paper
Published
Refereed?: Yes, Invited?: No

6. Hasib Zunair*, Yan Gobeil, Samuel Mercier, A Ben Hamza. (2021). STAR: Noisy Semi-supervised transfer learning for visual classification. ACM Multimedia Conference. International Workshop on Multimedia Content Analysis in Sports, China
Conference Date: 2021/10
Paper
Published
Refereed?: Yes, Invited?: No
7. H. Zunair* and A. Ben Hamza. (2021). Synthetic COVID-19 chest X-ray dataset for computer-aided diagnosis. Proc. International Conference on Machine Learning (ICML) Workshop on Computational Biology,
Conference Date: 2021/7
Paper
Published
Refereed?: Yes, Invited?: No
8. L. Luciano* and A. Ben Hamza,. (2018). Geodesic-based 3D shape retrieval using sparse autoencoders. Euro-graphics workshop on 3D Object Retrieval,
Paper
Published
Refereed?: Yes, Invited?: No



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Dr. Nizar Bouguila

Correspondence language: English

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The primary information is denoted by (*)

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Dr. Nizar Bouguila

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes

Degrees

- 2006/4 Doctorate, Computer Science, Université de Sherbrooke
Supervisors: Ziou, Djemel, 2003/1 - 2006/4
- 2002/12 Master's Thesis, Computer Science, Université de Sherbrooke
Supervisors: Vaillancourt, Jean, 2001/1 - 2002/12; Ziou, Djemel, 2001/1 - 2002/12
- 2000/6 Bachelor's, Computer Engineering, Université de Tunis

Recognitions

- 2023/6 - 2028/5 Concordia University Research Chair Tier 1 in Applied AI
Concordia University
Distinction
This distinction is awarded, based on research record, via internal competition at the level of the faculty and then at the level of the university.
- 2023/1 Gina Cody Research and Innovation Fellow - 45,000
Concordia University
Distinction
Gina Cody School of Engineering and Computer Science, Concordia University
- 2022/8 Best paper presentation award, IEEE ICIT 2022
IEEE International Conference on Industrial Technology
Prize / Award
Best paper presentation award with my students K. Ketabchi and N. Manouchehri, 23rd IEEE International Conference on Industrial Technology (IEEE ICIT 2022), "Fully Bayesian Libby-Novick Beta Mixture Model with Feature Selection", August 2022.
- 2022/7 Best paper award, IEA/AIE 2022
International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Syst
Prize / Award
Best paper award with my student Jiaxun Guo, Dr. Manar Amayri and Prof. Wentao Fan, 35th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2022), "A Generalized Inverted Dirichlet Predictive Model for Activity Recognition using Small Data"

- 2021/8 Best student paper award, IEEE IRI 2021
IEEE
Prize / Award
Best student paper award with my students Zixiang Xian and Muhammad Azam, 22nd IEEE International Conference on Information Reuse and Integration for Data Science (IRI 2021), "Statistical Modeling using Bounded Asymmetric Gaussian Mixtures: Application to Human Action and Gender Recognition"
- 2021/5 Best poster award, FLAIRS-34
FLAIRS
Prize / Award
Best poster award with my students Xuanbo Su and Nuha Zamzami, 34rd International Conference of the Florida Artificial Intelligence Research Society (FLAIRS-34), "Covid-19 News Clustering using MCMC-Based learning of Finite EMSD Mixture Models"
- 2020/6 - 2021/5 Concordia University Research Fellow - 5,000
Concordia University
Distinction
Concordia University Research Fellow for the Award in Category B – for researchers who are working toward facilitating and building upon their track record of research excellence, leadership, productivity and influence.
- 2019/8 Best paper award, IRI 2019
IEEE
Prize / Award
Best paper award with my students Hieu Nguyen, Meeta Kalra, and Muhammad Azam, 20th IEEE International Conference on Information Reuse and Integration for Data Science (IRI2019), "Data Clustering using Online Variational Learning of Finite Scaled Dirichlet Mixture Models"
- 2018/6 Best paper award, IEA/AIE 2018
International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Syst
Prize / Award
Best paper award with my student Nuha Zamzami, 31st International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2018), "Text modeling Using Multinomial Scaled Dirichlet Distributions"
- 2017/6 - 2019/5 Concordia University Research Chair Tier 2
Concordia University
Distinction
This distinction is awarded, based on research record, via internal competition at the level of the faculty and then at the level of the university.
- 2017/5 Teaching award
Concordia University
Prize / Award
CIISE teaching excellence award.

User Profile

Research Specialization Keywords: Data mining, data analysis, statistics, machine learning, pattern recognition, computer vision, image processing, Health informatics, smart buildings

Employment

2021/9	<p>Founding Director of the Concordia Applied AI Institute Concordia Applied AI Institute, Concordia University Full-time Tenure Status: Non Tenure Track</p>
2018/6	<p>Founder & Director of the Explainable AI (XAI) Lab Explainable AI Lab, Concordia University Full-time Tenure Status: Non Tenure Track</p>
2016/6	<p>Professor CIISE, Engineering and Computer Science, Concordia University Full-time Tenure Status: Tenure</p>
2010/6 - 2016/5	<p>Associate Professor CIISE, Engineering and Computer Science, Concordia University Full-time Tenure Status: Tenure</p>
2006/6 - 2010/5	<p>Assistant Professor CIISE, Engineering and Computer Science, Concordia University Full-time Tenure Status: Tenure Track</p>
2006/1 - 2006/4	<p>Lecturer Administration, Université de Sherbrooke Part-time Tenure Status: Non Tenure Track</p>
2001/4 - 2006/4	<p>Teaching assistant Mathématiques-informatique, Sherbrooke University, Université de Sherbrooke Part-time Tenure Status: Non Tenure Track</p>
2001/1 - 2006/4	<p>Research assistant Mathématiques-informatique, Sherbrooke University, Université de Sherbrooke Full-time Tenure Status: Non Tenure Track</p>
2005/12 - 2006/2	<p>Statistical Analyst Géomatique, Environment Canada</p>
2005/9 - 2005/12	<p>Lecturer Computer Science, Bishop's University, Bishop's University Part-time Tenure Status: Non Tenure Track</p>
2000/2 - 2000/7	<p>Intern Informatique, Grenoble Institute of Technology, Institut national polytechnique de Grenoble Part-time Tenure Status: Non Tenure Track</p>

Research Funding History

Awarded [n=8]

2023/4 - 2028/3
Principal Investigator A unified framework for interactive explainable unsupervised learning and unsupervised model adaptation: Application to multimodal activity recognition, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery

Total Funding - 230,000

Funding Competitive?: Yes

2022/4 - 2027/3
Co-applicant Assessing the usability and acceptability of iCANPlate, a mobile dietary self-monitoring tool that aligns with Canada's food guide: a multi-methods study, Grant

Funding Sources:

Canadian Institutes of Health Research (CIHR)

Total Funding - 378,675

Funding Competitive?: Yes

Co-applicant : A. Alberga; Jean-Philippe Gouin; L. Kakinami; R. Rhodes;

Principal Investigator : Tamara Cohen

2023/4 - 2026/3
Principal Investigator Automatic identification of extremist content on the Web, Grant

Funding Sources:

Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT)

Team Research Project

Total Funding - 150,000

Funding Competitive?: Yes

Co-applicant : A. Ben Hamza

2023/1 - 2025/12
Principal Investigator AI for Historical Tourism, Grant

Funding Sources:

Concordia University

Gina Cody Research and Innovation Fellowship

Total Funding - 45,000

Funding Competitive?: Yes

2020/8 - 2025/7
Co-investigator Micro Transit Demand Management (microTDM) with Big Data and Artificial Intelligence, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 2,326,666

Funding Competitive?: Yes

Co-applicant : Owen Waygood;

Principal Investigator : Zachary Patterson

2023/1 - 2024/12
Co-applicant Explainable Interactive Unsupervised Learning for Smart Buildings, Grant

Funding Sources:

Concordia University

AI2 Funding program

Total Funding - 8,000

Funding Competitive?: Yes

- Principal Investigator : Manar Amayri
- 2022/9 - 2024/8
Principal Investigator
- Personalized Conversational Agents for Historical Tourism, Grant
- Funding Sources:**
Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 180,000
Funding Competitive?: Yes
- 2023/4 - 2024/3
Co-applicant
- The impact of Indirect Flexibility of Electric Vehicles Drivers Behavior to Support Decarbonization Solutions, Grant
- Funding Sources:**
Concordia University
Concordia Sustainable Transitions Team Research Initiative
Total Funding - 20,000
Funding Competitive?: Yes
- Co-applicant : Ursula Eicker;
Principal Investigator : Manar Amayri
- Completed [n=28]**
- 2022/4 - 2024/3
Principal Investigator
- An Artificial Intelligence Platform to Support Self-Consumption in a Residential Context, Grant
- Funding Sources:**
Concordia University
Concordia Seed Funding (Individual)
Total Funding - 10,000
Portion of Funding Received - 10,000
Funding Competitive?: Yes
- 2021/9 - 2023/8
Principal Investigator
- Development of an Automatic Recruitment System using Machine Learning Techniques, Grant
- Funding Sources:**
Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 304,000
Portion of Funding Received - 304,000
Funding Competitive?: Yes
- 2022/3 - 2023/6
Co-applicant
- Harnessing Screen Content for the Well-Being of Long Term Care Residents: A Human Expertise/Artificial Intelligence Endeavour to Counteract COVID Related Social Isolation, Grant
- Funding Sources:**
Social Sciences and Humanities Research Council of Canada (SSHRC)
New Frontiers in Research Fund (NFRF)
Total Funding - 250,000
Portion of Funding Received - 40,000
Funding Competitive?: Yes
- Co-applicant : Marta Kersten;
Co-investigator : Santiago Hidalgo;
Collaborator : Adriana Lacerda; Caroline Ménard; Habib Benali; Najmeh Khalili-Mahani; Pierre Rainville;

Principal Investigator : Ana Inés Ansaldo

2020/7 - 2023/5
Principal Investigator Improve Workplace Wellbeing using AI and Organizational Behavior Software Platform,
Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 133,333

Portion of Funding Received - 133,333

Funding Competitive?: Yes

2021/5 - 2023/4
Principal Investigator Advanced AI for Demand Forecast, Assortment Planning and Plan Monitoring in Fashion
and Apparel Retailing, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 801,666

Funding Competitive?: Yes

2017/4 - 2023/3
Principal Investigator Time-sensitive non-parametric Bayesian approaches for event modeling, recognition and
prediction, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery

Total Funding - 128,000

Portion of Funding Received - 128,000

Funding Competitive?: Yes

2022/3 - 2022/10
Co-applicant Developing a New Workflow for Occupancy Estimation using Wi-Fi Sensing for Building
Energy Simulation, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 30,000

Portion of Funding Received - 15,000

Funding Competitive?: Yes

Principal Investigator : Ursula Eicker

2020/1 - 2022/10
Co-applicant Joule M&V AI, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Accelerate

Total Funding - 160,000

Portion of Funding Received - 40,000

Funding Competitive?: Yes

Co-applicant : F. Haghighat; H. Rivaz;

Principal Investigator : Fuzhan Nasiri

2022/6 - 2022/9
Principal Investigator ML-Based Video Timewraps, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

MITACS Accelerate Assessment

Total Funding - 12,000

Portion of Funding Received - 12,000

Funding Competitive?: Yes

2021/9 - 2022/8
Principal Investigator Optimizing Return on Investment using Artificial Intelligence: A Recommendation System-
Based Solution, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate

Total Funding - 93,333

Portion of Funding Received - 93,333

Funding Competitive?: Yes

2020/4 - 2022/8
Principal Investigator Analytics on 5G – Topology through PM correlation, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate

Total Funding - 360,000

Portion of Funding Received - 360,000

Funding Competitive?: Yes

2020/8 - 2022/7
Principal Investigator Development of a solution to assess the quality and to optimize AI-based video codecs,
Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate

Total Funding - 90,000

Portion of Funding Received - 90,000

Funding Competitive?: Yes

2022/1 - 2022/6
Principal Investigator Testing, Validation and QA of Computer Vision Models & Data Sets in a Novel SAAS
Environment, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Mitacs Accelerate Explore

Total Funding - 12,000

Portion of Funding Received - 12,000

Funding Competitive?: Yes

2020/9 - 2022/3
Principal Investigator Development of Conversational Agents and Applications in Playful Environments, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
MITACS Accelerate Assessment

Total Funding - 43,250

Portion of Funding Received - 43,250

Funding Competitive?: Yes

2020/4 - 2022/3
Principal Investigator Machine Learning and Data Mining for Smart Buildings, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate

Total Funding - 186,666

Portion of Funding Received - 186,666

Funding Competitive?: Yes

2021/4 - 2022/3
Principal Investigator Artificial Intelligence Infrastructure for Large Scale Multimodal Data Modeling, Grant

Funding Sources:

Concordia University
 Concordia Facility Optimization Program
 Total Funding - 30,000
 Portion of Funding Received - 30,000
 Funding Competitive?: Yes

2021/1 - 2021/12
 Principal Investigator

Tagging Audio Files, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 30,000
 Portion of Funding Received - 30,000
 Funding Competitive?: Yes

2020/8 - 2021/6
 Co-investigator

Development of an innovative smartphone application based on the new Canada's food guide, Grant

Funding Sources:

Concordia University
 PERFORM centre Call for Multidisciplinary Research Proposals in Preventive Health
 Total Funding - 30,000
 Portion of Funding Received - 10,000
 Funding Competitive?: Yes

Principal Investigator : Tamara Cohen

2019/4 - 2021/5
 Principal Investigator

Machine Learning and Data Mining Approaches for Smart Buildings, Grant

Funding Sources:

Concordia University
 Concordia Seed Funding
 Total Funding - 7,000
 Portion of Funding Received - 7,000
 Funding Competitive?: Yes

2019/10 - 2021/5
 Co-applicant

Development of an NLP Sales Assistant using Machine Learning Techniques, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 105,000
 Portion of Funding Received - 105,000
 Funding Competitive?: Yes

2020/1 - 2021/5
 Principal Investigator

Energy reduction in HVAC Systems in a Commercial Building Environment using Data-Driven Approaches, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 240,000
 Portion of Funding Received - 240,000
 Funding Competitive?: Yes

2020/9 - 2021/3
 Co-applicant

A web-based dyadic intervention to promote health eating and physical activity among obese older adults couples, Grant

Funding Sources:

Concordia University
 PERFORM centre Call for Multidisciplinary Research Proposals in Preventive Health

Total Funding - 30,000
 Portion of Funding Received - 10,000
 Funding Competitive?: Yes

Principal Investigator : Jean-Philippe Gouin

2020/9 - 2021/3
 Co-applicant

Multimedia and Artificial Intelligence Platform for Counteracting the Extreme Isolation
 Caused by Pandemic Confinement, Grant

Funding Sources:

Canada Foundation for Innovation (CFI)
 Exceptional Opportunities Fund – COVID-19 (Universities)
 Total Funding - 395,136
 Portion of Funding Received - 1
 Funding Competitive?: Yes

Co-investigator : Hidalgo Santiago;

Collaborator : Marta Kresten-Oertel; Najmeh Khalil-Mahani;

Principal Investigator : Ana Inés Ansaldo

2019/3 - 2019/11
 Principal Investigator

Offline Virtual Advertisement Replacement in Sports from Uncalibrated Video, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
 Engage
 Total Funding - 25,000
 Portion of Funding Received - 25,000
 Funding Competitive?: Yes

2019/4 - 2019/9
 Principal Investigator

NLP Sales Assistant, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 15,000
 Portion of Funding Received - 15,000
 Funding Competitive?: Yes

2014/6 - 2019/5
 Principal Investigator

Concordia research Chair Tier 2 (CURC) in Management, Analysis and Modeling of Big
 Multimodal Data and Applications, Research Chair

Funding Sources:

Concordia University
 Concordia research Chair Tier 2 (CURC)
 Total Funding - 100,000
 Portion of Funding Received - 100,000
 Funding Competitive?: Yes

2018/4 - 2018/9
 Principal Investigator

Topology validation, Error detection, and Correction of rooftops 3D models from LiDAR
 point clouds and Photogrammetry, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 15,000
 Portion of Funding Received - 15,000
 Funding Competitive?: Yes

2012/5 - 2017/4
 Principal Investigator

Hybrid generative discriminative learning of dynamic multi-relational models and
 applications, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery Grants - Individual

Total Funding - 140,000

Portion of Funding Received - 140,000

Funding Competitive?: Yes

Student/Postdoctoral Supervision**Bachelor's [n=11]**

- 2023/5 - 2023/8
Principal Supervisor Hamdi Barkous (Completed) , Ecole Polytechnique, Tunisia
Thesis/Project Title: Time series forecasting **Mitacs Globalink (research internship from May 2023 to August 2023)**
Present Position: Undergrad Student
- 2023/5 - 2023/8
Principal Supervisor Prince Raj (Completed) , Indian Institute of Technology, Kharagpur
Thesis/Project Title: Deep Topic Models for Textual and Visual **Mitacs Globalink (research internship from May 2023 to August 2023)**
Present Position: Undergraduate student
- 2023/5 - 2023/8
Principal Supervisor Umang Bagadi (Completed) , G.H. Rasoni College of Engineering(GHRCE), Nagpur
Thesis/Project Title: Natural Language Processing for Sentiment Analysis **Mitacs Globalink (research internship from May 2023 to August 2023)**
Present Position: Undergraduate student
- 2023/5 - 2023/8
Principal Supervisor Aleksander Vinokhodov (Completed) , Concordia University
Thesis/Project Title: Time Series Forecasting for Anomaly Detection **NSERC USRA (research internship from May 2023 to August 2023)**
Present Position: Undergraduate student
- 2021/5 - 2021/8
Principal Supervisor Wassim Nijaoui (Completed) , Concordia University
Thesis/Project Title: Semantic segmentation of videos, **NSERC USRA (research internship from May 2020 to August 2020)**
Present Position: Undergrad Student, Concordia University
- 2021/5 - 2021/8
Principal Supervisor Pragya Gupta (Completed) , National Institute of Technology, Trichy, India
Thesis/Project Title: NLP for Sentiment analysis, **Mitacs Globalink (research internship from May 2021 to August 2021)**
Present Position: Unknown
- 2021/3 - 2021/9
Principal Supervisor Jawher Dridi (Completed) , Ecole Polytechnique, Tunisia
Thesis/Project Title: Transfer learning for activity recognition in smart buildings, **Mitacs Globalink (research internship from March 2021 to July 2021)**
Present Position: Undergrad Student
- 2021/2 - 2021/6
Principal Supervisor Nouha Meftah (Completed) , ENIT, Tunisia
Thesis/Project Title: Emotion Recognition in Social Media (research internship from May 2021 to August 2021)
Present Position: Unknown
- 2019/8 - 2019/5
Principal Supervisor Xiawei Li (Completed) , Sichuan University, China
Thesis/Project Title: Statistical Framework for Color Constancy, **Mitacs Globalink (research internship from May 2020 to August 2020)**
Present Position: Unknown

2019/5 - 2019/8 Principal Supervisor	V. Vishnu (Completed) , National Institute of Technology, Trichy, India Thesis/Project Title: Variational Learning of Hidden Markov Models for Video Anomaly Detection, Mitacs Globalink (research internship from May 2020 to August 2020) Present Position: Unknown
2019/5 - 2019/8 Principal Supervisor	Tiphaine Besnard (Completed) , Universite de Nante, France Thesis/Project Title: Dynamic Texture Modeling (research internship from December 2019 to April 2020) Present Position: Master's student, Université de Nante
Master's non-Thesis [n=10]	
2023/1 - 2023/8 Principal Supervisor	Mohamed Bouzid (Completed) , Concordia University Thesis/Project Title: Load Forecasting using deep learning Present Position: Master's student
2023/1 - 2023/8 Principal Supervisor	Mina Amirpour (Completed) , Concordia University Thesis/Project Title: Cloud-Based Monitoring and Alerting IoT System Present Position: M.Eng Student, Concordia University
2022/5 - 2023/4 Principal Supervisor	Kumar Prabhakaran Saravanakumar (Completed) , Concordia University Thesis/Project Title: Explainable Machine Learning Present Position: Master's student, Concordia University
2022/1 - 2022/6 Principal Supervisor	Kian Ketabchi (Completed) , Concordia University Thesis/Project Title: Bayesian learning of Libby-Novick Beta Models and Feature Selection (research internship from January 2022 to June 2022) Present Position: PhD student, Concordia University
2020/8 - 2021/5 Principal Supervisor	Shahrzad Aminranjbar (Completed) , Concordia University Thesis/Project Title: Facial Expression Recognition using MCMC-Based learning of Finite Exponential Multinomial Scaled Dirichlet Models (research internship from January 2020 to May 2020) Present Position: Data Scientist, Inmind Technologies inc.
2019/1 - 2019/6 Principal Supervisor	Maryam Rahmanpour (Completed) , Concordia University Thesis/Project Title: Variational Entropy-Based Learning of Statistical Models Present Position: PhD student, Georgia Institute of Technology
2019/1 - 2019/4 Principal Supervisor	Maryam Rasti (Completed) , Concordia University Thesis/Project Title: MCMC-Based Learning of Finite Bivariate Mixture Models (research internship from January 2019 to May 2019) Present Position: Data Scientist, Tecsys Inc.
2018/1 - 2018/4 Principal Supervisor	Daria Chernova (Completed) , Concordia University Thesis/Project Title: Control charts for proportional Data (research internship from January 2019 to May 2019) Present Position: QA Analyst Pro Ingredients Inc.
2017/5 - 2017/8 Principal Supervisor	Kawtar Elbekkouri (Completed) , Concordia University Thesis/Project Title: Probabilistic Modeling of Web services (research internship from May 2017 to August 2017) Present Position: Regional Quality Manager- Americas FIME
2017/5 - 2017/8 Principal Supervisor	Yexing Li (Completed) , Concordia University Thesis/Project Title: Crime scene reconstruction (research internship from May 2017 to August 2017) Present Position: Data scientist Alibaba, China

Master's Thesis [n=57]

2022/5 - 2024/4 Principal Supervisor	Oumaima Jouiri (In Progress) , Concordia University Student Degree Expected Date: 2022/4 Thesis/Project Title: Energy consumption and price forecasting Present Position: Master's student
2022/1 - 2023/12 Principal Supervisor	Ahmed Yasser Eita (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Explainable Topic Models Present Position: Master's student
2022/1 - 2023/12 Principal Supervisor	Niloufar Samie (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Libby-Novick Beta Models Present Position: Master's student, Concordia University
2022/1 - 2023/8 Principal Supervisor	Jawher Dridi (Completed) , Concordia University Thesis/Project Title: Unsupervised Domain Adaptation for Estimating Occupancy and recognizing Activities in Smart Buildings Present Position: Research Assistant, Concordia University
2021/9 - 2023/12 Principal Supervisor	Farnaz Kashfinishabouri (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Recommendation Systems Present Position: Master's student, Concordia University
2021/9 - 2023/12 Principal Supervisor	Sahar Salmanzade (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Natural Language Processing Based on Deep Topic Models Present Position: Master's student
2021/9 - 2023/12 Principal Supervisor	Zheng Wang (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Topic models learning using expectation propagation Present Position: Master student
2021/9 - 2023/12 Principal Supervisor	Pardis Ghazi Amin (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Machine learning for Objects Detection Present Position: Master's student, Concordia University
2021/9 - 2024/4 Principal Supervisor	Shadan Ghadimi (In Progress) , Concordia University Student Degree Expected Date: 2024/4 Thesis/Project Title: Explainable Latent Topic Models Present Position: Master's student, Concordia University
2021/9 - 2023/5 Principal Supervisor	Hela Jemaa (Completed) , Concordia University Thesis/Project Title: Orchard Apple Tree Health Assessment using UAV-Based Computer Vision System Present Position: Master's student, Concordia University
2021/9 - 2023/12 Principal Supervisor	Zahra Golpa (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Explainable Machine Learning Present Position: Master's student
2021/9 - 2023/6 Principal Supervisor	Darya Forouzanfar (Completed) , Concordia University Thesis/Project Title: Unsupervised Learning with Feature Selection Based on Multivariate McDonald's Beta Mixture Model for Medical Data Analysis Present Position: Buisness Intelligence Consultant Nectari Software Inc.

2021/9 - 2023/5 Principal Supervisor	Mohammad Kaosain Akbar (Completed) , Concordia University Thesis/Project Title: Non-Intrusive Load Monitoring Using Machine and Deep Learning Methods Present Position: PhD student, Concordia University
2021/1 - 2023/12 Principal Supervisor	Oussama Sghaier (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Anomaly Detection Present Position: Master's student
2021/1 - 2022/12 Principal Supervisor	Fatemeh Rezapour Nikroo (Completed) , Concordia University Thesis/Project Title: Recursive Parameter Estimation of Non-Gaussian Hidden Markov Models for Occupancy Estimation in Smart Buildings Present Position: Machine learning engineer, Synechron Montreal
2021/1 - 2022/12 Co-Supervisor	Sneha Paul (Completed) , Concordia University Thesis/Project Title: An Efficient Neural Network Architecture and Training Protocol for 3D Point Cloud Classification Present Position: PhD student, Concordia University
2021/1 - 2022/12 Principal Supervisor	Zahra Motajabi (Completed) , Concordia University Thesis/Project Title: Deep Learning Methods for Codecs Present Position: Computer Vision Research, AVID Inc., Montreal
2021/1 - 2022/7 Principal Supervisor	Omar Bouhamed (Completed) , Concordia University Thesis/Project Title: AI-Powered Time Series Forecasting Frameworks for Building Energy Management Systems Present Position: Data scientist, Buspass Inc. Montreal
2020/9 - 2022/10 Principal Supervisor	Majid Nikougoftar Nategh (Completed) , Concordia University Thesis/Project Title: Automatic Counting of Mounds on UAV Images using Computer Vision and Machine Learning Present Position: Unknown
2020/9 - 2022/5 Principal Supervisor	Hannah Wood (Completed) , Concordia University Thesis/Project Title: Bidirectional LSTM and Kalman Filter for Passenger Flow Prediction on Bus Transportation Systems Present Position: Cloud Security Engineer, Microsoft
2020/9 - 2023/4 Principal Supervisor	Ahmed Rebei (Completed) , Concordia University Thesis/Project Title: Investigating Hybrid Methods and Transfer Learning for Accurate Load Forecasting Present Position: Data scientist, Unrbanoïd Inc.
2020/9 - 2022/7 Principal Supervisor	Zhiwen Luo (Completed) , Concordia University Thesis/Project Title: Extensions to Cross-Collection Topic Models with Parallel Inference and Differential Privacy using Flexible Priors Present Position: PhD student, Concordia University
2020/9 - 2022/1 Principal Supervisor	Ali Baghdadi (Completed) , Concordia University Thesis/Project Title: Variational Learning Frameworks for Generative Models Based on Hierarchical Dirichlet and Pitman-Yor Processes Present Position: Data Scientist, Buspass Inc. Montreal
2020/9 - 2023/3 Principal Supervisor	Ons Bouarada (Completed) , Concordia University Thesis/Project Title: Generative Models Based on the Bounded Asymmetric Student's t-Distribution Present Position: Data Scientist, Bell Canada

- 2020/8 - 2022/12
Principal Supervisor Xuanbo Su (Completed) , Concordia University
Thesis/Project Title: Fully Bayesian Inference for Finite and Infinite Discrete Exponential Mixture Models
Present Position: Computer vision researcher, Bilibili Inc., China
- 2020/2 - 2021/10
Principal Supervisor Soudabeh Tabarsaii (Completed) , Concordia University
Thesis/Project Title: Non-Intrusive Load Monitoring Using Additive Time Series Modeling via Finite Mixture Models Aggregation
Present Position: Data Scientist, AISTORM Inc. Toronto Canada
- 2020/1 - 2021/8
Principal Supervisor Bingwei Ge (Completed) , Concordia University
Thesis/Project Title: Statistical Framework Based on the Weighted Generalized Gaussian Mixture Model: Application to Robust Point Clouds Registration and Single Target Tracking
Present Position: AI researcher, Shunkun Technology Inc. Beijing, China
- 2020/1 - 2022/4
Co-Supervisor Ghazaleh Torabi (Completed) , Concordia University
Thesis/Project Title: Productivity Monitoring of Construction Workers Based on Spatiotemporal Activity Recognition
Present Position: Computer Vision Engineer, Leav, Montreal
- 2020/1 - 2021/12
Principal Supervisor Samar Hannachi (Completed) , Concordia University
Thesis/Project Title: Statistical Models for Short Text Clustering
Present Position: PhD student, Tokyo University, Japan
- 2019/9 - 2021/8
Principal Supervisor Zixiang Xian (Completed) , Concordia University
Thesis/Project Title: Generative Models Based on the Bounded Asymmetric Gaussian Distribution
Present Position: Instructor, United International College, Hong Kong, China
- 2019/9 - 2021/12
Principal Supervisor Ravi Teja Vemuri (Completed) , Concordia University
Thesis/Project Title: Fully Bayesian Learning with Markov Chain Monte Carlo Techniques for Asymmetric Generalized Gaussian Mixture and Hidden Markov Models
Present Position: Unknown
- 2019/9 - 2022/6
Principal Supervisor Oumayma Dalhoumi (Completed) , Concordia University
Thesis/Project Title: Non Negative Matrix Factorization
Present Position: Data Scientist, Ericsson
- 2019/9 - 2020/12
Co-Supervisor Behnam Farsi Balouch (Completed) , Concordia University
Thesis/Project Title: On Short-Term Load Forecasting using Machine Learning Techniques
Present Position: CEO, Icanapply Inc.
- 2019/9 - 2021/12
Principal Supervisor Guo Jiaxun (Completed) , Concordia University
Thesis/Project Title: Occupancy Estimation and Activity Recognition in Smart Buildings using Mixture-Based Predictive Distributions
Present Position: PhD student, Concordia University
- 2019/9 - 2021/4
Principal Supervisor Mahsa Amirkhani (Completed) , Concordia University
Thesis/Project Title: Bayesian Learning Frameworks for Multivariate Beta Mixture Models
Present Position: Data scientist, Bell Montreal
- 2019/1 - 2021/12
Principal Supervisor Mark Haddad (Completed) , Concordia university
Thesis/Project Title: An Instance-Based Learning Statistical Framework for One-Shot and Few-Shot Human Action Recognition
Present Position: Quality Control, Pratt & Whitney

- 2019/1 - 2020/12
Principal Supervisor
Mohammad Sadegh Ahmadzadeh (Completed) , Concordia University
Thesis/Project Title: A Study on Entropy-Based Variational Learning for Mixture Models
Present Position: Data scientist, OVE DECORS
- 2019/1 - 2020/12
Principal Supervisor
Yogesh Pawar (Completed) , Concordia University
Thesis/Project Title: Machine learning for intrusion detection
Present Position: Research associate, Université de Montreal
- 2018/9 - 2020/3
Principal Supervisor
Xavier Sumba (Completed) , Concordia University
Thesis/Project Title: Approximate Bayesian Inference for Count Data Modeling
Present Position: Data Scientist, Heyday.ai
- 2018/9 - 2020/8
Principal Supervisor
Ornela Bregu (Completed) , Concordia University
Thesis/Project Title: Mixture-Based Clustering for High-Dimensional Count Data Using Minorization-Maximization Approaches
Present Position: PhD student, Concordia University
- 2018/9 - 2019/10
Principal Supervisor
Ziyang Song (Completed) , Concordia University
Thesis/Project Title: Nonparametric Bayesian Models Based on Asymmetric Gaussian Distributions
Present Position: PhD student, National University of Singapore
- 2018/9 - 2020/3
Principal Supervisor
Md. Hafizur Rahman (Completed) , Concordia University
Thesis/Project Title: Distributional Feature Mapping in Data Classification
Present Position: Data Scientist, Heyday.ai
- 2018/9 - 2020/7
Principal Supervisor
Srikanth Amudala (Completed) , Concordia University
Thesis/Project Title: Variational Techniques for Medical and Image Processing Applications using Generalized Gaussian Distribution
Present Position: Data Scientist, Teck Resources Limited
- 2018/9 - 2020/3
Principal Supervisor
Pantea Koochemseshkian (Completed) , Concordia University
Thesis/Project Title: Distribution-Based Regression for Count and Semi-Bounded Data
Present Position: PhD student, Concordia University
- 2018/9 - 2020/5
Principal Supervisor
Zainab Arjmandi (Completed) , Concordia University
Thesis/Project Title: Variational Learning for Finite Shifted-Scaled Dirichlet Mixture Model and its Applications
Present Position: Software engineer, Technologies Adaptive, Montreal
- 2018/9 - 2019/12
Principal Supervisor
Meeta Kalra (Completed) , Concordia University
Thesis/Project Title: Online variational learning for medical images processing
Present Position: Data Scientist, Data Performers
- 2018/9 - 2020/10
Principal Supervisor
Fahdah Al-alyan (Completed) , Concordia University
Thesis/Project Title: Statistical Approaches for Binary and Categorical Data Modeling
Present Position: Lecturer, Um-Alqura University, Saudi Arabia
- 2018/1 - 2019/8
Principal Supervisor
Masoud Daghyani (Completed) , Concordia University
Thesis/Project Title: Efficient Computation of Log-likelihood Function in Clustering Overdispersed Count Data
Present Position: Data Analyst, Empire CO ltd. Toronto
- 2018/1 - 2020/12
Principal Supervisor
Omar Graja (Completed) , Concordia University
Thesis/Project Title: Spatial and Temporal Predictions for Positive Vectors
Present Position: Data Scientist, Heyday.ai
- 2018/1 - 2019/4
Principal Supervisor
Narges Manouchehri (Completed) , Concordia University
Thesis/Project Title: Finite Bivariate and Multivariate Beta Mixture Models Learning and Applications
Present Position: PhD student, Concordia University

- 2017/9 - 2019/1
Principal Supervisor Jaspreet Singh Kalsi (Completed) , Concordia University
Thesis/Project Title: Color Image Segmentation by Integrating Spatial Information using Semi-Bounded Finite Mixture Models
Present Position: Data scientist, Sofdesk Inc.
- 2017/9 - 2019/2
Principal Supervisor Divya Ankam (Completed) , Concordia University
Thesis/Project Title: Distributions based Regression Techniques for Compositional Data
Present Position: AI/ML Technical solutions Engineer, Google
- 2017/9 - 2019/6
Principal Supervisor Hieu Nguyen (Completed) , Concordia University
Thesis/Project Title: Variational Approaches for Learning Finite Scaled Dirichlet Mixture Models
Present Position: Data Scientist, The International Air Transport Association (IATA)
- 2017/9 - 2019/8
Principal Supervisor Kamal Maanicshah (Completed) , Concordia University
Thesis/Project Title: A Study on Variational Component Splitting Approach for Mixture Models
Present Position: PhD student, Concordia University
- 2017/1 - 2018/8
Principal Supervisor Rua Suroji (Completed) , Concordia University
Thesis/Project Title: Multidimensional Proportional Data Clustering using Shifted-Scaled Dirichlet Model
Present Position: Lecturer, Um-Alqura University, Saudi Arabia
- 2016/5 - 2018/5
Principal Supervisor Shuai Fu (Completed) , Concordia University
Thesis/Project Title: Bayesian Learning of Asymmetric Gaussian-Based Statistical Models Using Markov Chain Monte Carlo Techniques
Present Position: Senior Software Engineer, Shape Security Silicon Valley, USA
- 2016/1 - 2017/12
Principal Supervisor Jaipuneet Singh (Completed) , Concordia University
Thesis/Project Title: Proportional Data Modeling Using Unsupervised Learning and Applications
Present Position: Data scientist, Douglas Mental Health University Institute
- Doctorate [n=22]**
- 2022/1 - 2025/12
Co-Supervisor Siavash Farazmand (In Progress) , Concordia University
Thesis/Project Title: Graph Neural Networks for Transportation
Present Position: PhD student, Concordia University
- 2022/1 - 2025/12
Principal Supervisor Akinlolu Oluwabusayo Ojo (In Progress) , Concordia University
Student Degree Expected Date: 2025/12
Thesis/Project Title: Interactive machine learning
Present Position: PhD student, Concordia University
- 2022/1 - 2025/12
Principal Supervisor Jiaxun Guo (In Progress) , Concordia University
Student Degree Expected Date: 2025/12
Thesis/Project Title: Deep mixture models
Present Position: PhD student, Concordia University
- 2021/9 - 2024/12
Principal Supervisor Ornela Bregu (In Progress) , Concordia University
Thesis/Project Title: Topic Modeling Based on Flexible Distributions
Present Position: PhD student, Concordia University
- 2021/9 - 2024/12
Principal Supervisor Ahmed Zgaren (In Progress) , Concordia University
Thesis/Project Title: Machine Learning for UAV imagery
Present Position: PhD student, Concordia University

2021/9 - 2024/12 Principal Supervisor	Alaa Nfissi (In Progress) , Concordia University Thesis/Project Title: Audio Processing using Explainable Deep Learning Present Position: PhD student, Concordia University
2021/1 - 2024/4 Co-Supervisor	Asiye Baghbani (In Progress) , Concordia University Student Degree Expected Date: 2024/4 Thesis/Project Title: Load forecasting in Micro Transit Demand Management Present Position: PhD student, Concordia University
2020/9 - 2023/12 Principal Supervisor	Viet Tra (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Machine Learning for Energy and Buildings Present Position: PhD student, Concordia University
2020/9 - 2023/8 Principal Supervisor	Ali Algumaei (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Conversational agents using AI Present Position: PhD student, Concordia University
2020/9 - 2024/12 Principal Supervisor	Pantea Koochemseshkian (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: Time series analysis Present Position: PhD student, Concordia University
2020/1 - 2023/8 Co-Supervisor	Soroush Samareh Abolhassani (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: AI for Smart Buildings Present Position: PhD student, Concordia University
2019/9 - 2023/3 Principal Supervisor	Kamal Maanicshah (Completed) , Concordia University Thesis/Project Title: Novel Mixture Allocation Models for Topic Learning Present Position: Data Scientist, Buspas Inc.
2019/9 - 2023/8 Principal Supervisor	Hafsa Ennajari (Completed) , Concordia University Thesis/Project Title: Embedded Spherical Probabilistic Modeling for Topic Discovery and Text Representation Learning in Unstructured Text Data Present Position: PhD student, Concordia University
2019/6 - 2022/10 Principal Supervisor	Fatma Najar (Completed) , Concordia University Thesis/Project Title: Smoothed Probabilistic Algorithms for Sparse Data with Application to Emotion Recognition and Sentiment Analysis Present Position: Assistant Professor, City University of New York, USA
2019/5 - 2022/6 Principal Supervisor	Narges Manouchehri (Completed) , Concordia University Thesis/Project Title: Generative Learning Models and Applications in Healthcare Present Position: Postdoc, NSERC Postdoctoral Fellowship, Karolinska institute, Sweden
2019/1 - 2023/5 Principal Supervisor	Hussein Al-Bazzaz (Completed) , Concordia University Thesis/Project Title: Mixture-Based Clustering and Hidden Markov Models for Energy Management and Human Activity Recognition: Novel Approaches and Explainable Applications Present Position: Unknown
2018/9 - 2022/5 Principal Supervisor	Rim Nasfi (Completed) , Concordia University Thesis/Project Title: Modeling Semi-Bounded Support Data using Non-Gaussian Hidden Markov Models with Applications Present Position: Data Scientist, Deloitte

- 2018/5 - 2021/8
Principal Supervisor
Vahid Khorasani Ghassab (Completed) , Concordia University
Thesis/Project Title: Multi-Frame Reconstruction Using Super-Resolution, Inpainting, Segmentation and Codecs
Present Position: Data Scientist, IPTOKI Inc., Montreal
- 2018/1 - 2021/4
Principal Supervisor
Samr Ali (Completed) , Concordia University
Thesis/Project Title: Hidden Markov Models and their Extensions for Proportional Sequential Data
Present Position: Data scientist, Ericsson
- 2016/1 - 2020/1
Principal Supervisor
Nuha Zamzami (Completed) , Concordia University
Thesis/Project Title: High-Dimensional Sparse Count Data Clustering using Finite Mixture Models
Present Position: Assistant Professor, King Abdulaziz University, KSA
- 2015/9 - 2020/12
Principal Supervisor
Koffi Eddy Ihou (Completed) , Concordia University
Thesis/Project Title: Extensions to the Latent Dirichlet Allocation Topic Model using Flexible Priors
Present Position: Data Scientist, Zetane Systems Inc.
- 2012/9 - 2017/8
Principal Supervisor
Muhammad Azam (Completed) , Concordia University
Thesis/Project Title: Bounded Support Finite Mixture Models for Multidimensional Data Modeling and Clustering
Present Position: Research Scientist, Brainbox

Post-doctorate [n=7]

- 2023/1 - 2024/12
Co-Supervisor
Shahin Masoumi (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Deep learning for Energy Applications
Present Position: Post-doctorate, Concordia University
- 2023/1 - 2024/12
Co-Supervisor
Mehdi Meshknai (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Machine learning for Intelligent Transportation
Present Position: Post-doctorate, Concordia University
- 2022/10 - 2023/2
Co-Supervisor
Fereshteh Samadi Mollayousefi (Completed) , Concordia University
Thesis/Project Title: Intelligent transportation
Present Position: Postdoctoral fellow, ETS, Montreal
- 2021/8 - 2022/1
Principal Supervisor
Vahid Khorasani Ghassab (Completed) , Concordia University
Thesis/Project Title: Development of a Solution to Assess the Quality and to Optimize AI-Based Video Codecs
Present Position: Data Scientist, IPTOKI Inc., Montreal
- 2021/1 - 2021/12
Principal Supervisor
Koffi Eddy Ihou (Completed) , Concordia University
Thesis/Project Title: Machine learning for Micro Transit Demand Management
Present Position: Data Scientist, Zetane Systems Inc.
- 2020/7 - 2021/10
Principal Supervisor
Muhammad Azam (Completed) , Concordia University
Thesis/Project Title: Machine learning for Micro Transit Demand Management
Present Position: Principal Data Scientist, Brainbox Inc.
- 2020/1 - 2020/12
Principal Supervisor
Manar Amayri (Completed) , Concordia University
Thesis/Project Title: Machine learning for Smart Buildings
Present Position: Assistant Professor, Grenoble Institute of Technology, France

Editorial Activities

2023/1 - 2024/12	Associate Editor, IEEE Transactions on Neural Networks and Learning Systems, Journal
2022/1 - 2024/12	Associate editor, Engineering Applications of Artificial Intelligence, Journal
2021/1 - 2024/12	Associate editor, Journal of imaging, Journal
2021/1 - 2024/12	Associate editor, Sensors, Journal
2012/9 - 2024/12	Associate editor, Pattern Recognition, Journal
2013/9 - 2018/8	Associate editor, ISRN Signal Processing, Journal
2013/8 - 2018/7	Associate editor, International Journal of Rough Sets and Data Analysis, Journal
2012/12 - 2017/11	Associate editor, Journal of Engineering, Journal
2012/6 - 2017/5	Associate editor, The Scientific World Journal, Journal

Organizational Review Activities

2023/5 - 2023/7	External hiring committee member, Télé-université External member of TELUQ hiring committee
2016/9 - 2022/10	Referee, Natural Sciences and Engineering Research Council of Canada (NSERC) Referee for many research proposals, research chairs, Gerhard Herzberg Canada Gold Medal for Science and Engineering, etc.
2022/6 - 2022/8	Referee for funding proposals, Italian Science Fund Evaluating funding proposals
2022/5 - 2022/6	Referee for promotion, Télé-université Referee to promotion to Full professor
2019/1 - 2021/12	Referee, AI projects, Prompt Quebec Evaluation Committee of AI projects
2021/1 - 2021/3	Referee to promotion, King Abdulaziz University Referee to promotion to associate professor, King Abdullah University of Science and Technology (KAUST)
2019/1 - 2019/6	Referee for funding proposals, UK Engineering and Physical Sciences Research Council Referee for funding proposals for EPSRC.
2019/4 - 2019/5	Referee to promotion, Liverpool John Moores University Referee for promotion to Reader
2018/11 - 2018/12	Referee for promotion, American University, Beirut Referee for promotion to associate professor
2018/10 - 2018/11	Referee for promotion, Asian Institute of Technology Referee for promotion to full professor
2018/6 - 2018/9	Referee for funding proposals, National Science Center, Poland Referee for funding proposals

International Collaboration Activities

2021/1 - 2022/12	Research Collaborator, China Explainable machine learning techniques
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2020/11 - 2022/12 Research Collaborator, France
 Collaboration on using advanced machine learning techniques for smart buildings applications

Committee Memberships

2022/12 Committee Member, Technical program committee, Workshop on AI-Driven Smart Healthcare, with IEEE Global Communications Conference, IEEE

2022/10 Committee Member, Technical program committee, International Conference on Advanced Data Mining and Applications (ADMA), Springer

2022/9 Committee Member, Technical program committee, International Conference on Knowledge Discovery and Information Retrieval (KDIR), IEEE

2022/9 Committee Member, Technical program committee, IEEE International Conference on Artificial Intelligence for Industries (AI4I), IEEE

2022/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE

2022/5 Committee Member, Technical program committee, International Flairs conference, The Florida Artificial Intelligence Research Society

2022/5 Committee Member, Technical program committee, Canadian Conference on Artificial Intelligence, Canadian Artificial Intelligence Association

2021/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE

2021/12 Committee Member, Technical program committee, International Symposium on Visual Computing, IAPR

2021/9 Committee Member, Technical program committee, IEEE International Conference on Artificial Intelligence for Industries, IEEE

2021/7 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association

2021/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE

2021/5 Committee Member, Technical program committee, The International Flairs conference, The Florida Artificial Intelligence Research Society

2021/5 Committee Member, Technical program committee, Canadian Conference on Artificial Intelligence, Canadian Artificial Intelligence Association

2021/2 Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication

2020/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE

2020/12 Committee Member, Technical program committee, International Symposium on Visual Computing, IAPR

2020/12 Committee Member, Technical program committee, Workshop on AI-Driven Smart Healthcare, with IEEE Global Communications Conference, IEEE

- 2020/10 Committee Member, Technical program committee, The 1st International Conference on Cognitive Analytics, Granular Computing, and Three-Way Decisions, Belief Functions and Applications Society
- 2020/9 Committee Member, Technical program committee, IEEE International Conference on Artificial Intelligence for Industries, IEEE
- 2020/9 Committee Member, Technical program committee, International Conference on Web Services, The Services Society (S2)
- 2020/8 Committee Member, Technical program committee, The second International Conference on Deep Learning, Big Data and Blockchain, IEEE
- 2020/8 Committee Member, Technical program committee, The International Conference on Deep Learning and Machine Learning in Emerging Applications, IEEE
- 2020/8 Committee Member, Technical program committee, International Conference on Web Services, The Services Society (S2)
- 2020/6 Committee Member, Technical program committee, 23rd International Conference on Business Information Systems, BIS
- 2020/6 Committee Member, Technical program committee, International Conference on Control, Decision and Information Technologies, IEEE
- 2020/6 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
- 2020/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
- 2020/5 Committee Member, Technical program committee, Canadian Conference on Artificial Intelligence, Canadian Artificial Intelligence Association
- 2020/5 Committee Member, Technical program committee, The International Flairs conference, The Florida Artificial Intelligence Research Society
- 2020/2 Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication
- 2019/12 Committee Member, Technical program committee, International Conference on Brain Informatics, CAAI Technical Committee on Brain Science and Artificial Intelligence
- 2019/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE
- 2019/9 Committee Member, Technical program committee, IEEE International Conference on Artificial Intelligence for Industries, IEEE
- 2019/7 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
- 2019/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
- 2019/5 Committee Member, Technical program committee, Canadian Conference on Artificial Intelligence, Canadian Artificial Intelligence Association
- 2019/4 Committee Member, Technical program committee, International Conference on Control, Decision and Information Technologies, IEEE

- 2019/2 Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication
- 2018/12 Committee Member, Technical program committee, International Conference on Brain Informatics, CAAI Technical Committee on Brain Science and Artificial Intelligence
- 2018/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE
- 2018/9 Committee Member, Technical program committee, IEEE International Conference on Artificial Intelligence for Industries, IEEE
- 2018/7 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
- 2018/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
- 2018/5 Committee Member, Technical program committee, Canadian Conference on Artificial Intelligence, Canadian Artificial Intelligence Association
- 2018/4 Committee Member, Technical program committee, International Conference on Control, Decision and Information Technologies, IEEE
- 2018/2 Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication
- 2017/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE
- 2017/7 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
- 2017/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
- 2017/3 Committee Member, Technical program committee, International Conference on Control, Decision and Information Technologies, IEEE
- 2017/2 Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication
- 2016/12 Chair, 9th International Conference Developments in eSystems Engineering (DeSE 2016), IEEE
- 2016/12 Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE
- 2016/7 Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
- 2016/6 Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
- 2016/3 Committee Member, Technical program committee, International Conference on Control, Decision and Information Technologies, IEEE

2016/3	Chair, The International Conference on Control, Decision and Information Technologies (CoDIT'2016), IEEE
2016/2	Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication
2015/12	Committee Member, Technical program committee, IEEE International Conference on Machine Learning and Applications (ICMLA), IEEE
2015/10	Committee Member, Technical program committee, IEEE International Conference on Tools with Artificial Intelligence (ICTAI),, IEEE
2015/7	Committee Member, Technical program committee, The Joint Rough Set Symposium (IJCRS), International Fuzzy Systems Association
2015/6	Committee Member, Technical program committee, IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS), In conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR), IEEE
2015/2	Committee Member, Technical program committee, International Conference on Pattern Recognition Applications and Methods, Institute for Systems and Technologies of Information, Control and Communication

Other Memberships

2008/6	Member, Professional Engineers ontario
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Broadcast Interviews

2010/07/20 - 2010/07/20	Computer Vision Research, RCI // POMME ET MANDARINE, Radio Canada International (RCI)
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Text Interviews

2021/03/05	Laying the foundation for building a sustainable and resilient city, The Globe and Mail
2020/02/10	Machine learning for smart buildings, leDevoir

Publications

Journal Articles

1. R. Gonsalves, Z. Montajabi*, S. Mahtur and N. Bouguila. (2023). Machine Learning Applied to Media Libraries for Insights, Serach, and Segmentation. SMPTE Motion Imaging Journal. 132(33): 27-38.
Published
Refereed?: Yes
2. A. Zgaren*, W. Bouachir, and N. Bouguila. (2023). Automatic Counting of Planting Microsites via Local Visual Detection and Global Counting Estimation. IEEE Transactions on Emerging Topics in Computational Intelligence.
In Press
Refereed?: Yes

3. S. Rahmani, A. Baghbani*, N. Bouguila and Z. Patterson. (2023). Graph Neural Networks for Intelligent Transportation Systems. IEEE Transactions on Intelligent Transportation Systems. 24(8): 8846-8885.
Published
Refereed?: Yes, Open Access?: Yes
4. J. Guo*, M. Amayri, W. Fan, and N. Bouguila. (2023). Liouville-Based Predictive Models for Occupancy Estimation using Small Training Data. IEEE Internet of Things Journal.
In Press
Refereed?: Yes
5. M. Osadebey*, M. Pedersen, M. Kalra*, D. Waaler and N. Bouguila. (2023). Enhancement of Clustering Techniques by Coupling Clustering Tree and Neural Network: Application to Brain Tumor Segmentation. Expert Systems – The Journal of Knowledge Engineering. 40(30): Article e13176.
Published
Refereed?: Yes
6. O. Dalhoumi*, N. Bouguila, M. Amayri and W. Fan. (2023). Bayesian Matrix Factorization for Semi-Bounded Data. IEEE Transactions on Neural Networks and Learning Systems. 34(6): 3111-3123.
Published
Refereed?: Yes
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1. Nizar Bouguila, Wentao Fan and Manar Amayri. (2022). *Hidden Markov Models and Applications*.
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1. S. Ali* and N. Bouguila. (2022). Hidden Markov Models: Discrete Feature Selection in Activity Recognition. N. Bouguila, W. Fan and M. Amayri. Hidden Markov Models and Applications. : 103-155.
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Conference Publications

1. K. Maanicshah*, N. Manouchehri*, M. Amayri and N. Bouguila. (2023). Novel Topic Models for Parallel Extraction from Multilingual Text. *Lecture Notes in Computer Sciences 13996. 15th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2023)*, (297-309)
Paper
Published
Refereed?: Yes, Invited?: No
2. A. Y. Eita, H. Ennajari*, and N. Bouguila. (2023). 3D Multi-Views Object Classification Based on a Fully Generalized Dirichlet Allocation Model. *24th IEEE International Conference on Industrial Technology (IEEE ICIT 2023)*,
Paper
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Refereed?: Yes, Invited?: No
3. H. Al-Bazzaz*, M. Azam, M. Amayri and N. Bouguila. (2023). Enhancing Human Action Recognition with Asymmetric Generalized Gaussian Mixture Mixture-based Hidden Markov Models and Bounded Support. *IEEE Conference on Systems, Man, and Cybernetics (SMC 2023)*,
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4. D. Forouzanfar*, N. Manouchehri*, and N. Bouguila. (2023). Bayesian Inference in Infinite Multivariate McDonald's Beta Mixture Model. *22nd International Conference on Artificial Intelligence and Soft Computing (ICAISC 2023)*,
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5. O. Bregu*, N. Zamzami*, and N. Bouguila. (2023). Human Age Prediction Based on Brain MRI Using Density-Based Regression. 24th IEEE International Conference on Industrial Technology (IEEE ICIT 2023), Paper
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Refereed?: Yes, Invited?: No
6. A. Baghbani*, S. Rahmani, N. Bouguila, and Z. Patterson. (2023). Predicting Passenger Flow using Graph Neural Networks with Scheduled Sampling on Bus Networks. IEEE 26th International Conference on Intelligent Transportation Systems (ITSC 2023), Paper
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7. D. Forouzanfar*, N. Manouchehri*, and N. Bouguila. (2023). Finite Multivariate McDonald's Beta Mixture Model Learning Approach in Medical Applications. 38th ACM/SIGAPP Symposium on Applied Computing (SAC2023), (1143-1150)
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8. D. Forouzanfar*, N. Manouchehri*, and N. Bouguila. (2023). A Fully Bayesian Inference Approach for Multivariate McDonald's Beta Mixture Model with Feature Selection. 9th International Conference on Control, Decision and Information Technologies (CODIT 2023), Paper
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9. N. Samiee*, N. Manouchehri*, and N. Bouguila. (2023). Finite Libby-Novick Beta Mixture Model: An MML-Based Approach. Lecture Notes in Computer Sciences 13995. 15th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2023), (371-383)
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10. Z. Golpayegani*, P. St-Amant and N. Bouguila. (2023). Clarifying Myths About the Relationship Between Shape Bias, Accuracy, and Robustness. 20th Conference on Robots and Vision (CRV 2023), (281-287)
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11. H. Jemaa*, W. Bouachir, B. Leblon, A. LaRocque, A. Haddadi and N. Bouguila. (2023). Tree Health Assessment from UAV Images using Hard Negative Mining and Semi-Supervised Autoencoder. 20th Conference on Robots and Vision (CRV 2023), (312-319)
Paper
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Refereed?: Yes, Invited?: No
12. Z. Montajabi*, V. K. Ghassab*, and N. Bouguila. (2023). Invertible Neural Network-Based Video Compression. 12th International Conference on Pattern Recognition Applications and Methods (ICPRAM 2023), (558-564)
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13. H. Al-Bazzaz*, M. Azam, M. Amayri and N. Bouguila. (2023). Enhanced Energy Characterization and Feature Selection using Explainable Nonparametric AGGMM. 15th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2023),
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14. Z. Luo*, M. Amayri, W. Fan and N. Bouguila. (2023). A Selective Supervised Latent Beta-Liouville Allocation for Document Classification. Lecture Notes in Computer Science 13925. 36th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2023), (37-48)
Paper
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15. M. Chaaben*, A. Baghbani*, N. Bouguila, and Z. Patterson. (2023). Multi-STGAC: A Graph Attention Based Model for Short-term Bus Passenger Flow Forecasting. IEEE 26th International Conference on Intelligent Transportation Systems (ITSC 2023),
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16. S. Farazmand*, Raghav Narula, Z. Patterson and N. Bouguila. (2023). A Variational Graph Convolution Network with Normalizing Flows for Passenger Flow Prediction. IEEE International Conference on Artificial Intelligence for Industries (AI4I),
Paper
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18. F. Rezapoor Nikroo*, M. Amayri and N. Bouguila. (2023). HMMs Recursive Parameter Estimation for Semi-Bounded Data Modeling: Application to Occupancy Estimation in Smart Buildings. 12th International Conference on Smart Cities and Green ICT Systems (SMARTGREENS 2023), (81-88)
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Refereed?: Yes, Invited?: No
19. K. Maanicshah*, M. Amayri and N. Bouguila. (2023). Novel Topic Models for Content Based Recommender Systems. 25th International Conference on Enterprise Information Systems (ICEIS 2023), (138-145)
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20. A. Zgaren*, W. Bouachir, N. Bouguila and R. Hammoud. (2023). MoundCount: A Visual Detection-Based Approach for Automatic Counting of Planting Microsites on UAV Images. 19th IEEE Workshop on Perception Beyond the Visible Spectrum (PBVS 2023), in conjunction with IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2023), (497-506)
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21. S. Paul*, Z. Patterson and N. Bouguila. (2023). CrossMoCo: Multi-Modal Momentum Contrastive Learning for Point Cloud. 20th Conference on Robots and Vision (CRV 2023), (273-280)
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22. H. Al-Bazzaz*, M. Azam, M. Amayri and N. Bouguila. (2023). Explainable Robust Smart Meter Data Clustering for Improved Energy Management. IEEE Conference on Systems, Man, and Cybernetics (SMC 2023),
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23. M. K. Akbar*, M. Amayri and N. Bouguila. (2023). Deep Learning Based Solution for Appliance Operational State Detection and Power Estimation in Non-Intrusive Load Monitoring. Lecture Notes in Computer Science 13926. 36th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2023), (59-65)
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24. N. Samiee, N. Manouchehri*, and N. Bouguila. (2023). Maximum Likelihood-Based Estimation of Finite Multivariate Libby-Novick Beta Mixture Models in Medical Applications. 24th IEEE International Conference on Industrial Technology (IEEE ICIT 2023),
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25. F. Najar* and N. Bouguila. (2023). Sentiment Analysis using Smoothed Probabilistic-Based Models. 9th International Conference on Control, Decision and Information Technologies (CODIT 2023),
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26. H. Al-Bazzaz*, K. Prabhakaran*, M. Azam, M. Amayri and N. Bouguila. (2023). Refining Nonparametric Mixture Models with Explainability for Smart Building Applications. IEEE Conference on Systems, Man, and Cybernetics (SMC 2023),
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27. V. K. Ghassab*, R. Gonsalves, S. Mathur, and N. Bouguila. (2022). Video Compression Using Convolutional Neural Networks of Video with Chroma Subsampling. SMPTE 2022 Media and Technology Summit,
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28. M. Dib, S. Torabi, E. Bou-Harb, N. Bouguila and C. Assi. (2022). EVOLIoT: A Self-Supervised Contrastive Learning Framework for Detecting and Characterizing Evolving IoT Malware Variants. 17th ACM ASIA Conference on Computer and Communications Security (ACM ASIACCS 2022), (452-466)
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30. S. Salmanzade*, F. Najar* and N. Bouguila. (2022). Bayesian Folding-In Using Generalized Dirichlet and Beta-Liouville Kernels for Information Retrieval. IEEE Symposium Series on Computational Intelligence (SSCI 2022), (1430-1435)
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31. M. N. Nategh*, A. Zgaren*, W. Bouachir, and N. Bouguila. (2022). Automatic Counting of Mounds on UAV Images: Combing Instance Segmentation and Patch-Level Correction. 21th IEEE International Conference on Machine Learning and Applications (ICMLA 2022), (375-381)
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33. N. Manouchehri*, A. Baghdadi* and N. Bouguila. (2022). A Hierarchical Pitman-Yor Mixture of Scaled Dirichlet Distributions. 31st IEEE International Symposium on Industrial Electronics (ISIE 2022, (168-173)
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34. Y. Pawar*, M. Amayri and N. Bouguila. (2022). An Accelerated Nonparametric Bayesian Approach for Anomaly Detection with Feature Selection. International Electrical Engineering Congress (IEECON2022),
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42. N. Manouchehri* and N. Bouguila. (2022). Integration of Multivariate Beta-Based Hidden Markov Models and Support Vector Machines with Medical Applications. 35th International FLAIRS Conference,
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45. K. Prabhakaran*, J. Dridi*, M. Amayri and N. Bouguila. (2022). Explainable K-Means Clustering for Occupancy Estimation. 12th International Conference on Sustainable Energy Information Technology (SEIT), (326-333)
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48. W. Fan, M. Amayri and N. Bouguila. (2022). Stochastic Expectation Propagation Learning for Unsupervised Feature Selection. 14th International Conference on Computational Collective Intelligence (ICCCI 2022), (674-686)
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51. N. Manouchehri* and N. Bouguila. (2022). Multivariate Beta Dirichlet Process-Based Hidden Markov Models Applied to Medical Applications. 23rd IEEE International Conference on Industrial Technology (IEEE ICIT 2022),
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52. J. Guo*, M. Amayri, W. Fan and N. Bouguila. (2022). A Generalized Inverted Dirichlet Predictive Model for Activity Recognition using Small Data. Lecture Notes in Computer Science 13343. Proc. of the 35th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/ AIE 2022), (431-442)
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53. A. Nfissi*, W. Bouachir, N. Bouguila, and B. L. Mishara. (2022). CNN-n-GRU: End-to-End Speech Emotion Recognition from Raw Waveform Signal using CNNs and Gated Recurrent Unit Networks. IEEE International Conference on Machine Learning and Applications (ICMLA 2022), (699-702)
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58. H. Jemaa*, W. Bouachir, B. Leblon and N. Bouguila. (2022). Computer Vision System for Detecting Orchards Trees from UAV Image. XXIVth International Society for Photogrammetry and Remote Sensing (ISPRS) Congres, (661-668)
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59. N. Manouchehri*, N. Bouguila, and W. Fan. (2021). Batch and Online Variational learning of Hierarchical Pitman-Yor Mixtures of Multivariate Beta Distributions. IEEE. 20th IEEE International Conference on Machine Learning and Applications (ICMLA 2021), (298-303)
Conference Date: 2021/12
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Refereed?: Yes, Invited?: No
60. A. Rebei*, O. Dalhoumi*, N. Manouchehri*, A. Baghdadi*, M. Amayri and N. Bouguila. (2021). Variational Learning of the Mixture of Shifted-Scaled Dirichlet Distributions via Entropy Splitting. IEEE. International Symposium on Networks, Computers and Communications (ISNCC), (1-6)
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Refereed?: Yes, Invited?: No
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62. V. K. Ghassab* and N. Bouguila. (2021). Hyperspectral Video Super-Resolution using Beta Process and Bayesian Dictionary Learning. Lecture Notes in Computer Science, Vol. 13018, Springer. 16th International Symposium on Visual Computing (ISVC 2021), (251-262)
Conference Date: 2021/10
Paper
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Refereed?: Yes, Invited?: No
63. F. Najar* and N. Bouguila. (2021). Sparse Document Analysis using Beta-Liouville Naïve Bayes with Vocabulary Knowledge. Lecture Notes in Computer Science 12822, Springer. 16th International Conference on Document Analysis and recognition (ICDAR 2021), (351-363)
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Paper
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Refereed?: Yes, Invited?: No
64. Z. Xian*, M. Azam* and N. Bouguila. (2021). Statistical Modeling using Bounded Asymmetric Gaussian Mixtures: Application to Human Action and Gender Recognition. IEEE. 22nd IEEE International Conference on Information Reuse and Integration for Data Science (IRI 2021), (41-48)
Conference Date: 2021/8
Paper
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Refereed?: Yes, Invited?: No
65. Z. Xian*, M. Azam*, M. Amayri* and N. Bouguila. (2021). Model Selection Criterion for Multivariate Bounded Asymmetric Gaussian Mixture Model. IEEE. 29th European Conference on Signal Processing (EUSIPCO2021), (1436-1440)
Conference Date: 2021/8
Paper
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Refereed?: Yes, Invited?: No
66. N. Maouchehri*, A. Baghdadi* and N. Bouguila. (2021). A Hierarchical Nonparametric Bayesian Model Based on Scaled Dirichlet Distribution. IEEE. 22nd IEEE International Conference on Information Reuse and Integration for Data Science (IRI 2021), (61-68)
Conference Date: 2021/8
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Refereed?: Yes, Invited?: No
67. F. Najar* and N. Bouguila. (2021). Jointly Smoothing Word Embedding and Text Representation. IEEE. 22nd IEEE International Conference on Information Reuse and Integration for Data Science (IRI 2021), (282-289)
Conference Date: 2021/8
Paper
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Refereed?: Yes, Invited?: No
68. M. Amirkhani*, N. Maouchehri* and N. Bouguila. (2021). A Nonparametric Bayesian Framework for Multivariate Beta Mixture Models. IEEE. 22nd IEEE International Conference on Information Reuse and Integration for Data Science (IRI 2021), (83-90)
Conference Date: 2021/8
Paper
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Refereed?: Yes, Invited?: No

69. M. H. Rahman*, S. Ali* and N. Bouguila. (2021). Efficient Parameter Based Online object Tracking. IEEE. IEEE International Joint Conference on Neural Networks (IEEE IJCNN 2021), (1-8)
Conference Date: 2021/7
Paper
Published
Refereed?: Yes, Invited?: No
70. S. Hannachi*, F. Najar*. K. Ihou*, and N. Bouguila. (2021). Collapsed Gibbs Sampling of Beta-Liouville Multinomial for Short Text Clustering. Lecture Notes in Computer Science 12798, Springer. 34th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2021), (564-571)
Conference Date: 2021/7
Paper
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Refereed?: Yes, Invited?: No
71. W. Fan, Z. Guo, N. Bouguila, and W. Hou. (2021). Clustering-Based Online News Topic Detection and Tracking Through Hierarchical Bayesian Nonparametric Models. ACM. 44th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2021), (2126-2130)
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Paper
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Refereed?: Yes, Invited?: No
72. G. Torabi*, A. Hammad, and N. Bouguila. (2021). Joint Detection and Activity Recognition of Construction Workers using Convolutional Neural Networks. European Conference on Computing in Construction (2021 EC3), (212-219)
Conference Date: 2021/7
Paper
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Refereed?: Yes, Invited?: No
73. M. Amirkhani*, N. Manouchehri* and N. Bouguila. (2021). Birth-Death MCMC Approach for Multivariate Beta Mixture Models in Medical Applications. Lecture Notes in Computer Science 12798, Springer. 34th International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE 2021), (285-296)
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Paper
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Refereed?: Yes, Invited?: No
74. O. Graja*, F. Najar*, M. Amayri, and N. Bougu. (2021). Inverted Dirichlet State Space Model for Time Series Forecasting. IEEE. IEEE International Symposium on Industrial Electronics, (1-6)
Conference Date: 2021/6
Paper
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Refereed?: Yes, Invited?: No
75. N. Manouchehri*, O. Dalhoumi*, M. Amayri, and N. Bouguila. (2021). Online Variational Learning of Shifted Scaled Dirichlet Mixture. AAAI. IEEE International Symposium on Industrial Electronics (ISIE 2021),
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Refereed?: Yes, Invited?: No

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Conference Date: 2021/5
Paper
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Refereed?: Yes, Invited?: No
77. M. S. Ahmadzadeh*, N. Manouchehri*, H. Ennajari*, M. Amayri, N. Bouguila and W. Fan. (2021). Entropy-Based Variational Learning of Finite Inverted Beta-Liouville Mixture Models. AAAI. 34rd International Conference of the Florida Artificial Intelligence Research Society (FLAIRS-34),
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Refereed?: Yes, Invited?: No
78. S. Hannachi*, F. Najar* and N. Bouguila. (2021). Short Text Clustering using Generalized Dirichlet Multinomial Mixture Model. Lecture Notes in Communications in Computer and Information Science 1371, Springer. 13th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2021), (149-161)
Conference Date: 2021/4
Paper
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Refereed?: Yes, Invited?: No
79. X. Sumba*, N. Zamzami* and N. Bouguila. (2021). Clustering Count Data with Stochastic Expectation Propagation. Lecture Notes in Computer Sciences 12672, Springer. 13th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2021), (119-129)
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Paper
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Refereed?: Yes, Invited?: No
80. O. Bregu*, N. Zamzami and N. Bouguila. (2021). Mixture-Based Unsupervised Learning for Positively Correlated Count Data. Lecture Notes in Computer Sciences 12672, Springer. 13th Asian Conference on Intelligent Information and Database Systems (ACIIDS 2021), (144-154)
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Paper
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Refereed?: Yes, Invited?: No
81. M. S. Ahmadzadeh*, N. Manouchehri* and N. Bouguila. (2021). Entropy-Based Variational Learning of Finite Inverted Dirichlet Mixture Model. Lecture Notes in Computer Sciences 12672, Springer. Asian Conference on Intelligent Information and Database Systems (ACIIDS 2021), (130-143)
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Refereed?: Yes, Invited?: No
82. M. Azam*, J. Singh* and N. Bouguila. (2021). Spatial Image Segmentation Based on Beta-Liouville Mixture Models and Markov Random Field. IEEE. 22nd IEEE International Conference on Industrial Technology (IEEE ICIT 2021), (936-941)
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83. Y. Pawar*, M. Amayri and N. Bouguila. (2021). Performance Evaluation of Adversarial Learning for Anomaly Detection using Mixture Models. IEEE. 22nd IEEE International Conference on Industrial Technology, (913-918)
Conference Date: 2021/3
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84. F. Najar*, S. Bourouis, M. Alshar'e, R. Alroobaea, N. Bouguila, A. H. Al Badi and I. Channoufi. (2020). Efficient Statistical Learning Framework with Applications to Human Activity and Facial Expression Recognition. International Conference on Advanced Technologies for Signal & Image Processing (ATSIP'2020),
Paper
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85. V. K. Ghassab*, K. Maanicshah*, P. Green and N. Bouguila. (2020). REP-Model: A deep learning framework for replacing ad billboards in soccer videos. IEEE. IEEE International Symposium on Multimedia (IEEE ISM), (149-153)
Conference Date: 2020/12
Paper
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Refereed?: Yes, Invited?: No
86. F. Alalyan*, N. Zamzami* and N. Bouguila. (2020). A Hybrid Approach Based on SVM and Bernoulli Mixture Model for Binary Vectors Classification. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (1155-1160)
Conference Date: 2020/10
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87. Y. P. Pawar*, N. Zamzami* and N. Bouguila. (2020). An Effective Hybrid Anomaly Detection System Based on Mixture Models. IEEE. International Symposium on Networks, Computers and Communications (ISNCC), (1-6)
Conference Date: 2020/10
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88. M. H. Rahman* and N. Bouguila. (2020). Probabilistic Features on Simplex Manifold in Predictive Data Modelling. IEEE. International Symposium on Networks, Computers and Communications (ISNCC), (1-6)
Conference Date: 2020/10
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Refereed?: Yes, Invited?: No
89. P. Koochemeshkian*, N. Zamzami* and N. Bouguila. (2020). Distribution-Based Regression Models for Semi-Bounded Data Analysis. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (4073-4080)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No

90. M. Haddad*, V. K. Ghassab*, F. Najar* and N. Bouguila. (2020). Instance-Based learning for Human Action Recognition. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (147-153)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
91. P. Koochemeshkian*, N. Manouchehri* and N. Bouguila. (2020). Bivariate Beta Regression Models and Its Medical Applications. IEEE. International Symposium on Networks, Computers and Communications (ISNCC),
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
92. S. Ali* and N. Bouguila. (2020). Maximum A Posteriori Approximation of Dirichlet and Beta-Liouville Hidden Markov Models for Proportional Sequential Data Modeling. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (4081-4087)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
93. Y. P. Pawar*, M. Amayri and N. Bouguila. (2020). Performance Evaluation of Geometric Area Analysis Technique for Anomaly Detection Using Trapezoidal Area Estimation. IEEE. International Symposium on Networks, Computers and Communications (ISNCC), (1-6)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
94. M. H. Rahman* and N. Bouguila. (2020). Inverted Dirichlet and Related Distributions Based Feature Mapping for Data Classification. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (3588-3593)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
95. S. Amudala*, S. Ali* and N. Bouguila. (2020). Variational Inference of Infinite Generalized Gaussian Mixture Models with Feature Selection. IEEE. IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC), (120-127)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
96. F. Najar* and N. Bouguila. (2020). Image Categorization using Agglomerative Clustering Based Smoothed Dirichlet Mixtures. Lecture Notes in Computer Science, Vol. 12510, Springer. 15th International Symposium on Visual Computing (ISVC 2020), (27-38)
Conference Date: 2020/10
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Refereed?: Yes, Invited?: No

97. S. Ali* and N. Bouguila. (2020). Online Learning for Beta-Liouville Hidden Markov Models: Incremental Variational Learning for Video Surveillance and Action Recognition. IEEE. IEEE International Conference on Image Processing (IEEE ICIP), (3249-3253)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
98. F. Najar*, N. Zamzami* and N. Bouguila. (2020). Recognition of Human Interactions in Feature Films based on Infinite Mixture of EDCM. IEEE. International Symposium on Networks, Computers and Communications (ISNCC), (1-6)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
99. O. Graja*, F. Najar* and N. Bouguila. (2020). Generalized Inverted Dirichlet Optimal Predictor for Image Inpainting. Lecture Notes in Computer Science, Vol. 12509, Springer. 15th International Symposium on Visual Computing (ISVC 2020), (410-421)
Conference Date: 2020/10
Paper
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Refereed?: Yes, Invited?: No
100. N. Manouchehri*, O. Dalhoumi*, M. Amayri* and N. Bouguila. (2020). Variational Learning of a Shifted Scaled Dirichlet Model with Component Splitting Approach. IEEE. IEEE International Conference on Artificial Intelligence for Industries (AI4I), (75-78)
Conference Date: 2020/9
Paper
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Refereed?: Yes, Invited?: No
101. S. Ali* and N. Bouguila. (2020). On Maximum A Posteriori Approximation of Hidden Markov Models for Proportional Data. IEEE. IEEE 22nd International Workshop on Multimedia Signal Processing (IEEE MMSP), (1-6)
Conference Date: 2020/9
Paper
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Refereed?: Yes, Invited?: No
102. N. Zamzami*, P. Koochemeshkian* and N. Bouguila. (2020). A Distribution-Based Regression for Real-Time COVID-19 Cases Detection from Chest X-Ray and CT Image. IEEE. IEEE 21st International Conference on Information Reuse and Integration for Data Science (IRI2020), (104-111)
Conference Date: 2020/8
Paper
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Refereed?: Yes, Invited?: No
103. M. Amirkhani*, N. Manouchehri* and N. Bouguila. (2020). Fully Bayesian Learning of Multivariate Beta Mixture Models. IEEE. IEEE 21st International Conference on Information Reuse and Integration for Data Science (IRI2020), (120-127)
Conference Date: 2020/8
Paper
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Refereed?: Yes, Invited?: No

104. S. Amudala*, S. Ali* and N. Bouguila. (2020). Background Subtraction with a Hierarchical Pitman-Yor Process Mixture Model of Generalized Gaussian Distributions. IEEE. IEEE 21st International Conference on Information Reuse and Integration for Data Science (IRI2020), (112-119)
Conference Date: 2020/8
Paper
Published
Refereed?: Yes, Invited?: No
105. X. Sumba*, N. Zamzami* and N. Bouguila. (2020). Improving the EDCM Mixture Model with Expectation Propagation. AAAI. 33rd International FLAIRS Conference (FLAIRS-33),
Conference Date: 2020/5
Paper
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Refereed?: Yes, Invited?: No
106. M. Rasti*, N. Manouchehri* and N. Bouguila. (2020). MCMC-Based Learning of Finite Bivariate Beta Mixture Models. AAAI. 33rd International FLAIRS Conference (FLAIRS-33), (621-624)
Conference Date: 2020/5
Paper
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Refereed?: Yes, Invited?: No
107. F. Najar* and N. Bouguila. (2020). Happiness Analysis with Fisher Information of Dirichlet-Multinomial Mixture Model. Lecture Notes in Computer Science 12109, Springer. 33rd Canadian Conference on Artificial Intelligence (Canadian AI 2020), (438-444)
Conference Date: 2020/5
Paper
Published
Refereed?: Yes, Invited?: No
108. X. Sumba* and N. Bouguila. (2020). Improving Classification using Topic Correlation and Expectation Propagation. Lecture Notes in Computer Science 12109. 33rd Canadian Conference on Artificial Intelligence (Canadian AI 2020), (496-507)
Conference Date: 2020/5
Paper
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Refereed?: Yes, Invited?: No
109. M. Daghyani*, N. Zamzami* and N. Bouguila. (2019). Efficient Computation of Log-likelihood Function in Clustering Overdispersed Count Data using Multinomial-Beta Liouville Distribution. IEEE. IEEE Symposium Series on Computational Intelligence, (986-993)
Conference Date: 2020/12
Paper
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Refereed?: Yes, Invited?: No
110. M. H. Rahman* and N. Bouguila. (2019). Distribution Based Feature Mapping for Classifying Count Data. IEEE. IEEE Symposium Series on Computational Intelligence, (2440-2447)
Conference Date: 2019/12
Paper
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Refereed?: Yes, Invited?: No

111. Y. Zhang, W. Fan and N. Bouguila. (2019). Unsupervised Image Categorization Based on Variational Autoencoder and Student's-T Mixture Model. IEEE. IEEE Symposium Series on Computational Intelligence, (2403-2400)
Conference Date: 2019/12
Paper
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Refereed?: Yes, Invited?: No
112. Z. Song*, O. Bregu*, S. Ali*, and N. Bouguila. (2019). Variational Inference for Finite Asymmetric Gaussian Mixture Models. IEEE. IEEE Symposium Series on Computational Intelligence, (2448-2454)
Conference Date: 2019/12
Paper
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Refereed?: Yes, Invited?: No
113. M. Amayri*, F. Najar*, N. Bouguila, S. Ploix and F. Wurtz. (2019). A Statistical Process Control Chart Approach for Occupancy Estimation in Smart Buildings. IEEE. IEEE Symposium Series on Computational Intelligence, (1729-1734)
Conference Date: 2019/12
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Refereed?: Yes, Invited?: No
114. N. Manouchehri*, M. Rahmanpour, N. Bouguila and W. Fan. (2019). Learning of Multivariate Beta Mixture Models via Entropy-Based Component Splitting. IEEE. IEEE Symposium Series on Computational Intelligence, (2825-2832)
Conference Date: 2019/12
Paper
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Refereed?: Yes, Invited?: No
115. S. Amudala*, S. Ali*, F. Najar* and N. Bouguila. (2019). Variational Inference of Finite Generalized Gaussian Mixture Models. IEEE. IEEE Symposium Series on Computational Intelligence, (2433-2439)
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No
116. S. Ali* and N. Bouguila. (2019). Hybrid Generative-Discriminative Generalized Dirichlet-based Hidden Markov Models and Support Vector Machines. IEEE. IEEE International Symposium on Multimedia, (231-234)
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No
117. V. K. Ghassab* and N. Bouguila. (2019). An Embedding Framework for Video Reconstruction using Gaussian Mixture Models. IEEE. IEEE Global Conference on Signal and Information Processing, (1-5)
Conference Date: 2019/11
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Refereed?: Yes, Invited?: No

118. O. Graja* and N. Bouguila. (2019). Finite Inverted Dirichlet Mixture Optimal Pixel Predictor. IEEE. IEEE Global Conference on Signal and Information Processing, (1-5)
Conference Date: 2019/10
Paper
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Refereed?: Yes, Invited?: No
119. N. Manouchehri*, H. Nguyen*, and N. Bouguila. (2019). Component Splitting-Based Approach for Multivariate Beta Mixture Models Learning. IEEE. IEEE Global Conference on Signal and Information Processing, (1-5)
Conference Date: 2019/10
Paper
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Refereed?: Yes, Invited?: No
120. N. Zamzami* and N. Bouguila. (2019). An Accurate Evaluation of MSD Log-Likelihood and its Application in Human Action Recognition. IEEE. IEEE Global Conference on Signal and Information Processing, (1-5)
Conference Date: 2019/10
Paper
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Refereed?: Yes, Invited?: No
121. S. Ali* and N. Bouguila. (2019). Dynamic Texture Recognition using a Hybrid Generative-Discriminative Approach with Hidden Markov Models and Support Vector Machines. IEEE. IEEE Global Conference on Signal and Information Processing, (1-5)
Conference Date: 2019/10
Paper
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Refereed?: Yes, Invited?: No
122. H. Nguyen*, M. Rahmanpour*, N. Manouchehri*, K. Mannichah*, M. Amayri, and N. Bouguila. (2019). A Statistical Approach for Unsupervised Occupancy Detection and Estimation in Smart Buildings. IEEE. IEEE International Smart Cities Conference, (414-419)
Conference Date: 2019/10
Paper
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Refereed?: Yes, Invited?: No
123. K. Mannichah*, S. Ali*, W. Fan, and N. Bouguila. (2019). Unsupervised Variational Learning of Finite Generalized Inverted Dirichlet Mixture Models with Feature Selection and Component Splitting. Lecture Notes in Computer Science 11662. 16th International Conference on Image Analysis and Recognition, (94-105)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
124. M. Azam* and N. Bouguila. (2019). Texture Image Categorization in Wavelet Domain Via Naïve Bayes Classifier Based on Laplace and Generalized Gaussian Distribution. IEEE. IEEE 20th International Conference on Information Reuse and Integration for Data Science, (143-150)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No

125. H. Nguyen*, M. Kalra*, M. Azam*, and N. Bouguila. (2019). Data Clustering using Online Variational Learning of Finite Scaled Dirichlet Mixture Models. IEEE. IEEE 20th International Conference on Information Reuse and Integration for Data Science, (267-274)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
126. F. Najar*, N. Zamzami*, and N. Bouguila. (2019). Fake News Detection using Bayesian Inference. IEEE. IEEE 20th International Conference on Information Reuse and Integration for Data Science, (389-394)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
127. Z. Song*, S. Ali*, and N. Bouguila. (2019). Bayesian Learning of Infinite Asymmetric Gaussian Mixture Models for Background Subtraction. Lecture Notes in Computer Science 11662, Springer. International Conference on Image Analysis and Recognition, (264-274)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
128. H. Nguyen*, K. Mannichah*, M. Azam*, and N. Bouguila. (2019). Data Clustering using Variational Learning of Finite Scaled Dirichlet Mixture Models with Component Splitting. Lecture Notes in Computer Science 11662. 16th International Conference on Image Analysis and Recognition, (94-105)
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
129. F. Al-Alyan*, N. Zamzami*, and N. Bouguila. (2019). Model-Based Hierarchical Clustering for Categorical Data. IEEE. IEEE International Symposium on Industrial Electronics, (1424-1429)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
130. J. S. Kalsi* and N. Bouguila. (2019). Color Image Segmentation using Generalized Inverted Dirichlet Finite Mixture Models By Integrating Spatial Information. IEEE. IEEE International Symposium on Industrial Electronics, (1379-1384)
Conference Date: 2019/6
Paper
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Refereed?: Yes, Invited?: No
131. S. Ali* and N. Bouguila. (2019). Variational Learning of Beta-Liouville Hidden Markov Models for Infrared Action Recognition. IEEE. 15th IEEE Workshop on Perception Beyond the Visible Spectrum, (898-906)
Conference Date: 2019/6
Paper
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Refereed?: Yes, Invited?: No

132. N. Zamzami*, M. Amayri*, N. Bouguila, and S. Ploix. (2019). Online Clustering for Estimating Occupancy in an Office Setting. IEEE. IEEE International Symposium on Industrial Electronics, (2195-2200)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
133. N. Manouchehri*, J. S. Kalsi*, M. Amayri*, and N. Bouguila. (2019). Finite Two-Dimensional Beta Mixture Model Selection and Applications. IEEE. IEEE International Symposium on Industrial Electronics, (1407-1412)
Conference Date: 2019/6
Paper
Published
Refereed?: Yes, Invited?: No
134. D-H. Nguyen*, M. Azam*, and N. Bouguila. (2019). Data Clustering using Variatioanl Learning of Finite Scaled Dirichlet Mixture Models. IEEE. IEEE International Symposium on Industrial Electronics, (1391-1396)
Conference Date: 2019/6
Paper
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Refereed?: Yes, Invited?: No
135. K. Mannichah*, N. Bouguila, and W. Fan. (2019). Variational Learning of Finite Generalized Inverted Dirichlet Mixture Models with a Component Splitting Approach. IEEE. IEEE International Symposium on Industrial Electronics, (1453-1458)
Conference Date: 2019/6
Paper
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136. D. Ankam* and N. Bouguila. (2019). Generalized Dirichlet Regression and other Compositional Models with Application to Market-Share Data Mining of Information Technology Companies. International Conference on Enterprise Information Systems, (158-166)
Conference Date: 2019/5
Paper
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Refereed?: Yes, Invited?: No
137. N. Manouchehri* and N. Bouguila. (2019). A Probabilistic Approach Based on a Finite Mixture Model of Multivariate Beta Distributions. International Conference on Enterprise Information Systems, (373-380)
Conference Date: 2019/5
Paper
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138. F. Alalyan*, N. Zamzami*, M. Amayri*, and N. Bouguila. (2019). An Improved K-Medoids Algorithm Based on Binary Sequences Similarity Measures. IEEE. International Conference on Control, Decision and Information Technologies, (1723-1728)
Conference Date: 2019/4
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139. D. Ankam*, N. Bouguila, and M. Amayri*. (2019). Beta-Liouville Regression and Applications. IEEE. International Conference on Control, Decision and Information Technologies, (1740-1745)
Conference Date: 2019/4
Paper
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Refereed?: Yes, Invited?: No
140. I. Channoufi*, S. Bourouis, N. Bouguila, K. Hamrouni. (2018). Color Image Segmentation with Bounded Generalized Gaussian Mixture Model and Feature Selection. 4th International Conference on Advanced Technologies for Signal & Image Processing (ATSIP'2018),
Paper
Published
Refereed?: Yes, Invited?: No
141. B. Alghabashi* and N. Bouguila. (2018). Finite Multi-Dimensional Generalized Gamma Mixture Model Learning Based on MML. IEEE. IEEE 17h International Conference on Machine Learning and Applications, (1131-1138)
Conference Date: 2018/12
Paper
Published
Refereed?: Yes, Invited?: No
142. M. Azam* and N. Bouguila. (2018). Bounded Laplace Mixture Model with Applications to Image Clustering and Content Based Image Retrieval. IEEE. IEEE 17h International Conference on Machine Learning and Applications, (558-563)
Conference Date: 2018/12
Paper
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Refereed?: Yes, Invited?: No
143. S. Fu* and N. Bouguila. (2018). Asymmetric Gaussian-Based Statistical Models Using Markov Chain Monte Carlo Techniques for Image Categorization. IEEE. IEEE 17h International Conference on Machine Learning and Applications, (1205-1208)
Conference Date: 2018/12
Paper
Published
Refereed?: Yes, Invited?: No
144. R. Alsuroji*, N. Zamzami*, and N. Bouguila. (2018). Model Selection and Estimation of a Finite Shifted-Scaled Dirichlet Mixture Model. IEEE. IEEE 17h International Conference on Machine Learning and Applications, (707-713)
Conference Date: 2018/12
Paper
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Refereed?: Yes, Invited?: No
145. J. Fu, W. Fan, and N. Bouguila. (2018). A Novel Approach for Anomaly Event Detection in Videos Based on Autoencoders and SE Networks. IEEE. International Symposium on Signal, Image, Video and Communications, (179-184)
Conference Date: 2018/11
Paper
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Refereed?: Yes, Invited?: No

146. N. Manouchehri* and N. Bouguila. (2018). Learning of Finite Two-Dimensional Beta Mixture Models. IEEE. International Symposium on Signal, Image, Video and Communications, (227-232)
Conference Date: 2018/11
Paper
Published
Refereed?: Yes, Invited?: No
147. Y. Chen, L. Zhou, N. Bouguila, F. Wu, J. Du, C. Wang, and H. Li. (2018). Semi-Convex Hull Tree: Fast Nearest Neighbor Queries for Large Scale Data on GPUs. IEEE. IEEE International Conference on Data Mining, (911-916)
Conference Date: 2018/11
Paper
Published
Refereed?: Yes, Invited?: No
148. O. Graja*, N. Bouguila, and M. Azam*. (2018). Breast Cancer Diagnosis using Quality Control Charts and Logistic Regression. IEEE. International Symposium on Signal, Image, Video and Communications, (215-220)
Conference Date: 2018/11
Paper
Published
Refereed?: Yes, Invited?: No
149. R. Alsuroji*, N. Bouguila, and N. Zamzami*. (2018). Predicting Defect-Prone Software Modules Using Shifted-Scaled Dirichlet Distribution. IEEE. IEEE International Conference on Artificial Intelligence for Industries, (703-713)
Conference Date: 2018/9
Paper
Published
Refereed?: Yes, Invited?: No
150. N. Zamzami* and N. Bouguila. (2018). Consumption Behavior Prediction using Hierarchical Bayesian Frameworks. IEEE. IEEE International Conference on Artificial Intelligence for Industries, (703-713)
Conference Date: 2018/9
Paper
Published
Refereed?: Yes, Invited?: No
151. K. Ihou* and N. Bouguila. (2018). A Smoothed Latent Generalized Dirichlet Allocation Model in the Collapsed Space. IEEE. IEEE International Midwest Symposium on Circuits and Systems, (877-880)
Conference Date: 2018/8
Paper
Published
Refereed?: Yes, Invited?: No
152. M. Azam* and N. Bouguila. (2018). Speaker Verification Using Adapted Bounded Gaussian Mixture Model. IEEE. IEEE 19th Conference on Information Reuse and Integration for Data Science, (300-307)
Conference Date: 2018/8
Paper
Published
Refereed?: Yes, Invited?: No

153. D. Ankam* and N. Bouguila. (2018). Compositional Data Analysis with PLS-DA and Security Applications. IEEE. IEEE 19th Conference on Information Reuse and Integration for Data Scienc, (338-345)
Conference Date: 2018/8
Paper
Published
Refereed?: Yes, Invited?: No
154. M. Azam* and N. Bouguila. (2018). Blind Source Separation as Pre-processing to Unsupervised Keyword Spotting Via an ICA Mixture Model. IEEE. IEEE International Midwest Symposium on Circuits and Systems, (833-836)
Conference Date: 2018/8
Paper
Published
Refereed?: Yes, Invited?: No
155. B. Alghabashi* and N. Bouguila. (2018). A Finite multi-dimensional generalized Gamma Mixture Model. IEEE. IEEE Conference on Smart Data, (807-814)
Conference Date: 2018/7
Paper
Published
Refereed?: Yes, Invited?: No
156. I. Channoufi*, S. Bourouis, N. Bouguila, K. Hamrouni. (2018). Spatially Constrained Mixture Model with Feature Selection for Image and Video Segmentation. Lecture Notes in Computer Science 10884, sPRINGER. International Conference on Image and Signal Processing, (36-44)
Conference Date: 2018/7
Paper
Published
Refereed?: Yes, Invited?: No
157. F. Aldosari, S. Bourouis, N. Bouguila, H. Sallay, K. M. J. Khayyat. (2018). Infinite Scaled Dirichlet Mixture Models for Spam Filtering Via Bayesian and Variational Bayes Learning. IEEE. IEEE International Conference on Computer and Information Technology, (1841-1847)
Conference Date: 2018/7
Paper
Published
Refereed?: Yes, Invited?: No
158. S. Bourouis, N. Bouguila, Y. Li*, and M. Azam*. (2018). Visual Scene Reconstruction using a Bayesian Learning Framework. Lecture Notes in Computer Science 10884, Springer. International Conference on Image and Signal Processing, (225-232)
Conference Date: 2018/7
Paper
Published
Refereed?: Yes, Invited?: No
159. Zamzami* and N. Bouguila. (2018). Text modeling Using Multinomial Scaled Dirichlet Distributions. Lecture Notes in Computer Science 10868, Springer. International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems, (69-80)
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No

160. I. Channoufi*, S. Bourouis, N. Bouguila, K. Hamrouni. (2018). A Flexible Statistical Model for Image Denoising. Lecture Notes in Computer Science 10882, Springer. International Conference on Image Analysis and Recognition, (30-38)
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
161. W. Fan and N. Bouguila. (2018). An Accelerated Variational Framework for Face Expression Recognition. IEEE. IEEE International Black Sea Conference on Communication and Networking, (1-5)
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
162. S. Bourouis, A. Zaguia, and N. Bouguila. (2018). Hybrid Statistical Framework for Diabetic Retinopathy Detection. Lecture Notes in Computer Science 10882, Springer. International Conference on Image Analysis and Recognition, (687-694)
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
163. F. Najar*, S. Bourouis, A. Zaguia, N. Bouguila, and S. Belgith. (2018). Unsupervised Human Action Categorization Using A Riemannian Averaged Fixed-Point Learning of Multivariate GGMM. Lecture Notes in Computer Science 10882, Springer. 15th International Conference on Image Analysis and Recognition, (408-415)
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
164. S. Fu* and N. Bouguila. (2018). An Intrusion Detection Model Based on Asymmetric Gaussian Mixtures with Reversible Jump MCMC. IEEE. International Conference on Cyber Security and Protection of Digital Services, (1-8)
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
165. W. Fan, S. Bourouis, N. Bouguila, F. Aldosari, H. Sallay and K. M. J. Khayyat. (2018). EP-Based Infinite Inverted Dirichlet Mixture Learning: Application to Image Spam Detection. Lecture Notes in Computer Science 10868, Springer. International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems, (342-354)
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
166. S. Fu* and N. Bouguila. (2018). Bayesian Learning of Finite Asymmetric Gaussian Mixtures. Lecture Notes in Computer Science 10868, Springer. International conference on Industrial Engineering & Other Applications of Applied Intelligent Systems, (355-365)
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No

167. F. Najar*, S. Bourouis, N. Bouguila, and S. Belghith. (2018). A Fixed-Point Estimation Algorithm for Learning the Multivariate GGMM: Application to Human Action Recognition. IEEE. IEEE 31st Canadian Conference on Electrical and Computer Engineering, (1-4)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No
168. S. Fu* and N. Bouguila. (2018). Asymmetric Gaussian Mixtures with Reversible Jump MCMC. IEEE. IEEE 31st Canadian Conference on Electrical and Computer Engineering, (1-4)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No
169. N. Zamzami* and N. Bouguila. (2018). MML-Based Approach for Determining the Number of Topics in EDCM Mixture Models. Lecture Notes in Computer Science 10832, Springer. Canadian conference on Artificial Intelligence, (211-217)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No
170. J. Singh* and N. Bouguila. (2018). Spatially Constrained Inverted Dirichlet Mixture Model for Image Segmentation. IEEE. IEEE 31st Canadian Conference on Electrical and Computer Engineering, (1-4)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No



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Professor Jeremy William Clark

Correspondence language: English

Contact Information

The primary information is denoted by (*)

Address

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115 Flordia Drive
Beaconsfield Quebec H9W 1M1
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Telephone

Home	1-514-4734211
Work (*)	1-514-8482424 extension: 5381

Email

Personal	pulpspy@gmail.com
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Professor Jeremy Clark

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes

Degrees

- 2013/8 Post-doctorate, Computer Science, Carleton University
Supervisors: Paul C. van Oorschot, 2011/7 - 2013/8
- 2011/6 Doctorate, Computer Science, University of Waterloo
Supervisors: Urs Hengartner, 2007/9 - 2011/6
- 2007/10 Master's Thesis, Electrical Engineering, University of Ottawa
Supervisors: Carlisle Adams, 2005/9 - 2007/10
- 2004/4 Bachelor's Honours, Computer Engineering, University of Western Ontario

Recognitions

- 2017/5 Excellence in Teaching Award
Concordia University
Prize / Award
Excellence in Teaching Award, Junior Faculty Member, Faculty (ENCS) level

User Profile

Research Specialization Keywords: Blockchain technology, End-to-end verifiable voting systems

Employment

- 2018/6 Associate Professor
CIISE, Gina Cody School of Engineering and Computer Science, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2013/8 - 2018/5 Assistant Professor
Concordia Institute for Information Systems Engineering, Faculty of Engineering and Computer Science, Concordia University
Full-time, Assistant Professor
Tenure Status: Tenure Track

2014/11 - 2015/9 Subject Matter Expert on Internet Voting Security
Election Services, City of Toronto

Leaves of Absence and Impact on Research

2019/11 - 2020/6 Parental, Concordia University
Reduced research output in 2020.

Research Funding History

Awarded [n=8]

Co-investigator The Human-Centric Cybersecurity Partnership (HC2P), Grant

2021/5 - 2026/4 Discovery Grant, Grant

Principal Investigator

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery Grant

Total Funding - 125,000

Portion of Funding Received - 100

Funding Competitive?: Yes

2021/5 - 2026/4 Discovery Grant, Grant

Principal Investigator

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Total Funding - 175,000

Portion of Funding Received - 100

Funding Competitive?: Yes

2019/11 - 2025/6 NSERC / Raymond Chabot Grant Thornton / Catallaxy Industrial Research Chair on
Principal Investigator Blockchain Technologies, Research Chair

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Industrial Research Chair

Total Funding - 1,470,000

Portion of Funding Received - 100

Funding Competitive?: Yes

2018/2 - 2020/1 Understanding Blockchains through Experimentation, Grant

Principal Investigator

Funding Sources:

Autorité des marchés financiers

Education and Good Governance Fund (EGGF)

Total Funding - 200,000

Portion of Funding Received - 50

Funding Competitive?: Yes

Co-investigator : Emilio Boulianne

2015/4 - 2017/3 Vote par Internet : des technologies favorisant la démocratie / Democracy Enhancing
Principal Applicant Technologies for Internet Voting, Grant

Funding Sources:

Fonds de recherche du Québec - Nature et technologies (FRQNT)

Nouveaux chercheurs

Total Funding - 38,000

Portion of Funding Received - 100

	Funding Competitive?: Yes
2015/5 - 2016/3 Co-applicant	Certificate Authority Report Card: Examining the Root of Data Protection on the Web, Grant Funding Sources: Office of the Privacy Commissioner of Canada Contributions Program Total Funding - 50,000 Portion of Funding Received - 50 Funding Competitive?: Yes Co-investigator : Mohammad Mannan
2013/8 - 2015/4 Principal Applicant	Start-up Grant, Grant Funding Sources: Concordia University Total Funding - 50,000 Portion of Funding Received - 50,000 Funding Competitive?: No

Student/Postdoctoral Supervision

Master's Thesis [n=10]

Principal Supervisor	Youwei Deng (In Progress) Thesis/Project Title: Topic: applications of succinct zero knowledge proofs
2021/5 - 2022/9 Co-Supervisor	Sina Pilehchiha (Completed) , Concordia University Thesis/Project Title: Improving Reproducibility in Smart Contract Research Present Position: Software Engineer, Quantstamp
2020/1 - 2022/4 Co-Supervisor	Mehdi Salehi (Completed) , Concordia University Thesis/Project Title: An Analysis of Upgradeability, Oracles, and Stablecoins in the Ethereum Blockchain Present Position: Integration Engineer, Offchain Labs
2019/9 - 2020/8 Co-Supervisor	Corentin Thomasset (Completed) , Polytechnique Montréal Thesis/Project Title: "SERENIoT : Politiques de sécurité collaboratives pour maisons connectées"
2019/9 - 2022/12 Principal Supervisor	Mehdi Nejadgholi (Completed) , Concordia University Thesis/Project Title: Nullification, a coercion-resistance add-on for e-voting protocols
2016/5 - 2017/12 Principal Supervisor	Chidinma Okoye (Completed) , Concordia University Thesis/Project Title: "New applications of blockchain technology to voting and lending" Present Position: Developer, Deloitte
2015/9 - 2018/4 Principal Supervisor	Seyedehmahsa Moosavi (Completed) , Concordia University Thesis/Project Title: "Rethinking Certificate Authorities: Understanding and decentralizing domain validation" Present Position: PhD Student, Concordia University
2014/9 - 2018/8 Principal Supervisor	Michael Colburn (Completed) , Concordia University Thesis/Project Title: "Short-Lived Signatures" Present Position: Engineer, Trail of Bits

2014/9 - 2017/8
Co-Supervisor
Abhimanyu Khanna (Completed) , Concordia University
Thesis/Project Title: TLS Proxy with Improved Security Assurances
Present Position: Lead Penetration Tester, KPMG

2013/12 - 2014/8
Co-Supervisor
Shayan Eskandari (Completed) , Concordia University
Thesis/Project Title: Real world deployability and usability of Bitcoin
Present Position: Chief Technology Officer (CTO), Ether Capital

Doctorate [n=7]

2018/9
Principal Supervisor
Mohammadreza Rahimian (In Progress) , Concordia University
Thesis/Project Title: Topic: Validating Smart Contracts on Ethereum (Part-time student)
Present Position: Senior System Administrator, Societe Generale Corporate and Investment Banking

2018/5
Principal Supervisor
Seyedehmahsa Moosavi (In Progress) , Concordia University
Thesis/Project Title: Topic: Decentralized finance and market microstructures
Present Position: PhD Student, Concordia University

2018/1 - 2022/12
Principal Supervisor
Didem Demirag (Completed) , Concordia University
Thesis/Project Title: Moving Multiparty Computation Forward for the Real World
Present Position: Post Doctoral Fellow, UQAM

2017/9
Principal Supervisor
Shayan Eskandari (In Progress) , Concordia University
Thesis/Project Title: Topic: Understanding and Mitigating Criminal and Unethical Blockchain Activities
Present Position: PhD Student / Engineer, Concordia University / ConsenSys Diligence

2017/5
Co-Supervisor
Pratyusha Bhattacharya (In Progress) , Concordia University
Thesis/Project Title: Topic: Smart Grid Applications for Blockchain Technology
Present Position: PhD Student, Concordia University

2014/8 - 2021/3
Co-Supervisor
Nan Yang (Completed) , Concordia University
Thesis/Project Title: Non-local contamination in cryptography
Present Position: Cryptographer, Government of Canada

2013/10 - 2015/5
Co-Supervisor
Gaby Dagher (Completed) , Concordia University
Thesis/Project Title: Toward secure and privacy-preserving data sharing and integration
Present Position: Assistant Professor, Boise State University

Post-doctorate [n=1]

2018/1 - 2018/9
Principal Supervisor
Elizabeth Stobert (Completed) , Concordia University
Thesis/Project Title: Topic: Usable Security
Present Position: Faculty, Carleton University

Event Administration

2019/7 - 2020/9
General Chair, The 20th Privacy Enhancing Technologies Symposium, Conference, 2020/7 - 2020/7

2018/9 - 2018/5
Program Chair, 3rd Workshop on Advances in Secure Electronic Voting, Financial Cryptography 2018, Workshop, 2018/3 - 2018/3

2016/9 - 2017/4
Chair, SERENE-RISC Spring 2017 Workshop, The Smart Cybersecurity Network (SERENE-RISC), Networks of Centers of Excellence, Workshop, 2017/4 - 2017/4

2015/9 - 2016/4
Program Chair, 3rd Workshop on Bitcoin and Blockchain Research, Financial Cryptography 2016, Workshop, 2016/2 - 2016/2

2015/9 - 2016/4 Program Chair, 4th Workshop on Advances in Secure Electronic Voting, Financial Cryptography 2019, Workshop, 2019/2 - 2019/2

Editorial Activities

2020/4 - 2020/4 Editor, Bracciali, A., Clark, J., Pintore, F., Roenne, P., Sala, M. (Editors). "Financial Cryptography and Data Security: FC Workshops 2019." Lecture Notes in Computer Science (LNCS) 11599. Springer, 2020., Book

2019/2 - 2019/2 Editor, A. Zohar, I. Eyal, V. Teague, J. Clark, A. Bracciali, F. Pintore, M. Sala (Editors). "Financial Cryptography and Data Security: FC Workshops 2017." LNCS 10958, Springer., Book

2016/9 - 2016/9 Editor, J. Clark, S. Meiklejohn, P.Y.A.Ryan, D. Wallach, M. Brenner, K. Rohloff (Editors). "Financial Cryptography and Data Security: FC Workshops 2016." LNCS 9604, Springer, Book

2013/4 - 2015/8 Editorial Board, USENIX Journal of Election Technology and Systems (JETS); defunct as of 2015, Journal

Knowledge and Technology Translation

2019/11 - 2019/11 Subject Matter Expert, Citizen Engagement
 Group/Organization/Business Serviced: Elections Quebec
 Target Stakeholder: Policy Maker/Regulator
 Outcome / Deliverable: Citizen jury on internet voting organized by Institut du Nouveau Monde (INM) for Elections Quebec. Final policy report published.
 Evidence of Uptake/Impact: Consistent with the position I argued: "The 12 members of the Citizen round table recommended that Internet voting should not be implemented in the short term, due to the related risks."
 References / Citations / Web Sites: <https://www.electionsquebec.qc.ca/english/researchers/internet-voting.php>

2019/1 - 2019/1 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Serviced: Lotto-Quebec
 Target Stakeholder: Policy Maker/Regulator
 Outcome / Deliverable: Individual consultation on gambling applications on blockchain
 Evidence of Uptake/Impact: Unknown

2016/9 - 2018/9 Subject Matter Expert, Standards Development
 Group/Organization/Business Serviced: Standards Council of Canada
 Target Stakeholder: Industrial Consortium
 Outcome / Deliverable: SMC/ISO/TC 307: Blockchain and electronic distributed ledger technologies

2017/3 - 2018/7 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Serviced: Autorité des marchés financiers (AMF)
 Target Stakeholder: Policy Maker/Regulator
 Outcome / Deliverable: A mini-course on cryptography and blockchain technology for Quebec's financial market regulators given occasionally over many months (overlapping with our grant from AMF), as well as attending various stakeholders meetings as an expert.
 Evidence of Uptake/Impact: Well attended, many questions, some input sought on reports and statements.

- 2017/8 - 2018/4
 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Served: Treasury Board of Canada Secretariat
 Target Stakeholder: Policy Maker/Regulator
 Outcome / Deliverable: Policy recommendations report (25+ contributors) and "Blockchain@GC" event.
 Evidence of Uptake/Impact: Report was never finished (to my knowledge) but a knowledge transfer event was successful (which I spoke at; see presentations).
- 2018/3 - 2018/3
 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Served: House of Commons: Standing Committee on Finance
 Target Stakeholder: Policy Maker/Regulator
 Outcome / Deliverable: Testimony on blockchain technology for the "Statutory Review of the Proceeds of Crime and Terrorist Financing Act"
 Evidence of Uptake/Impact: Uncertain.
- 2018/2 - 2018/2
 Subject Matter Expert, Business Innovation
 Group/Organization/Business Served: Canadian National Railway (CN)
 Target Stakeholder: Industry/Business (>500 employees)
 Outcome / Deliverable: Single consultation on blockchain technologies for transport and supply chain management with firm VPs
 Evidence of Uptake/Impact: Good response. Shortly after, CN joined Blockchain in Transport Alliance (BiTA)
- 2018/1 - 2018/1
 Subject Matter Expert, Consulting for Industry
 Group/Organization/Business Served: Investissement Quebec
 Target Stakeholder: Industrial Consortium
 Outcome / Deliverable: Single consultation on cryptocurrency mining operations in Quebec for Investissement Quebec (a company established by the government of Quebec)
 Evidence of Uptake/Impact: Well-attended with many questions. Uncertain uptake.
- 2017/8 - 2017/8
 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Served: Minister of Democratic Institutions
 Target Stakeholder: Policy Maker/Regulator
 Outcome / Deliverable: Roundtable consultation with Karina Gould, then Minister of Democratic Institutions (House of Commons, Canada)
 Evidence of Uptake/Impact: Advocated (1) against online voting at the Federal level due to security concerns and (2) developing municipal standards for online voting. Receptive to first (dovetailing CSE report), not to second (jurisdictional issues).
- 2016/7 - 2016/9
 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Served: Royal Canadian Mounted Police (RCMP)
 Target Stakeholder: Government Personnel
 Outcome / Deliverable: Participation in roundtable discussions on law enforcement and digital currencies with representatives from many federal government branches.
 Evidence of Uptake/Impact: Confidential
- 2016/3 - 2016/3
 Subject Matter Expert, Consultation Service
 Group/Organization/Business Served: National Research Council
 Target Stakeholder: Government Personnel
 Outcome / Deliverable: A mini-course on cybersecurity for project managers and team members

- 2013/11 - 2015/9 Subject Matter Expert, Consultation Service
 Group/Organization/Business Serviced: City of Toronto
 Target Stakeholder: Government Personnel
 Outcome / Deliverable: A series of audit reports, as well as meetings and discussions.
 Evidence of Uptake/Impact: The final decision of the city (not to proceed with online voting) referenced the issues we reported. Submissions by the city in an ensuing appeal over whether one of our reports could be released unredacted under a FIPA request argued that the severity of our findings would be harmful if released publicly.
 References / Citations / Web Sites: Toronto RFP: <https://t.co/0kgoDMIXzQ> Some documents released under freedom of information: <https://t.co/eQX8rq4GRw> IPC appeal decision: <https://t.co/yyMOdYXnSO>
 Activity Description: Security review of online voting systems provided by three vendors. Deeper analysis for selected system.
- 2015/5 - 2015/5 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Serviced: Cour du Québec
 Target Stakeholder: Government Personnel
 Outcome / Deliverable: Training for Quebec judges on cybercrime involving digital currencies at the Formation Régionale de la Cour du Québec.
- 2014/4 - 2014/4 Subject Matter Expert, Policy/Regulation Development
 Group/Organization/Business Serviced: Senate of Canada: Standing Committee on Banking, Trade and Commerce
 Target Stakeholder: Policy Maker/Regulator
 Outcome / Deliverable: Provided testimony on virtual currencies, with an emphasis on Bitcoin, with an oral presentation. Answered questions.
 Evidence of Uptake/Impact: Extensively cited in ensuing Senate report "Digital Currency: You Can't Flip This Coin!"
 References / Citations / Web Sites: <https://sencanada.ca/content/sen/committee/412/banc/rms/12jun15/home-e.htm>

Other Memberships

- 2018/12 Professional Engineer (P.Eng.), Professional Engineers of Ontario (PEO)

Presentations

1. (2019). Blockchain Technologies: Landscape and Future Directions. CFA Montreal FinTech Rendez-vous, Montreal, Canada
 Invited?: Yes, Keynote?: No
2. (2019). Introduction to Blockchain for Non-Profits. Social Innovation: Int'l Development and Blockchain, McGill, Montreal, Canada
 Invited?: Yes, Keynote?: No
3. (2019). Blockchain Technologies: Landscape and Future Directions. Blockchain lunch and learn, Canada Mortgage and Housing Corporation (CMHC), Ottawa, Canada
 Invited?: Yes, Keynote?: No
4. (2018). Ledgers Past, Present and Future. GC Blockchain Day, Treasury Board Secretariat of Canada, Ottawa, Canada
 Invited?: Yes, Keynote?: No

5. (2018). Blockchain Applications & Real-Estate. Panel, BMO 13th Annual Realestate Conference, Chicago, United States of America
Invited?: Yes, Keynote?: No
6. (2018). Blockchain Technologies: Landscape and Future Directions. 14th annual GoSec Cyber Security Conference (GoSec 2018), Montreal, Canada
Invited?: Yes, Keynote?: No
7. (2018). Workplace 2020. Panal, Management Consulting Club, Concordia, Montreal, Canada
Invited?: Yes, Keynote?: No
8. (2018). Blockchain Nuances. The first annual conference on FinTech and Banking Transformation (FinteQC), Levis, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
9. (2018). Blockchain Technologies: Landscape and Future Directions. BMO ThinkSeries, Montreal, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
10. (2018). Blockchain Technologies. Speaker Series, Canada Pension Plan Investment Board (CPPIB), Toronto, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
11. (2018). Blockchain Technologies: Landscape and Future Directions. True North Science Bootcamp, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
12. (2018). Democracy Enhancing Technologies. CryptoFest, Startupfest 2018, Montreal, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No
13. (2018). Liquid Democracy and Blockchains. Defending Democracy: Confronting Cyber-Threats At Home And Abroad, Ottawa, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
14. (2018). Blockchain Technology: Landscape & Future Directions. Montreal Police Pension Fund (ABRPPVM), Montreal, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
15. (2018). Blockchain Technology: National Security Use-Cases. Blockchain and National Security, Public Safety Canada, Ottawa, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
16. (2018). The Future of Money. Panel, The Walrus LIVE, Toronto, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No
17. (2018). Blockchain Nuances: Lessons from Fintech use-cases. Blockchain Technology Symposium (BTS), Fields Institute, Toronto, Canada
Invited?: Yes, Keynote?: No

18. (2018). Blockchain Technologies: Landscape and Future Directions. Anticipating Future Trends and Managing Risks Program, HEC Paris and John Molson Business School, Concordia University, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
19. (2018). Blockchain Technologies: Landscape and Future Directions. RISQ Colloquium, Montreal, Canada
Invited?: Yes, Keynote?: No
20. (2018). Cryptocurrencies: An Investable Asset?. Kenneth Woods Portfolio Management Program, Concordia University, Montreal, Canada
Invited?: Yes, Keynote?: No
21. (2018). Blockchain Technologies: Landscape and Future Directions. TriPAC Pension Advisory Committee Annual Meeting, Toronto, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
22. (2017). Bitcoin & Blockchains: Landscape and Future Directions. Hydro-Québec Symposium 3i, GlobalSIP 2017, Montreal, Canada
Invited?: Yes, Keynote?: No
23. (2017). Zero Knowledge. Blockchain Meetup, District 3, Montreal, Canada
Invited?: Yes, Keynote?: No
24. (2017). Provisions: Privacy-Preserving Proofs of Solvency. Seminar, Newcastle University, Newcastle-upon-Tyne, United Kingdom
Invited?: Yes, Keynote?: No
25. (2017). Blockchains: Smart Contracts and Media-Driven Crypto Currencies. Panel, Canada Music Week, Toronto, Canada
Invited?: Yes, Keynote?: No
26. (2017). Democracy Enhancing Technologies: From Theory to Practice. Speaker Series, Centre for the Study of Democratic Citizenship (CSDC), Montreal, Canada
Invited?: Yes, Keynote?: No
27. (2017). Bitcoin & Blockchains: Landscape and Future Directions. 15th International Conference on Privacy, Security and Trust (PST), Calgary, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
28. (2017). The Bitcoin & Blockchain Technology Landscape. 12th Metropolis World Congress, Montreal, Canada
Invited?: Yes, Keynote?: No
29. (2016). Bitcoin & Blockchains: Landscape and Future Directions. Bank of Canada, Ottawa, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
30. (2016). Blockchain and Voting: Assessment & Critique. Online Voting Roundtable: Electoral Futures in Canada, Ottawa, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
31. (2016). Bitcoin: an impartial assessment of its use and potential for cybercrime. Examining Cybercrime 2: Financial Edition, Anti-phishing working group (APWG), Symposium on Electronic Crime Research, Toronto, Canada
Invited?: Yes, Keynote?: No

32. (2016). Bitcoin & Blockchains: Tutorial. ASIMM Colloque RSI, Montreal, Canada
Invited?: Yes, Keynote?: No
33. (2016). Blockchain nuances.P2P Financial Systems Workshop, London, United Kingdom
Invited?: Yes, Keynote?: Yes
34. (2016). Bitcoin & Blockchains: Part 2. Bank of Canada, Ottawa, Canada
Invited?: Yes, Keynote?: No
35. (2016). Blockchain Technologies and the Future of Finance. C.D. Howe, Toronto, Canada
Invited?: Yes, Keynote?: No
36. (2016). Blockchain-based voting: potential and limitations. MIT Bitcoin Expo, MIT, Cambridge, United States of America
Invited?: Yes, Keynote?: No
37. (2016). The Bitcoin & Blockchain Technology Landscape. Symposium on Foundations & Practice of Security, Laval, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
38. (2016). The Future of Blockchain. Meetup, District 3, Montreal, Canada
Invited?: Yes, Keynote?: No
39. Arvind Narayanan (Princeton University), Matthew Green (Johns Hopkins University) and Peter Todd. (2014). Altcoins. Bitcoin Workshop, Center for Information Technology Policy (CITP), Princeton University, Princeton, United States of America
Invited?: Yes, Keynote?: No

Broadcast Interviews

- | | |
|----------------------------|--|
| 2020/05/26 -
2020/05/26 | Contact tracing, The Aaron Rand Show, CJAD 800 |
| 2017/12/05 -
2017/12/05 | Bitcoin regulation, Business Report, CBC Radio One |

Text Interviews

- | | |
|------------|--|
| 2020/05/25 | Are we ready for an app that trades privacy for more freedom?, Montreal Gazette |
| 2020/05/02 | Chaînes de blocs: dompter la décentralisation de l'informatique, Le Devoir |
| 2019/12/22 | Academic: All Undergrads Should Learn About Bitcoin & Blockchain, Cryptonews |
| 2018/07/13 | Banks Claim They're Building Blockchains. They're Not., Investopedia |
| 2018/03/20 | The evolution of cryptojacking, CryptoInsider |
| 2018/03/16 | The Ethics Of Cryptojacking: Rampant Malware Or Ad-Free Internet?, CoinTelegraph |
| 2018/03/14 | One of the Biggest Coinhive Users Made \$7.69 In 3 Months, Motherboard |
| 2018/03/10 | Attack Or Business Opportunity? Academics Question Ethics Of Coinhive Cryptojacking, CoinTelegraph |
| 2018/01/29 | How much should I regret not buying Bitcoin?, Gizmodo |
| 2017/06/21 | How blockchain-based payment is changing the cannabis industry, IBM thinkLeaders |
| 2017/02/28 | Ottawa explores potential of 'blockchain,' billed as next-generation Internet tech, Toronto Star |

2016/08/30	Block the vote: Could Blockchain Technology Cybersecure Elections?, Forbes
2016/05/02	He's Bitcoin's Creator, He Says, but Skeptics Pounce on His Claim, The New York Times
2016/02/19	Logged out, but still out there, Globe and Mail
2016/02/10	Princeton University releases first draft of bitcoin textbook, CoinDesk
2015/12/27	The top 10 cryptocurrency research papers of 2015, CoinDesk
2015/02/01	Canada's Internet Voting Problem, SC Magazine
2014/10/08	"Latest Internet voting reports show failures across the board", Al Jazeera America
2014/06/16	"How Block Chain Technology Could Usher in Digital Democracy", CoinDesk
2014/05/24	"Can Bitcoin help predict the future?", CoinDesk
2014/04/21	"Heartbleed and sentinels of the net: How a coding flaw called Heartbleed broke the Internet and how a small group of volunteer OpenSSL programmers saved it", The Montreal Gazette
2014/03/28	PROFESSOR: There Is A Big, Gaping Flaw In The New Satoshi Study, Business Insider
2014/02/12	"2014 Federal Budget Calls Bitcoin A Terrorist, Crime 'Risk'", The Huffington Post
2014/02/06	"Bitcoin: How its core technology will change the world", The New Scientist
2014/02/04	"Montreal's Bitcoin Embassy bridges gap between digital currency and real world", Montreal Gazette, Front Page of Business Section
2014/01/14	"More than money, bitcoin's real value lies in its algorithms", InfoWorld

Publications

Journal Articles

1. Erica Pimentel, Emilio Boulianne, Shayan Eskandari*, Jeremy Clark. (2021). Systemizing the Challenges of Auditing Blockchain-Based Assets. *Journal of Information Systems*.
Published
Refereed?: Yes, Open Access?: No
2. G. Dagher*, B. Fung, N. Mohammad, J. Clark. (2020). SecDM: Privacy-preserving Data Outsourcing Framework with Differential Privacy. *Knowledge and Information Systems (Springer)*. 62: 1923–1960.
Published
Refereed?: Yes
3. S. Ruoti, B. Kaiser, A. Yerukhimovich, J. Clark, R. Cunningham. (2020). Blockchain Technology: What is it good for?. *Communications of the ACM*. 63(1): 46-53.
Published
Refereed?: No, Open Access?: Yes
4. J. Clark, D. Demirag*, S. Moosavi*. (2020). Demystifying Stablecoins. *Communications of the ACM*. 63(7): 40-46.
Published
Refereed?: No, Open Access?: Yes
5. A. Narayanan, J. Clark. (2017). Bitcoin's Academic Pedigree. *Communications of the ACM*. 60(12): 36-45.
Published
Refereed?: Yes, Open Access?: Yes

6. Ester Moher, Jeremy Clark, Aleksander Essex,. (2014). Diffusion of voter responsibility: potential failings in E2E receipt checking. *USENIX Journal of Election Technology and Systems*. 3(1): 1-17.
Published
Refereed?: Yes, Open Access?: Yes
7. Jeremy Clark. (2014). Enhancing Anonymity: Cryptographic and statistical approaches for shredding our digital dossiers. *ACM Computing Reviews*.
Published
Refereed?: No, Open Access?: Yes

Book Chapters

1. R. Carback, D. Chaum, J. Clark, J. Conway, A. Essex, P. S. Herrnson, T. Mayberry, S. Popoveniuc, R. L. Rivest, E. Shen, A. T. Sherman, P. L. Vora. (2016). The Scantegrity Voting System and its Use in the Takoma Park Elections. *Real-World Electronic Voting: Design, Analysis and Deployment*. : Chapter 10.
Published, CRC Press
Refereed?: Yes
2. Foreword: J. Clark // Book: A. Narayanan, J. Bonneau, E. Felten, A. Miller, S. Goldfeder. (2016). Foreword: The Long Road to Bitcoin. *Bitcoin and Cryptocurrency Technologies*. : iv-xxvii.
Published, Princeton University Press
Refereed?: No

Conference Publications

1. E. Mangipudi, K. Rao, J. Clark, A. Kate. (2019). Automated Penalization of Data Leakage using Crypto-augmented Smart Contracts. *IEEE Workshop on Security & Blockchains (IEEE S&B)*,
Paper
Published
Refereed?: Yes, Invited?: No
2. S. Eskandari*, M. Moosavi*, J. Clark. (2019). Transparent Dishonesty: front-running attacks on Blockchain. *Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 11599*. Trusted Smart Contracts,
Paper
Published
Refereed?: Yes, Invited?: No
3. M. Elsheikh, J. Clark, A. Youssef. (2019). Deploying PayWord on Ethereum. *Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 11599*. Trusted Smart Contracts,
Paper
Published
Refereed?: Yes, Invited?: No
4. V. Zhao, J. Choi, D. Demirag*, M. Mannan, K. Butler, E. Ayday, J. Clark. (2019). One-time programs made practical. *LNCS 11598*. *Financial Cryptography and Data Security (FC)*,
Paper
Published
Refereed?: Yes, Invited?: No
5. M Rahimian*, S Eskandari*, J. Clark. (2019). Resolving the Multiple Withdrawal Attack in ERC20 Tokens. *IEEE Workshop on Security & Blockchains (IEEE S&B)*,
Paper
Published
Refereed?: Yes, Invited?: No

6. C. Okoye*, J. Clark. (2018). Toward Cryptocurrency Lending. Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 10958. Trusted Smart Contracts, Paper
Published
Refereed?: Yes, Invited?: No
7. S. Eskandari*, A. Leoutsarakosg*, T. Mursch, J. Clark. (2018). A first look a browser-based cryptojacking. IEEE Workshop on Security & Blockchains (IEEE S&B), Paper
Published
Refereed?: Yes, Invited?: No
8. M. Moosavi*, J. Clark. (2018). Ghazal: toward truly authoritative web certificates using Ethereum. Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 10958. Trusted Smart Contracts, Paper
Published
Refereed?: Yes, Invited?: No
9. S. Eskandari*, J. Clark, M. Adham, V. Sundaresan. (2017). On the feasibility of decentralized derivatives markets. Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 10323. Trusted Smart Contracts, Paper
Published
Refereed?: Yes, Invited?: No
10. N. Yang* and J. Clark. (2017). Practical Governmental Voting with Unconditional Integrity and Privacy. Proceedings of Financial Cryptography and Data Security: FC Workshops, LNCS 10323. Secure Voting Systems (VOTING), Paper
Published
Refereed?: Yes, Invited?: No
11. G. Dagher*, B. Bünz, J. Bonneau, J. Clark, D. Boneh. (2015). Provisions: Privacy-preserving proofs of solvency for Bitcoin exchanges. ACM Conference on Computer and Communications Security (CCS), Paper
Published
Refereed?: Yes, Invited?: No
12. Joseph Bonneau, Andrew Miller, Jeremy Clark, Arvind Narayanan, Joshua Kroll, and Edward W. Felten. (2015). Bitcoin and Second-generation Cryptocurrencies. IEEE Symposium on Security and Privacy, San Jose, United States of America
Conference Date: 2015/5
Paper
Published
Refereed?: Yes, Invited?: No
13. Shayan Eskandari, David Barrera, Elizabeth Stobert, and Jeremy Clark. (2015). A First Look at the Usability of Bitcoin Key Management. NDSS Workshop on Usable Security 2015, San Diego, Conference Date: 2015/2
Paper
Published
Refereed?: Yes, Invited?: No

14. Barrera D, McCarney D, Clark J, van Oorschot P. (2014). Baton: Future-proofing Android's Decentralized Code Signing Infrastructure. ACM Conference on Security and Privacy in Wireless and Mobile Networks, Oxford, United Kingdom
Conference Date: 2014/7
Paper
Published
Refereed?: Yes, Invited?: No
15. J. Bonneau, J. Clark, E.W. Felten, J.A. Kroll, A. Miller, A. Narayanan. (2014). On Decentralizing Prediction Markets and Order Books. Workshop on the Economics of Information Security (WEIS), State College, United States of America
Conference Date: 2014/6
Paper
Published
Refereed?: Yes, Invited?: No
16. Backes M, Clark J, Druschel P, Kate A, Simeonovski M. (2014). BackRef: Accountability in Anonymous Communication Networks. Springer LNCS 8479. Applied Cryptography and Network Security, Lausanne, Switzerland (380-400)
Conference Date: 2014/6
Paper
Published
Refereed?: Yes, Invited?: No
17. J. Bonneau, A. Narayanan, A. Miller, J. Clark, J.A. Kroll, E.W. Felten. (2014). Mixcoin: Anonymity for Bitcoin with Accountable Mixes. Springer LNCS 8437. Financial Cryptography and Data Security (FC), Barbados, Barbados (486-504)
Conference Date: 2014/3
Paper
Published
Refereed?: Yes, Invited?: No

**Curriculum Vitae
Dssouli Rachida**

Name: Dssouli Rachida,
Citizen: Canadian

Rank/ Title: Full Professor

Department/ Faculty: Concordia Institute for Information Systems Engineering (CIISE), Faculty of Engineering and Computer Science,

Institution: Concordia University

Address (W): Rachida Dssouli, Professor

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Concordia Institute for Information Systems Engineering (CIISE)

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<http://www.ciise.concordia.ca/~dssouli>

1. RESEARCH INTERESTS

Software Engineering, Communication Software Engineering, Communication Protocols and Networks, Software Quality Assurance, Service Engineering/ Computing, Conformance Testing based on Models and Timed automata, Requirement Engineering based on Scenarios, Multimedia Applications and QoS, Security Testing. Industry 4.0.

2. RESEARCH CONTRACTS & GRANTS RECEIVED

RESEARCH SUPPORT			
Family name and initial(s) of applicant	Title of proposal, funding source and program, and time commitment (hours/month)	Amount per year	Years of tenure (yyyy)
a) Support held NSERC Discovery Rachida Dssouli		20,000 (100%)	2011-2016
b) Support held Rachida Dssouli Jamal Bentahar Ghizlaine El Bousaidi Liam Peyton (PI)	AVIO-605 TEST Automation with TTCN-3 CRIAQ/ MITACS/CMC/SILKAN	240,745.00 (50%)	2014-2017
c) Support held Rachida Dssouli (PI) Jamal Bentahar (CIISE) Ghizlaine El Bousaidi (ETS) Ferhat Khendek (ECE)	AVIO-604 Specification and Verification of Design Models for Certifiable Avionics Software CRD NSERC*/ CRIAQ/ CMC/ CS Canada	59,000 (30%)* 60,000 (30%)* 60,000 (30%)* 52,500 (30%) 52,000 (30%) 52,000 (30%)	2015-2016 2016-2017 2017-2018 2015-2016 2016-2017 2017-2018
d) Support currently held NSERC Discovery Grant	Service Composition Testing and Verification	140,000 (100%)	2018-2023- 2024

3. RESEARCH CONTRIBUTIONS

3.1. BOOKS (Eds)

1. F. Belqasmi, H. Harroud, M. Agueh, **R. Dssouli**, F. Kamoun (Eds.), Emerging Technologies for Developing Countries, First International EAI Conference, AFRICATEK 2017, Marrakech, Morocco, March 27-28, Proceedings 2017, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Springer, vol. 206, 2018

3.2. REFEREED JOURNAL PUBLICATIONS

2. [Abdeladim Sadiki](#), [Jamal Bentahar](#)^{ORCID}, Rachida Dssouli, [Abdeslam En-Nouaary](#), [Hadi Otrok](#): **Deep reinforcement learning for the computation offloading in MIMO-based Edge Computing**. *Ad Hoc Networks* 141: 103080 (2023)
3. [Ikbale Taleb](#)^{ORCID}, [Mohamed Adel Serhani](#)^{ORCID}, [Chafik Bouhaddioui](#)^{ORCID}, Rachida Dssouli: **Big data quality framework: a holistic approach to continuous quality management**. *J. Big Data* 8(1): 76 (2021)
4. Mounia Elqortobi, Warda El-Khouly, Amine Rahj, Jamal Bentahar, Rachida Dssouli: Verification and testing of safety-critical airborne systems: A model-based methodology. *Comput. Sci. Inf. Syst.* 17(1): 271-292 (2020)
5. Warda El Kholly, Mohamed El-Menshawy, Jamal Bentahar, Mounia Elqortobi, Amine Laarej, Rachida Dssouli: Model checking intelligent avionics systems for test cases generation using multi-agent systems. *Expert Syst. Appl.* 156: 113458 (2020)
6. Hadeel T. El Kassabi, Mohamed Adel Serhani, Rachida Dssouli, Alramzana Nujum Navaz: Trust enforcement through self-adapting cloud workflow orchestration. *Future Generation Comp. Syst.* 97: 462-481 (2019)
7. Nader Kesserwan, Rachida Dssouli, Jamal Bentahar, Bernard Stepien, Pierre Labrèche, “From use case maps to executable test procedures: a scenario-based approach”, *Software and System Modeling* 18(2): 1543-1570 (2019)
8. H. T. El Kassabi, M. Adel Serhani, **R. Dssouli**, B. Benatallah, “A Multi-Dimensional Trust Model for Processing Big Data Over Competing Clouds”. *IEEE Access* 6: 39989-40007, 2018
9. **R. Dssouli**, A. Khoumsi, M. Elqortobi, J. Bentahar, Chapter Three - Testing the Control-Flow, Data-Flow, and Time Aspects of Communication Systems: A Survey. *Advances in Computers* 106: 95-155, 2017
10. A. S. Bataineh*, J. Bentahar, M. El-Menshawy, **R. Dssouli**, “Specifying and verifying contract-driven service compositions using commitments and model checking”. *Expert Syst. Appl.* 74: 151-184, 2017
11. W. El Kholly, J. Bentahar, M. El-Menshawy, H. Qu, **R. Dssouli**, “SMC4AC: A New Symbolic Model Checker for Intelligent Agent Communication”. *Fundam. Inform.* 152(3): 223-271, 2017
12. S. Bataineh*, J. Bentahar, M. El-Menshawy, **R. Dssouli**, “Specifying and verifying contract-driven service compositions using commitments and model checking”, *Expert Syst. Appl.* 74: 151-184, 2017
13. O. Mare*y, J. Bentahar, E. Khosrowshahi Asl, K. Sultan, **R. Dssouli**, “Decision making under subjective uncertainty in argumentation-based agent negotiation”, *J. Ambient Intelligence and Humanized Computing* 6(3): 307-323, 2015

14. M. El-Menshawy, J. Bentahar, W. El Kholy*, P. Yolum, **R. Dssouli**, “Computational logics and verification techniques of multi-agent commitments: survey”, *Knowledge Eng. Review* 30(5): 564-606 (2015) (5 Year Impact Factor 1.052)
15. S. Rabah*, M. El Barachi, N. Kara, **R. Dssouli**, J. Paquet: A Service Oriented Broker-Based Approach for Dynamic Resource Discovery in Virtual Networks, Accepted in *Journal of Cloud Computing*, SpringerOpen Journal 4:3, 2015
<http://www.journalofcloudcomputing.com/content/4/1/3>
16. W. El Kholy*, M. El-Menshawy, J. Bentahar, H. Qu, **R. Dssouli**, “Formal Specification and Automatic Verification of Conditional Commitments”, *IEEE Intelligent Systems* 30(2): 36-44 (2015) (5-Year Impact factor 2.344)
17. W. El Kholy*, Jamal Bentahar, M. El Menshawy, H. Qu, and **R. Dssouli**, “Conditional Commitments: Reasoning and Model Checking”, *ACM Trans. Softw. Eng. Methodol.* 24(2): 9:1-9:49 (2014), (Top 1 Journal in Software Engineering, 5-Year Impact Factor 1.694)
18. O. Marey*, J. Bentahar, **R. Dssouli**, M. Mbarki, “Measuring and analyzing agents' uncertainty in argumentation-based negotiation dialogue games”, *Expert Syst. Appl.* 41(2): 306-320 (2014)
19. W. El Kholy*, J. Bentahar, M. El-Menshawy, H. Qu, **R. Dssouli**, “Modeling and verifying choreographed multi-agent-based web service compositions regulated by commitment protocols”, *Expert Syst. Appl.* 41(16): 7478-7494, 2014

Book Chapters

20. **R. Dssouli**, A. Khoumsi, M. Elqortobi, J. Bentahar: Chapter Three - Testing the Control-Flow, Data-Flow, and Time Aspects of Communication Systems: A Survey. *Advances in Computers* 106: 95-155, 2017

5.6. OTHER REFEREED PUBLICATIONS

1. Mounia Elqortobi, Amine Rahj, Jamal Bentahar, Rachida Dssouli: Test Generation Tool for Modified Condition/Decision Coverage: Model Based Testing. *SITA* 2020: 38:1-38:6
2. Ikbal Taleb, Mohamed Adel Serhani, Rachida Dssouli: Big Data Quality: A Data Quality Profiling Model. *SERVICES* 2019: 61-77, 2019
3. H. T. El Kassabi*, M. Adel Serhani, R. Dssouli, N. Al-Qirim, I. Taleb*, “Cloud Workflow Resource Shortage Prediction and Fulfillment Using Multiple Adaptation Strategies”. [IEEE CLOUD 2018](#): 974-977, 2018
4. I. Taleb*, M. Adel Serhani, R. Dssouli, “Big Data Quality: A Survey”. [BigData Congress 2018](#): 166-173, 2018
5. M. Elqortobi*, W. El-Khouly, A. Rahj*, J. Bentahar, R. Dssouli, “Model-Based Verification and Testing Methodology for Safety-Critical Airborne Systems”. [MEDI Workshops 2018](#): 63-74, 2018
6. H. El-Kassabi, M. A. Serhani, C. Bouhaddioui, R. Dssouli, “Trust Assessment-Based Multiple Linear Regression for Processing Big Data over Diverse *Clouds*”, *AFRICATEK 2017*, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Springer, vol. 206, 2018

7. N. Kesserwan*, R. Dssouli, J. Bentahar “Modernization of legacy software tests to model-driven testing”, AFRICATEK 2017, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Springer, vol. 206, 2018
8. M. Elqortobi*, J. Bentahar, R. Dssouli, “Framework for Dynamic Web Services Composition Guided by Live Testing”, AFRICATEK 2017, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Springer, vol. 206, 2018
9. H. T. El Kassabi*, I. Taleb*, M. A. Serhani, R. Dssouli: Policy-Based QoS Enforcement for Adaptive Big Data Distribution on the Cloud. *BigDataService 2016*: 225-233, 2016
10. S. Rabah*, F. Belqasmi, R. Mizouni, R. Dssouli, “An Elastic Hybrid Sensing Platform: Architecture and Research Challenges”, *FNC/MobiSPC 2016*: 113-120, 2016
11. I. Taleb*, H. T. El Kassabi*, M. A. Serhani, Rachida Dssouli, C. Bouhaddioui, “Big Data Quality: A Quality Dimensions Evaluation”, *UIC/ATC/ScalCom/CBDCCom/IoP/SmartWorld 2016*: 759-765, 2016
12. W. El Kholy*, M. El-Menshawy, A. Laarej*, J. Bentahar, F. Al-Saqqar, R. Dssouli, “Real-Time Conditional Commitment Logic”, *PRIMA 2015*: 547-556, 2015
13. M. Aly*, M. El Barachi, R. Dssouli, “A new information model towards context-aware service provisioning in the Internet-of-Things”, *ICIN 2015*: 160-167, 2015
14. I. Taleb*, R. Dssouli, M. Adel Serhani, “Big Data Pre-Processing: A Quality Framework” *BigData2015, IEEE 2015 CLOUD/ICWS/BigDataCongress/SCC/MS/SERVICES*, 2015: 191-198, 2015
15. S. Behrouznia*, R. Dssouli, M. El Barachi, “A QoS based Resource Selection Approach for Virtual Networks”, published/ presented in *International Conference on Computer and Information Science and Technology 2015*, in Avestia Publishing (Open Access) University of Ottawa, Ottawa, Canada on May 11–12, 2015
16. O. Marey*, J. Bentahar, E. Khosrowshahi Asl*, M. Mbarki, R. Dssouli, “Agents' Uncertainty in Argumentation-based Negotiation: Classification and Implementation”, *ANT/SEIT 2014*: 61-68, 2014
17. W. El Kholy*, M. El Menshawy, J. Bentahar, H. Qu, and R. Dssouli, “Verifying Multiagent-based Web Service Compositions Regulated by Commitment Protocols”. In *Proceedings of the IEEE International Conference on Web Services (IEEE ICWS)*, pp. 49-56, June 27-July 2, 2014, Alaska, USA. [Acceptance rate =20%, Top Conference in Web Services]. The paper has been awarded "Best Paper". 2014
18. W. El Kholy*, M. El-Menshawy*, J. Bentahar, H. Qu, R. Dssouli, “Representing and reasoning about communicative conditional commitments”, *AAMAS 2013*: 1169-1170, 2013

4. STUDENT SUPERVISION

4.1. Ph.D. thesis completed under my supervision/co-supervision (16 graduated)

	Name	Thesis and year of graduation	Current position
1.	Nader Kesserwan	Automated Testing: Requirements Propagation via Model Transformation in Embedded Software 2020	Assistant Faculty member in USA
2.	Taleb Ikbal Dr. Serhani	Big Data Quality Management Framework, June 2019	Sharja University UAE 2019
3.	Hadeel El Kassabi Dr. Serhani	End-to-End Trust Fulfillment of Big Data Workflow Provisioning over competing clouds, November 2018	UAEU, November 2018
4.	Al-Hussaeni Khalil B. Fung	Preserving Privacy in High-Dimensional Data Publishing Concordia University	April 2017
5.	El Kholy Warda J. Bentahar	Formal Specification and Automatic Verification of Multi-Agent Conditional Commitments and their Applications, Concordia University	Assistant Professor in Egypt 2016
6.	Marey Ibrahim Omar J. Bentahar	A Framework for Argumentation-Based Agent Negotiation in Uncertain Settings Concordia University	Assistant Faculty member, Saudi Arabia 2016/ January



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This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Dr. Carol Fung

Correspondence language: English

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The primary information is denoted by (*)

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This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Protected when completed

Dr. Carol Fung

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes

Degrees

Master's Thesis, Computer Science, The University of Manitoba

Doctorate, Computer Science, University of Waterloo

Bachelor's, Computer Science, The University of Manitoba

User Profile

Research Specialization Keywords: Cybersecurity, DDoS Detection and Mitigation, Network management

Employment

2022/1	Gina Cody Research Chair in Cybersecurity and the Internet of Things CIISE, Concordia University Full-time, Associate Professor Tenure Status: Tenure
2019/6 - 2021/12	Associate professor Computer Science, Virginia Commonwealth University Full-time, Associate Professor Tenure Status: Tenure
2013/8 - 2019/5	Assistant professor Computer Science, Virginia Commonwealth University Full-time Tenure Status: Tenure Track
2012/5 - 2013/4	Research Intern Blackberry Ltd
2010/5 - 2010/8	Software Engineer intern Google Ltd

Research Funding History

Awarded [n=2]

2022/1 - 2026/12 Security and Privacy Protection Framework for IoT networks, Research Chair
Principal Investigator

Funding Sources:

Gina Cody Foundation
 Total Funding - 500,000
 Portion of Funding Received - 500,000
 Funding Competitive?: Yes

2022/1 - 2023/12
 Principal Applicant

Concordia University Startup Grant, Grant

Funding Sources:

Concordia University
 Total Funding - 50,000
 Portion of Funding Received - 50,000
 Funding Competitive?: No

Completed [n=4]

2021/8 - 2022/7
 Co-investigator

Enhancing the Privacy and Reliability of Massive-scale Bluetooth Low Energy Contact Tracing, Grant

Funding Sources:

Commonwealth Cyber Initiative
 CCI
 Total Funding - 250,000
 Portion of Funding Received - 50,000
 Funding Competitive?: Yes

2020/8 - 2021/7
 Co-investigator

User-Centric Privacy Controls for Smart Home Devices, Grant

Funding Sources:

Commonwealth Cyber Initiative
 Total Funding - 136,489
 Portion of Funding Received - 60,000
 Funding Competitive?: Yes

2019/8 - 2020/7
 Co-investigator

Human-Centric Privacy-Preserving Controls for Smart Home Devices, Grant

Funding Sources:

4-VA
 4-VA
 Total Funding - 30,000
 Portion of Funding Received - 5,000
 Funding Competitive?: Yes

2016/8 - 2017/7
 Principal Applicant

Application Security through Crowdsourcing, Grant

Funding Sources:

VCU Commercial Quest Fund
 VCU Commercial Quest Fund
 Total Funding - 26,000
 Portion of Funding Received - 26,000
 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=2]

- 2017/8 - 2019/7 Pulkit Rustigi, Virginia Commonwealth University
Principal Supervisor Thesis/Project Title: THE EVALUATION OF AN ANDROID PERMISSION MANAGEMENT SYSTEM BASED ON CROWDSOURCING
Present Position: Software engineer, Urban Company
- 2013/8 - 2016/1 Ionna Bara, Virginia Commonwealth University
Principal Supervisor Thesis/Project Title: Discovering Spam on Twitter
Present Position: Software engineer, AMD

Doctorate [n=4]

- 2022/9 - 2027/8 Rambod Pakrooh (In Progress) , Concordia University
Principal Supervisor Thesis/Project Title: TBD
Present Position: Research Assistant
- 2022/6 - 2027/5 Y A Joarder (In Progress) , Concordia University
Principal Supervisor Thesis/Project Title: TBD
Present Position: Research assistant
- 2015/8 - 2018/4 , Virginia Commonwealth University
Principal Supervisor Thesis/Project Title: Transferred to a different adviser to finish the program
Present Position: Instructor, Virginia Commonwealth University
- 2014/8 - 2018/8 , Virginia Commonwealth University
Principal Supervisor Thesis/Project Title: SMARTPHONE USER PRIVACY PRESERVING THROUGH CROWDSOURCING
Present Position: Research director at Comcast, Comcast



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Date Submitted: 2024-03-05 12:10:42

Confirmation Number: 1756209

Template: NSERC_Researcher

Dr. Mohsen Ghafouri

Correspondence language: English

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The primary information is denoted by (*)

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Montréal Quebec H3G 1M8
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Work	514-8482424 extension: 3225

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Work	ghafouri@encs.concordia.ca
Work (*)	Mohsen.Ghafouri@concordia.ca



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Dr. Mohsen Ghafouri

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	No	No	Yes	Yes
Persian	Yes	Yes	Yes	Yes	Yes

Degrees

- 2018/6 Doctorate, Electrical engineering, École Polytechnique de Montréal
Supervisors: Mahseredjian, Jean, 2014/1 - 2018/6; Karaagac, Ulas, 2014/1 - 2018/6;
Karimi, Houshang, 2014/1 - 2018/6
- 2011/7 Master's non-Thesis, Electrical engineering - Power systems, Sharif University of
Technology
Supervisors: Vakilian, Mehdi, 2009/9 - 2011/7
- 2009/9 Bachelor's, Electrical Engineering Power, Sharif University of Technology
Supervisors: Vakilian, Mehdi, 2005/9 - 2009/9

Recognitions

- 2024/3 - 2026/3 Gina Cody Research and Innovation Fellowship - 40,000
Concordia University
Prize / Award
The 40,000 CAD internal award in the area of innovation
- 2021/10 Best Paper Award
IEEE
Honor
Our paper in GUCON 2021 was selected as the best paper and got the best paper award
of the conference. It was also invited to IEEE Transactions on Industry Applications
- 2018/9 - 2019/9 Horizon postdoctoral fellowship - 48,000
Concordia University
Prize / Award
The grant was awarded by Concordia University to a set of postdoctoral applicants in
various engineering themes.

User Profile

Research Specialization Keywords: Cyber security analysis of smart grids, Renewable energies, Wind farm modeling and control, Power system modeling, Stability analysis and control of systems

Employment

- 2019/9
 Assistant Professor
 Concordia Institute for Information Systems Engineering, Engineering and Computer science, Concordia University
 Full-time, Assistant Professor
 Tenure Status: Tenure Track
 - Conducting research on the cyber security of smart grid systems - Supervising graduate and undergraduate students - Presenting graduate and undergraduate courses for Concordia Institution for Information Systems Engineering and Electrical and Computer Engineering departments - Providing community services in university and in academic societies, e.g., reviewing papers, participating in defense session of graduate students, journal editorial boards, etc. - Writing grant applications to provide financial support for students and their research
- 2018/9 - 2019/8
 Postdoc researcher
 Concordia Institute for Information Systems Engineering, Engineering and Computer science, Concordia University
 Full-time
 Tenure Status: Non Tenure Track
 - Providing help on supervising graduate students - Conducting research on various topics including the projects of NSERC/Hydro-Québec Thales Senior Industrial Research Chair in Smart Grid Security and working on self-motivated research subjects - Working on industrial projects that includes the chair projects - Publishing in the journals and conferences, particularly IEEE Transactions - Managing internal meetings with group members and presentations for industrial partners - Assisting on development of co-simulation testbed
- 2018/1 - 2018/8
 Researcher, intern
 Research and development, CYME international, Eaton power solutions
 - Development of algorithms for power system problems - Constructing theoretic foundations for the development of power system models and software packages - Working on modeling of distribution power systems and microgrid - Producing reports for placement and sizing algorithms of batteries and energy storage systems in distribution systems
- 2014/9 - 2014/12
 Teaching assistant
 Electrical engineering, Engineering and Computer science, École Polytechnique de Montréal
 Part-time, Sessional
 Tenure Status: Non Tenure Track
 - Helping course instructor to prepare the required materials for the course - Preparing Lab and computer-based assignments, tutorials, and sessions - Developing the project of the course and its evaluation
- 2012/6 - 2014/1
 Researcher
 Power system and reliability studies, NRI, Power system research institute
 - Working on the development of power system simulation software (SABA) - Working on the reliability studies and fault diagnosis of transformers on distribution and transmission systems - Reliability analysis of the distribution and transmission systems of parts of Iranian power system

Research Funding History

Awarded [n=15]

- 2022/5 - 2027/4
 Secure and resilient integration of wind energy in smart grids, Grant

Principal Applicant	<p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 142,000 Portion of Funding Received - 142,000 Funding Competitive?: Yes</p>
2021/10 - 2026/10 Co-applicant	<p>Security of Defence Products of Rheinmetall company: Evaluations and Countermeasures, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) MITACS accelerate Total Funding - 840,000 Portion of Funding Received - 210,000 Funding Competitive?: No</p> <p>Co-applicant : Cuppens, Frédéric; Cuppens-Boullahia, Nora; Majumdar, Suryadipta</p>
2024/3 - 2026/3 Principal Applicant	<p>Gina Cody Research Fellowship, Fellowship</p> <p>Funding Sources: Concordia University Gina Cody Research Fellowship Total Funding - 40,000 Portion of Funding Received - 40,000 Funding Competitive?: Yes</p>
2024/1 - 2026/1 Co-applicant	<p>Global Centers Track 2: Equitable and User-Centric Energy Market for Resilient Grid-interactive Communities, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Global Centers Track 2 Total Funding - 200,000 Portion of Funding Received - 100,000 Funding Competitive?: Yes</p> <p>Principal Applicant : Yan, Jun</p>
2021/1 - 2025/1 Co-applicant	<p>Toward Intelligent and Resilient Smart Cities with Energy-Vehicle-Human Interactions, Grant</p> <p>Funding Sources: Canada Foundation for Innovation (CFI) Purchasing equipment for research Total Funding - 1,808,543 Portion of Funding Received - 180,854 Funding Competitive?: Yes</p> <p>Co-applicant : Clark, Jeremy; Debbabi, Mourad; Lucia, Walter; Mannan, Mohammad; Mohammadi, Arash; Wang, Lingyu; Yan, Jun; Youssef, Amr;</p> <p>Principal Applicant : Assi, Chadi</p>
2021/11 - 2024/11 Co-applicant	<p>Large-Scale Integration of EVs Into the Smart Grid: A Comprehensive Cyber-Physical Study and Security Assessment, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Alliance Total Funding - 234,000</p>

Portion of Funding Received - 78,000
Funding Competitive?: No

Co-applicant : Debbabi, Mourad;

Principal Applicant : Assi, Chadi

2021/10 - 2024/10
Co-applicant

Safe Protective Relaying in Modern Transmission Systems with Massive Power
Electronic-Based Devices, Grant

Funding Sources:

Hong Kong Polytechnic University
General Research Fund for 2021/22
Total Funding - 180,000

Portion of Funding Received - 60,000
Funding Competitive?: Yes

Co-applicant : Kocar, Ilhan;

Principal Applicant : Karagaac, Ulas

2021/9 - 2024/9
Co-applicant

Security and Resiliency of Wide Area Monitoring, Protection, and Control (WAMPAC)
Systems in Smart Grids: Obstacles and Remedies, Grant

Funding Sources:

Public Safety Canada
Cyber Security Cooperation Program
Total Funding - 90,000

Portion of Funding Received - 45,000
Funding Competitive?: Yes

Principal Applicant : Ameli, Amir

2021/4 - 2023/4
Principal Applicant

Cyber Security Analysis of Wind Energy, A Subsynchronous Point of View, Grant

Funding Sources:

Fonds de recherche du Québec - Nature et technologies (FRQNT)
Établissement de la relève professorale
Total Funding - 40,000

Portion of Funding Received - 40,000
Funding Competitive?: Yes

2020/4 - 2023/4
Co-investigator

Subsynchronous Interaction Problems in Power Systems with High Penetration of Power
Electronics-Based Devices, Grant

Funding Sources:

Hong Kong Polytechnic University
General Research Fund for 2020/21
Total Funding - 1,130,000

Portion of Funding Received - 0
Funding Competitive?: Yes

Co-applicant : Kocar, Ilhan;

Principal Applicant : Karaagac, Ulas

2021/4 - 2023/4
Principal Applicant

Cyber Security Analysis of Wind Energy, A Subsynchronous Point of View: Equipment
purchase, Grant

Funding Sources:

Fonds de recherche du Québec - Nature et technologies (FRQNT)
Établissement de la relève professorale
Total Funding - 49,966

Portion of Funding Received - 49,966

2021/4 - 2023/4 Principal Applicant	<p>Funding Competitive?: Yes</p> <p>Protecting Systems of Smart Grids, Cyber Security Challenges and Opportunities, Grant</p> <p>Funding Sources: Concordia University Individual Seed Program Total Funding - 7,000 Portion of Funding Received - 7,000 Funding Competitive?: Yes</p>
2021/4 - 2023/4 Co-investigator	<p>Establishing a Cyber- Security Cluster in the City of Orillia: Analyzing, Feasibility, and Risks, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Alliance Total Funding - 50,000 Portion of Funding Received - 0 Funding Competitive?: No</p> <p>Principal Applicant : Ameli, Amir</p>
2019/9 - 2022/4 Principal Applicant	<p>Security Analysis of Renewable Energies, Grant</p> <p>Funding Sources: Concordia University Startup funds Total Funding - 50,000 Portion of Funding Received - 50,000 Funding Competitive?: No</p>
2018/9 - 2019/9 Principal Applicant	<p>Security Analysis of Microgrids, Scholarship</p> <p>Funding Sources: Concordia University Horizon Postdoctoral fellow Total Funding - 48,000 Portion of Funding Received - 48,000 Funding Competitive?: Yes</p>
Under Review [n=2]	
2024/4 - 2027/4 Co-applicant	<p>Microgrids and Their Crucial Role in Renewable Energy Integration and Cyberdefense, Grant</p> <p>Funding Sources: Fonds de recherche du Québec - Nature et technologies (FRQNT) Team grant Total Funding - 150,000 Portion of Funding Received - 150,000 Funding Competitive?: Yes</p> <p>Principal Applicant : Assi, Chadi</p>
2024/4 - 2025/4 Co-applicant	<p>Developing security metrics for EV ecosystems, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Total Funding - 45,000 Portion of Funding Received - 22,500 Funding Competitive?: Yes</p>

Principal Applicant : Assi, Chadi

Student/Postdoctoral Supervision

Master's Thesis [n=7]

2024/4 - 2026/4 Principal Supervisor	Sebtahmadi, Sina, Concordia University Thesis/Project Title: Security analysis of AC microgrids Present Position: Will start in April 2024
2023/4 - 2025/4 Principal Supervisor	Zeinab Oladi (In Progress) , Concordia University Thesis/Project Title: The security analysis of renewable energy sources Present Position: Started in April 2023
2023/1 - 2025/1 Principal Supervisor	Mirzahoseini, Mehri (In Progress) , Concordia University Thesis/Project Title: Resilient-control of wind energy systems Present Position: started in January 2023
2023/1 - 2025/1 Principal Supervisor	Mohammad pasha shabanfar (In Progress) , Concordia University Student Degree Expected Date: 2023/1 Thesis/Project Title: Security analysis of advanced metering infrastructure Present Position: starting on Jan 2023
2022/9 - 2024/9 Principal Supervisor	Babazadeh-Dizaji, Ramin (In Progress) , Concordia University Thesis/Project Title: Security analysis of microgrids Present Position: Started in Sep 2022
2021/1 - 2023/1 Principal Supervisor	Ahmadzadeh, Masoud (Completed) , Concordia University Thesis/Project Title: Anomaly detection in smart homes in the presence of distributed energy resources and electric vehicles Present Position: graduated
2020/11 - 2022/11 Co-Supervisor	Liao, Pengyi (Completed) , Concordia University Electrical and computer engineering department Thesis/Project Title: Designing platforms for cyber security analysis of distribution systems Present Position: graduated

Doctorate [n=9]

2024/4 - 2028/4 Principal Supervisor	Jiawei Dong, Concordia University Thesis/Project Title: Vulnerability analysis of EV ecosystem Present Position: Will start in April 2024
2024/1 - 2028/1 Principal Supervisor	Marandi, Saba, Concordia University Thesis/Project Title: The use of blockchain and quantum computing in security enhancement of EV ecosystem Present Position: started in January 2024
2023/9 - 2027/9 Principal Supervisor	Haghjoo, Yasaman (In Progress) , Concordia University Thesis/Project Title: Security analysis of energy storage systems Present Position: will join the group in Sep 2023
2022/9 - 2026/9 Principal Supervisor	Soleymani, Mohammad Mahdi (In Progress) , Concordia University Thesis/Project Title: Security assessment of smart grids with high penetration level of electric vehicles Present Position: Started on Sept. 2022

2022/4 - 2026/4 Principal Supervisor	Babaie Vavdareh, Masoud (In Progress) , Concordia University Thesis/Project Title: Security analysis of FACTS devices in transmission power systems Present Position: Started on Sept. 2022
2022/1 - 2026/1 Principal Supervisor	Mostafa Ansari (In Progress) , Concordia University Thesis/Project Title: Cyber security analysis of wind energy in smart grids Present Position: started in April 2022
2021/1 - 2025/1 Principal Supervisor	Zadsar, Masoud (In Progress) , Concordia University Student Degree Expected Date: 2025/1 Thesis/Project Title: Cyber security assessment of wide area monitoring systems Present Position: started on Jan. 2021, student
2021/1 - 2025/1 Principal Supervisor	Abazari, Ahmadreza (In Progress) , Concordia University Student Degree Expected Date: 2025/1 Thesis/Project Title: Modeling and analysis of cyber attacks on large-scale integration of electric vehicle in smart grids Present Position: started on Jan. 2021, student
2020/6 - 2022/8 Co-Supervisor	Lei, Meng (In Progress) , The Hong Kong Polytechnic University Student Degree Expected Date: 2022/8 Thesis/Project Title: Subsynchronous interaction problems in power systems with high penetration of power electronics-based devices Present Position: student

Event Administration

2024/5 - 2024/5	Workshop chair, International Conference On The Design Of Reliable Communication Networks 2024, Conference, 2024/5 - 2024/5
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Editorial Activities

2020/9 - 2023/9	Reviewer, IEEE Transactions on Dependable and Secure Computing, Journal
2019/9 - 2021/9	Reviewer, IEEE Transactions on Smart Grid, Journal
2019/9 - 2021/9	Reviewer, IEEE Transactions on Power Systems, Journal
2019/9 - 2021/9	Reviewer, Canadian Journal of Electrical and Computer Engineering, Journal
2019/9 - 2021/9	Reviewer, IEEE Transactions on Sustainable Energy, Journal
2020/7 - 2021/7	Guest editor, Smart Grid Communications section of Frontiers in Communications and Networks, Journal

Expert Witness Activities

2021/9 - 2022/2	Evaluator, FRQNT New Researcher Grant, the evaluation committee, Canada, montreal During this activity, I served as an evaluator in FRQNT New Researcher Grant, the evaluation committee
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Organizational Review Activities

- 2023/11 - 2024/2 Evaluator of research proposals, Fonds de recherche du Québec - Nature et technologies (FRQNT)
I am serving in a committee that evaluate the applications for FRQNT New Researchers proposals. We have received the proposals, evaluated them and discussed them in a committee
- 2021/11 - 2022/2 Evaluator of research proposals, Fonds de recherche du Québec - Nature et technologies (FRQNT)
I have served in a committee that evaluate the applications for FRQNT New Researchers proposals. We have received the proposals, evaluated them and discussed them in a committee

Knowledge and Technology Translation

- 2018/9 - 2021/9 Researcher and Postdoc fellowship, R&D Collaboration with Industry
Group/Organization/Business Served: Hydro-Quebec with Concordia University
Target Stakeholder: Utility
Outcome / Deliverable: - bi-weekly meetings - Preparing presentations - Publications and regular reports
Activity Description: - Preparing several progress report to be used by industrial partners - Presenting the outcomes of our research on presentations - Presenting the progress using bi-weekly meetings - Management of visits and on-site meetings
- 2018/9 - 2021/9 Researcher and Postdoc fellowship, R&D Collaboration with Industry
Group/Organization/Business Served: Thales Canada inc. with Concordia University
Target Stakeholder: Industry/Business (>500 employees)
Outcome / Deliverable: - bi-weekly meetings - Preparing presentations - Publications and regular reports
Activity Description: - Preparing several progress reports to be used by industrial partners - Presenting the outcomes of our research on presentations- Presenting the progress using bi-weekly meetings - Management of visits and on-site meetings
- 2014/9 - 2017/9 Researcher and PhD student, Consulting for Industry
Group/Organization/Business Served: Senvion Wind Farm manufacturer
Target Stakeholder: Industrial Association/Producer Group
Outcome / Deliverable: - Research report as part of a project defined between Hydro-Quebec, Senvion Wind Farm manufacturer, and Ecole polytechnique de Montreal
Evidence of Uptake/Impact: - The report studies the details of stability analysis of wind farm produced by Senvion and deployed in Gaspé Peninsula by Hydro-Quebec
Activity Description: The report studies the details of stability analysis of wind farm produced by Senvion and deployed in Gaspé Peninsula by Hydro-Quebec
Description: - It was one of the main deliverables of my Ph.D. program since the funding was awarded by Senvion to Polytechnique de Montreal to study the subsynchronous stability conditions of the wind turbines installed in Quebec and also propose several mitigation techniques to improve the operation of the power system and remove the risk of incidents like the one occurred in ERCOT system, Texas, 2009.

International Collaboration Activities

- 2021/5 - 2023/5 Researcher, United States of America
We joined forces with Prof. Yuhong Liu at Santa Clara University to work on the use of blockchain in the power system and its market applications

2018/6 - 2023/1 Researcher, Hong Kong
 I have collaboration with Dr. Ulas Karaggac. I worked with him when he was a research associate at Ecole polytechnique de montreal for my Ph.D. project. He joined The Hong Kong Polytechnic University as an assistant professor in June 2018. Since then, we collaborate together by applying for research grants, which one of them was successful and resulted in taking several graduate students in The Hong Kong Polytechnic University. We have also applied for several grants together and recruiting several graduate students for research purposes.

Committee Memberships

2020/4 Committee Member, Established University Research Centre with an emerging research platform, Concordia University
 The research center organizes the research activities of the security group of Concordia University and partners in the industry.

2020/3 Committee Member, Public Relations Committee (Advertising) & (Website), Concordia University

2020/3 Committee Member, Security Committee, Concordia University

2020/3 Committee Member, Supervision Committee, Concordia University

2020/3 Committee Member, Seminar Committee, Concordia University
 The seminar committee of Concordia Institute for Information Systems Engineering (CIISE) works on advancements of knowledge and technology sharing by inviting professors from around the world to present their research and have a seminar for graduate and undergraduate students to increase their knowledge and having a good idea about the current state-of-the-art in their research.

2021/6 - 2024/6 Committee Member, Council of the Gina Cody School of Engineering and Computer Science, Concordia University

Other Memberships

2014/1 Member, Institute of Electrical and Electronics Engineers (IEEE)

Presentations

1. (2023). Security of smart energy systems. IEEE International Conference on Prognostics and Health Management 2023, Montreal, Canada
 Main Audience: Researcher
 Invited?: Yes, Keynote?: Yes
2. Bhattacharya, Pratyusha; Debbabi, Mourad. (2021). The application of blockchain technology to improve the security of wide area monitoring systems. Hydro-Quebec Research Institute meeting, Canada
 Invited?: Yes, Keynote?: No
3. Karanfil, Mark; Ghafouri, Mohsen; Debbabi, Mourad. (2019). Cyber security analysis of microgrids. Research presentation, Hydro-Quebec Research institute, Varennes, Canada
 Main Audience: Researcher
 Invited?: Yes, Keynote?: No

Publications

Journal Articles

1. Ebtia, Afshin; Elhak Rebbah, Dhiaa; Ghafouri, Mohsen; Jafarigiv, Daniel; Debbabi, Mourad; Mohammadi, Arash. (2024). Spatial-Temporal Data-Driven Model for Load Altering Attack Detection in Smart Power Distribution Networks. IEEE Transactions on Industrial Informatics.
Accepted
Refereed?: Yes, Open Access?: No
2. Du, Hang; Yan, Jun; Ghafouri, Mohsen; Zgheib, Rawad; Debbabi, Mourad. (2024). Modeling and Detection of Cyber Attacks Targeting Converter-Driven Stability of Power Grids with PMSG-Based Wind Farms. IEEE Transaction on Power System.
Accepted
Refereed?: Yes, Open Access?: No
3. Zandian, Mahdi; Ameli, Amir; Ghafouri, Mohsen; Hassani, Reza; Rezaei-Zare, Afshin. (2024). A Framework to Avoid Maloperation of Transformer Differential Protection under Geomagnetic Disturbances. Transactions on Power Delivery.
Accepted
Refereed?: Yes, Open Access?: No
4. Ahmadzadeh, Masoud; Abazari, Ahmadreza; Ghafouri, Mohsen; Ameli, Amir; Muyeen, S. M. (2024). A Deep Convolutional Neural Network-Based Approach to Detect False Data Injection Attacks on PV-Integrated Distribution Systems. IEEE Access.
Published
Refereed?: Yes
5. Xue, Tao*; Karaagac, Ulas; Ghafouri, Mohsen. (2023). Impact of DFIG impedance model precision on stability analysis. Energy Reports.
Published
Refereed?: Yes, Open Access?: No
6. Sayed, MA*; Ghafouri, M; Atallah, R; Debbabi, M; Assi, Ch. (2023). Protecting the future grid: An electric vehicle robust mitigation scheme against load altering attacks on power grids. Applied Energy.
Published
Refereed?: Yes, Open Access?: No
7. Abazari, A*; Soleymani, MM*; Zadsar, M*; Ghafouri, M; Assi, Ch; Shafie-khah, M. (2023). Online Recursive Detection and Adaptive Fuzzy Mitigation of Cyber-Physical Attacks Targeting Topology of IMG: An LFC Case Study. IEEE Transaction on Smart Grid.
Published
Refereed?: Yes, Open Access?: No
8. Lei, Meng*; Karaagac, Ulas; Ghafouri, Mohsen; Stepanov, Anton; Mahseredjian, Jean. (2023). A new stationary frame multi-input multi-output EMT-level frequency scanning method for inverter based resources. Energy Reports.
Published
Refereed?: Yes
9. Ghafouri, Mohsen; Karaagac, Ulas; Mahseredjian, Jean; Kocar, Ilhan; Lei, Meng. (2023). Design of a robust and practicable SSI damping controller using H_{∞} technique for series compensated DFIG-based wind farms. Energy Reports.
Published
Refereed?: Yes

10. Asghari, M*; Ameli, A; Ghafouri, M; Kirakosyan, A;. (2023). An Optimal Cyber-Physical Attack Strategy Against DC Microgrids. International Journal of Electrical Power & Energy Systems.
Revision Requested
Refereed?: Yes, Open Access?: No
11. Zadsar, Masoud*; Ghafouri, Mohsen; Ameli, Amir; Moussa, Bassam. (2023). Preventing Time-Synchronization Attacks on Synchrophasor Measurements of Wide-Area Damping Controllers. IEEE Transactions on Instrumentation and Measurement.
Published
Refereed?: Yes, Open Access?: No
12. Karanfil, Mark *; Rebbah, Dhiaa Elhak*; Debbabi, Mourad; Kassouf, Marthe; Ghafouri, Mohsen; Hanna, Aiman. (2022). Detection of Microgrid Cyberattacks using Network and System Management. IEEE Transaction on Smart Grid.
Published
Refereed?: Yes, Open Access?: No
13. Vahidi, S*; Ghafouri, M; Au, M; Kassouf, M; mohammadi, A; Debbabi, M. (2022). Security of Wide-Area Monitoring, Protection and Control (WAMPAC) Systems: A Survey on Challenges and Opportunities. IEEE Communications Surveys and Tutorials.
Published
Refereed?: Yes, Open Access?: No
14. Abazari, Ahmadreza*; Ghafouri, Mohsen; Atallah, Ribal; Assi, Chadi. (2022). Electric Vehicle Switching Attacks Against Subsynchronous Stability of Power Systems. IEEE Transaction on Smart Grid.
Submitted
Refereed?: Yes, Open Access?: No
15. Bhattacharya, P*; Ghafouri, M; Soeanu, A; Kassouf, M; Debbabi, M. (2022). Security Enhancement of Time Synchronization and Fault Identification in WAMS Using a Two-layer Blockchain Framework. Applied Energy.
Published
Refereed?: Yes, Open Access?: No
16. Zadsar*, M; Abazari*, A; Ameli, A; Yan, J; Ghafouri, M. (2022). Prevention and Detection of Coordinated False Data Injection Attacks on Integrated Power and Gas Systems. IEEE Transaction on Power Systems.
Published
Refereed?: Yes, Open Access?: No
17. Ghafouri, M; Moussa, B; Kabir, M*; Assi, Ch. (2022). Coordinated Charging and Discharging of Electric Vehicles: A New Class of Switching Attacks. ACM Transactions on Cyber-Physical systems.
Published
Refereed?: Yes, Open Access?: No
18. Rahiminejad, A*; Ghafouri, M; Atallah, R; Lucia, W; Debbabi, M; Mohammadi A. (2022). Resilience Enhancement of Islanded Microgrid by Diversification, Reconfiguration, and DER Placement/Sizing. International Journal of Electrical Power & Energy Systems.
Published
Refereed?: Yes, Open Access?: No
19. Sarjan, Hamed; Ameli, Amir; Ghafouri, Mohsen. (2022). Cyber-Security of Industrial Internet of Things in Electric Power Systems. IEEE Access.
Published
Refereed?: Yes, Open Access?: No

20. Mohajer Hamidi, Shayan*; Ameli, Amir; Ghafouri, Mohsen. (2022). A Learning-Based Framework for Locating Faults on Power Grid Lines Based on Distortion of Travelling Waves. IEEE Transactions on instrumentation and measurement.
Published
Refereed?: Yes
21. Abazari, Ahmadreza*; Zadsar, Masoud*; Ghafouri, Mohsen; Atallah, Ribal; Assi, Chadi. (2022). A Data-mining/ANFIS and Adaptive Control for Detection and Mitigation of Attacks on DC MGs. IEEE Transactions on Smart Grids.
Published
Refereed?: Yes, Open Access?: No
22. Arzani, M*; Abazari, A*; Oshnoei, A*; Ghafouri, M; Muyeen, SM. (2021). Optimal Distribution Coefficients of Energy Resources in Frequency Stability of Hybrid Microgrids Connected to the Power System. Electronics.
Published
Refereed?: Yes, Open Access?: Yes
23. Kabir, E*; Ghafouri, M; Moussa, B; Assi, Ch. (2021). A Two-Stage Protection Method for Detection and Mitigation of Coordinated EVSE Switching Attacks. IEEE Transactions on Smart Grid.
Published
Refereed?: Yes, Open Access?: No
24. Zadsar*, M; Ansari*, M; Ameli, A; Abazari*, A; Ghafouri, M. (2021). A Two-Stage Framework for Coordination of Preventive and Corrective Resiliency Enhancement Strategies in Power and Gas Distribution Systems. International Journal of Electrical Power and Energy Systems.
Published
Refereed?: Yes, Open Access?: No
25. Ghafouri, M; Karaagac, U; Kocar, I; Xu, Z; Farantatos, E. (2021). Analysis and Mitigation of the Communication Delay Impacts on Wind Farm Central SSI Damping Controller. IEEE Access.
Published
Refereed?: Yes, Open Access?: Yes
26. Albarakati, A*; Robillard, Ch*; Karanfil, M*; Kassouf, M; Debbabi, M; Youssef, A; Ghafouri, M; Hadjidj, R. (2021). Security monitoring of IEC 61850 substations using IEC 62351-7 network and system management. IEEE Transactions on Industrial Informatics.
Published
Refereed?: Yes, Open Access?: No
27. Antoun, J*; Kabir, M*; Atallah, R; Moussa, B; Ghafouri, M; Assi, C. (2021). Assisting Residential Distribution Grids in Overcoming Large Scale EV Preconditioning Load. IEEE System Journal.
Published
Refereed?: Yes, Open Access?: No
28. Amini, A*; Ghafouri, M; Mohammadi, A; Hou, M; Asif, A; Plataniotis, K. (2021). Secure Sampled-data Observer-based Control for Wind Turbine Oscillation Under Cyber Attacks. IEEE Transactions on Smart Grid.
Accepted
Refereed?: Yes, Open Access?: No
29. Ghafouri, M; Karaagac, U; Ameli, A; Yan, J; Assi, Ch. (2021). A Cyber Attack Mitigation Scheme for Series Compensated DFIG-Based Wind Parks. IEEE Transactions on Smart Grid.
Published
Refereed?: Yes, Open Access?: No

30. Rahiminejad, A*; Plotnek, J; Atallah, R; Dubois, M A; Malatrait, D; Ghafouri, M; Mohammadi, A; Debbabi, M. (2021). A Resilience-Based Recovery Scheme for Smart Grid Restoration Following Cyberattacks to Substations. *International Journal of Electrical Power & Energy Systems*.
Published
Refereed?: Yes, Open Access?: No
31. Ameli, A; Ghafouri, M; Al-Saadany, E; Salama, M. (2021). An Auxiliary Framework to Mitigate Measurement Inaccuracies Caused by Capacitive Voltage Transformers. *IEEE Transactions on Instrumentation and Measurement*.
Published
Refereed?: Yes, Open Access?: No
32. Babaei, M*; Abazari, A*; Soleymani, M*; Ghafouri, M; Muyeen, SM; Beheshti, M. (2021). A data-mining based optimal demand response program for smart home with energy storages and electric vehicles. *Journal of Energy Storage*.
Published
Refereed?: Yes, Open Access?: No
33. Ghafouri, M; Au, M; Kassouf, M; Debbabi, M; Assi, Ch; Yan, J. (2020). Detection and Mitigation of Cyber Attacks on Voltage Stability Monitoring of Smart Grids. *IEEE Transactions on Smart Grid*.
Accepted
Refereed?: Yes, Open Access?: No
34. Ameli, A; Ghafouri, M; Zeineldin, H; Al-Saadany, E; Salama, M. (2020). Accurate Fault Diagnosis in Transformers Using an Auxiliary Current-Compensation-Based Framework for Differential Relays. *IEEE Transactions on Instrumentation and Measurement*.
Published
Refereed?: Yes, Open Access?: No
35. Abazari, A*; Soleymani, M* ;Kamwa, I; Babaei, M*; Ghafouri, M; Muyeen, M; Foley, A. (2020). A Reliable and Cost-effective Rural Area Hybrid Power System including Renewable Resources Considering Intelligent Weather Forecasting. *Energy Reports*.
Published
Refereed?: Yes, Open Access?: No
36. Abazari, A*; Soleymani, M*; Babaei, M*; Ghafouri, M; Monsef, H; Beheshti, M. (2020). High Penetrated RESs-based Adaptive Optimal Model Predictive Control (AOMPC) for Microgrid's Frequency Regulation during Weather Changes, Time-varying Parameters and Generation Unit Collapse. *IET Generation, Transmission & Distribution*.
Published
Refereed?: Yes, Open Access?: No
37. Ghafouri, M; Karaagac, U; Mahseredjian, J; Karimi, H. (2019). SSCI Damping Controller Design for Series-Compensated DFIG-Based Wind Parks Considering Implementation Challenges. *IEEE Transactions on Power Systems*. 34(4): 2644 - 2653.
Published
Refereed?: Yes, Open Access?: No
38. Akaber, P*; Moussa, B; Ghafouri, M; Atallah, R; Agba, B; Assi, Ch; Debbabi, M. (2019). CAsES: Concurrent Contingency Analysis-Based Security Metric Deployment for the Smart Grid. *IEEE Transactions on Smart Grid*. 11(3): 2676 - 2687.
Published
Refereed?: Yes, Open Access?: No
39. Ghafouri, M; Karaagac, U; Karimi, H; Mahseredjian, J. (2019). Robust subsynchronous interaction damping controller for DFIG-based wind farms. *Journal of Modern Power Systems and Clean Energy*. 7(6): 1663 - 1674.
Published
Refereed?: Yes, Open Access?: No

Book Chapters

1. Asghari, M.*; Ameli, A.; Ghafouri, M.; Uddin M. N. (2022). Application of State Observers and Filters in Protection and Cyber Security of Power Grids. Parizad, A.; Baghaee H. R.; Rahman S. Cyber Physical Power Systems: Challenges and Solutions By AI/ML, Big Data, Blockchain, IoT, And Information Theory Paradigms. : 1-70.
Submitted, IEEE Press
Refereed?: Yes
2. Riahinia, S*; Ameli, A.; Ghafouri, M.; Yassine, A. (2022). Cyber Security of Protection System in Power Grids Part 2: Case Studies on Securing Line Current Differential Relays. Alhelou H, H; Hatziargyriou, N; Dong Z. Y. Power Systems Cybersecurity. : 1-35.
Accepted, Springer
Refereed?: Yes
3. Riahinia, S*; Ameli, A, Ghafouri, M; Yassine, A. (2022). Cyber Security of Protection System in Power Grids Part 1: Vulnerabilities and Counter Measures. Alhelou H, H; Hatziargyriou, N; Dong Z. Y. Power Systems Cybersecurity. : 1-35.
Accepted, Springer
Refereed?: Yes

Conference Publications

1. Riahinia, Shahin*; Ameli, Amir; Ghafouri, Mohsen; Yassine, Abdulsalam. (2023). Recursive Least-Square-Based Parameter Estimation for Dynamic State Estimation in Power Grids. IEEE Industrial Electronics Society Annual Online Conference (ONCON),
Paper
Accepted
Refereed?: Yes, Invited?: No
2. Rahiminejad, Abolfazl; Duman, Onur; Ghafouri, Mohsen; Atallah, Ribal; Mohammadi, Arash; Debbabi, Mourad. (2023). A Resilience Quantitative Framework for Wide Area Damping Control Against Cyberattacks. 2023 IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT),
Paper
Published
Refereed?: Yes, Invited?: No
3. Babaei Vavdareh, Masoud*; Ghafouri, Mohsen; Ameli, Amir. (2023). Detection and Mitigation of False Data Injection Attacks on Wide Area Damping Controllers. IEEE Industrial Electronics Society Annual Online Conference (ONCON),
Paper
Accepted
Refereed?: Yes, Invited?: No
4. Ansari, Mostafa*; Ghafouri, Mohsen; Ameli, Amir. (2023). Cybersecurity Vulnerabilities in Phase-Locked Loop (PLL) of DFIG-Based Wind Power Plants. IEEE Industrial Electronics Society Annual Online Conference (ONCON),
Paper
Accepted
Refereed?: Yes, Invited?: No
5. Zadsar, Masoud*; Ghafouri, Mohsen; Ameli, Amir. (2023). Cyber Attack-Aware Security Hardening of Time Synchronization Technologies in WAMPAC Systems. IEEE Industrial Electronics Society Annual Online Conference (ONCON),
Paper
Accepted
Refereed?: Yes, Invited?: No

6. Rahiminejad, Abolfazl; Ghafouri, Mohsen; Atallah, Ribal; Mohammadi, Arash; Debbabi, Mourad. (2023). A Real-time Quantitative Framework for Survivability Evaluation of Smart Grids. IEEE Power & Energy Society General Meeting (PESGM),
Paper
Published
Refereed?: Yes, Invited?: No
7. Y. Li*, L. Hou, J. Yan, Y. Liu, M. Ghafouri and P. Zhang. (2023). A Two-Stage Packetized Energy Trading and Management Framework for Virtual Power Plants. IEEE Power & Energy Society General Meeting (PESGM),
Paper
Published
Refereed?: Yes, Invited?: No
8. Karanfil, Mark; Youssef, El-Nasser; Kassouf, Marthe; Debbabi, Mourad; Ghafouri, Mohsen; Hanna, Aiman. (2023). Real-time Protection Against Microgrid False Data Injection Attacks Using Passive Monitoring. 2023 IEEE Power & Energy Society General Meeting (PESGM),
Paper
Published
Refereed?: Yes, Invited?: No
9. Asghari, Mohammadmahdi *; Ameli, Amir; Ghafouri, Mohsen; Uddin, Mohammad Nasir. (2023). Unveiling a New Vulnerability in Modern Power Systems: Leveraging Publicly-Available LMPs for Crafting Cyber-Attacks. IEEE Industrial Electronics Society Annual Online Conference (ONCON),
Paper
Accepted
Refereed?: Yes, Invited?: No
10. Ansari, Mostafa; Ghafouri, Mohsen; Ameli, Amir. (2022). Cyber-Security Vulnerabilities of the Active Power Control Scheme in Large-Scale Wind-Integrated Power Systems. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No
11. Sayed, Mohammad Ali*; Ghafouri, Mohsen; Debbabi, Mourad; Assi, Chadi. (2022). Dynamic Load Altering EV Attacks Against Power Grid Frequency Control. IEEE PES General Meeting,
Paper
Accepted
Refereed?: Yes, Invited?: No
12. Du, Hang; Yan, Jun; Ghafouri, Mohsen; Zgheib, Rawad; Debbabi, Mourad. (2022). Online Attack-aware Risk Management for PMSG-based Wind Farm Depending on System Strength Evaluation. 2022 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm),
Paper
Published
Refereed?: Yes, Invited?: No
13. Babazadeh-Dizaji, Ramin; Ghaderi, Mohammad Hassan; Ghafouri, Mohsen; Hamzeh, Mohsen. (2022). A Dynamic Series Voltage Regulator for Load Protection in Bipolar DC Power System. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No

14. Sarjan, HAMED; Ameli, Ameli; Ghafouri, Mohsen. (2022). On Propagation of Cyber-Attacks in Wide-Area Measurement Systems. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No
15. Zadsar, Masoud; Ghafouri, Mohsen; Ameli, Ameli; Moussa, Bassam. (2022). Time-Synchronization Attack on Data Aggregation in Wide-Area Damping Controllers. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No
16. Li, Yuanliang; Hou, Luyang; Du, Hang; Yan, Jun; Liu, Yuhong; Ghafouri, Mohsen; Zhang, Peng. (2022). PEMT-CoSim: A Co-Simulation Platform for Packetized Energy Management and Trading in Distributed Energy Systems. 2022 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm),
Paper
Published
Refereed?: Yes, Invited?: No
17. Asghari, Mohammad Mehdi; Ameli, Amir; Ghafouri, Mohsen. (2022). On the Economic Vulnerability Analysis of Power Grids to False Data Injection Attacks against Wide Area Measurement Systems. 1st IEEE Industrial Electronics Society,
Paper
Published
Refereed?: Yes, Invited?: No
18. Abazari, Ahmadreza; Ghafouri, Mohsen; Atallah, Ribal; Assi, Chadi. (2022). Detection and Mitigation Methods of Attacks on Low-inertia Hybrid Microgrids: A Short Survey. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No
19. Abazari, Ahmadreza*; Zadsar, Zadsar*; Ghafouri, Mohsen; Assi, Chadi. (2022). Detection of Cyber-Physical Attacks Using Optimal Recursive Least Square in an Islanded Microgrid. IEEE PES General meeting,
Paper
Accepted
Refereed?: Yes, Invited?: No
20. Babaei Vavdareh, Masoud; Ghafouri, Mohsen; Ameli, Amir. (2022). A Cooperative Robust Fractional-order PID Controller for Frequency Control in Islanded Microgrids. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No
21. Ahmadzadeh, Masoud; Abazari, Ahmadreza; Ghafouri, Mohsen. (2022). Detection of FDI Attacks on Voltage Regulation of PV-Integrated Distribution Grids Using Machine Learning Methods. 2022 IEEE Electrical Power and Energy Conference (EPEC),
Paper
Published
Refereed?: Yes, Invited?: No

22. Rahiminejad, A*; Ghafouri, M; Atallah, R; Mohammadi, A; Debbabi, M. (2021). A Cyber-Physical Resilience-Based Survivability Metric against Topological Cyberattacks. Innovative Smart Grid Technologies (ISGT 2022), Washington D.C., United States of America
Paper
Accepted
Refereed?: Yes, Invited?: No
23. Zadsar, M*; Abazari, A*; Ansari, M*; Ghafouri, M; Muyeen, SM; Blaabjerg, F. (2021). Central Situational Awareness System for Resiliency Enhancement of Integrated Energy Systems. 2021 IEEE 4th International Conference on Computing, Power and Communication Technologies (GUCON),
Paper
Accepted
Refereed?: Yes, Invited?: No
24. Karanfil, M*; Rebbah, D E*; Ghafouri, M; Kassouf, M; Debbabi, M; Hanna, A. (2021). Security Monitoring of the Microgrid Using IEC 62351-7 Network and System Management. Innovative Smart Grid Technologies (ISGT 2022), Washington D.C., United States of America
Paper
Accepted
Refereed?: Yes, Invited?: No
25. Rebbah, D E*; Ebtia, A*; Ghafouri, M; Kassouf, M; Atallah, M; Debbabi, M; Mohammadi, A. (2021). Real-Time Co-simulation Platform for Security Analysis of Distribution Automation Systems. Innovative Smart Grid Technologies (ISGT 2022), Washington D.C., United States of America
Paper
Accepted
Refereed?: Yes, Invited?: No
26. Du, H*; Yan, J; Ghafouri, M; Zgheib, R; Kassouf, M; Debbabi, M. (2021). Modeling of Cyber Attacks Against Converter-Driven Stability of PMSG-Based WindFarms with Intentional Subsynchronous Resonance. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids, Aachen, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
27. Vahidi, S*; Amini, A; Ghafouri, M; Au, M; Kassouf, M; Mohammadi, A; Debbabi, M. (2021). Resilient Periodic Observer-based Control for Wide Area Oscillation Damping Against Time Synchronization Attacks. Innovative Smart Grid Technologies (ISGT 2022), Washington D.C., United States of America
Paper
Accepted
Refereed?: Yes, Invited?: No
28. Antoun, J*; Kabir, M*; Atallah, R; Moussa, B; Ghafouri, M; Assi, C. (2020). Impact Analysis of EV Preconditioning on the Residential Distribution Network. SmartGridComm 2020: IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids,
Paper
Published
Refereed?: Yes, Invited?: No
29. Duman, O*; Ghafouri, M; Kassouf, M; Atallah, R; Wang, L; Debbabi, M. (2019). Modeling Supply Chain Attacks in IEC 61850 Substations. 2019 IEEE SmartGridComm. 2019 IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No



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Date Submitted: 2023-08-06 23:05:02

Confirmation Number: 1631125

Template: NSERC_Researcher

Dr. Roch Glitho

Correspondence language: French

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The primary information is denoted by (*)

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1515 St Catherine West, EV6.227
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Canada

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Email

Work (*)	Glitho@ciise.concordia.ca
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Protected when completed

Dr. Roch Glitho

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes

Degrees

- 2002/4 Doctorate, Tele-informatics, Royal Institute of Technology
- 1990/1 Master's Thesis, Business Economics, Université des sciences sociales de Grenoble
- 1985/1 Master's Thesis, Mathematics, University of Geneva
- 1984/1 Master's Thesis, Computer Science, University of Geneva

User Profile

Research Specialization Keywords: Cloud / edge / fog computing, Hardware acceleration, Internet of Things / Tactile Internet, Network Function Virtualization (NFV), Software Defined Network (SDN)

Employment

- 2010/8 Professor and Ericsson/ENCQOR-5G Senior Industrial Research Chair
CIISE, Concordia University
Full-time, Term, Professor
Tenure Status: Tenure
- 2009/10 - 2010/7 Associate Professor
Genie Logiciel et Technologie de l'Information, École de technologie supérieure
Full-time, Term, Associate Professor
Tenure Status: Tenure Track
Teaching and Research in the broad area of Networking and Telecommunications
- 1993/7 - 2009/9 Expert
Research Department, Ericsson Canada
- 1990/5 - 1993/6 Senior Specialist
R & D Department, Ericsson Sweden
- 1986/1 - 1990/4 R&D Engineer
Hardware Development Department, Norsk Data AS Norway

Research Funding History

Awarded [n=11]

2022/4 - 2026/3 Principal Investigator	<p>Softwarized Infrastructures for Tactile Internet Applications, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Total Funding - 175,000 Portion of Funding Received - 175,000 Funding Competitive?: Yes</p>
2023/5 - 2025/4 Principal Investigator	<p>Next Generation Clouds, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) elevate Total Funding - 706,666 Portion of Funding Received - 706,666 Funding Competitive?: Yes</p>
2020/4 - 2024/3 Principal Investigator	<p>Cloud and Edge Computing for 5G and Beyond, Research Chair</p> <p>Funding Sources: Ericsson Communication Inc. Research Chair Total Funding - 914,740 Portion of Funding Received - 914,740 Funding Competitive?: Yes ENCQOR 5G Academic collaboration Total Funding - 1,293,180 Portion of Funding Received - 1,293,180 Funding Competitive?: Yes</p>
2021/4 - 2024/3 Co-applicant	<p>Efficient Algorithmic and Architectural Solutions for Tele-Surgery Type Applications in Tactile Internet, Grant</p> <p>Funding Sources: Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) Equipe Total Funding - 190,500 Portion of Funding Received - 63,500 Funding Competitive?: Yes</p>
2020/2 - 2022/2 Principal Applicant	<p>Smart Collaborative cOmputing, caching and netwoRking paradlgm for Next Generation, Grant</p> <p>Funding Sources: Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) CHIST-ERA Total Funding - 101,210 Portion of Funding Received - 101,210 Funding Competitive?: Yes</p>
2017/4 - 2021/3 Principal Investigator	<p>Applications and Service Architectures for Internet of Things, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery</p>

Total Funding - 130,000
 Portion of Funding Received - 130,000
 Funding Competitive?: Yes

2015/10 - 2020/9
 Principal Applicant End-User Service Engineering for Communications Networks, Research Chair

Funding Sources:
 Canada Research Chairs (CRC)
 Canada Research Chair - Tiers II
 Total Funding - 500,000
 Portion of Funding Received - 225,000
 Funding Competitive?: Yes

2019/4 - 2020/3
 Principal Investigator Clouds Augmented with Fogs for QoE Enabled IoT Applications, Grant

Funding Sources:
 Cisco Systems
 Collaborative Research Initiative
 Total Funding - 125,000
 Portion of Funding Received - 125,000
 Funding Competitive?: Yes

2019/4 - 2020/3
 Principal Investigator Automation of Edge Data Centers Enabled - Cloud Data Operation and Management, Grant

Funding Sources:
 Mathematics of Information Technology and Complex Systems (MITACS)
 Elevate program
 Total Funding - 130,000
 Portion of Funding Received - 130,000
 Funding Competitive?: Yes

2018/3 - 2020/2
 Principal Investigator Edge Computing for Content Delivery Networks, Grant

Funding Sources:
 Ericsson Research Canada
 CRD
 Total Funding - 50,000
 Portion of Funding Received - 50,000
 Funding Competitive?: Yes
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 CRD
 Total Funding - 30,334
 Portion of Funding Received - 30,334
 Funding Competitive?: Yes

2019/2 - 2020/1
 Principal Investigator Automating Configuration and Performance Management of Data Centers, Grant

Funding Sources:
 Mathematics of Information Technology and Complex Systems (MITACS)
 Elevate program
 Total Funding - 130,000
 Portion of Funding Received - 130,000
 Funding Competitive?: Yes

Completed [n=3]

2016/7 - 2018/6
 Principal Applicant Architectures and Algorithms for Next Generation Content Delivery Networks, Grant

Funding Sources:
 Natural Sciences and Engineering Research Council of Canada (NSERC)

NSERC CRD
 Total Funding - 130,956
 Portion of Funding Received - 130,956
 Funding Competitive?: Yes
 Ericsson Research Canada
 NSERC CRD
 Total Funding - 65,478
 Portion of Funding Received - 65,478
 Funding Competitive?: Yes

2017/3 - 2018/2
 Principal Investigator

CDN to the Home, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Total Funding - 30,000
 Portion of Funding Received - 30,000
 Funding Competitive?: Yes

2016/10 - 2017/9
 Principal Applicant

Content Delivery Networks over Dirty Slate ICN in 5G, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
 CRD
 Total Funding - 30,334
 Portion of Funding Received - 30,334
 Funding Competitive?: Yes
 Ericsson Research Canada
 CRD
 Total Funding - 50,000
 Portion of Funding Received - 50,000
 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=7]

2021/9 - 2023/8 Principal Supervisor	Farzaneh Ghassemi (In Progress) , Concordia University Student Degree Expected Date: 2023/8 Thesis/Project Title: Tactile Internet Present Position: Research assistant, Concordia University
2021/9 - 2023/8 Principal Supervisor	Zarin Tasnim (In Progress) , Concordia University Student Degree Expected Date: 2023/8 Thesis/Project Title: Tactile Internet Present Position: Research assistant, Concordia University
2020/9 - 2023/4 Principal Supervisor	Prateek Bagora (Completed) , Concordia University Thesis/Project Title: Machine Learning for Fault Management Present Position: Research assistant, Concordia University
2018/9 - 2021/6 Principal Supervisor	Jasmeen Ahluwalia (Completed) , Concordia University Thesis/Project Title: IoT Virtualization Present Position: Software developer, Ubisoft

2018/5 - 2020/7
Principal Supervisor Yassine Jebbar (Completed) , Concordia University
Thesis/Project Title: Tactile Internet
Present Position: Data Engineering Analyst, National Bank of Canada

2017/9 - 2020/6
Principal Supervisor Ferresteh Ebrahimmzad (Completed) , Concordia University
Thesis/Project Title: IoT PaaS architectures
Present Position: Cloud Engineer, PNI Digital Media LTD Vancouver

2017/5 - 2020/8
Principal Supervisor Farinaz Razouli (Completed) , Concordia University
Thesis/Project Title: Tactile Internet Algorithms
Present Position: Rsearcher, IBM Vancouver

Doctorate [n=21]

2026/5 - 2026/5
Principal Supervisor Fatemeh Ali Akbari (In Progress) , Concordia University
Student Degree Expected Date: 2025/5
Thesis/Project Title: collaborative communication caching and computing
Present Position: Research assistant, Concordia University

2022/9 - 2027/8
Principal Supervisor Khadije Shahsavand (In Progress) , Concordia University
Student Degree Expected Date: 2027/8
Thesis/Project Title: Energy Efficient 5G and beyond
Present Position: PhD student, Concordia University

2021/9 - 2025/8
Principal Supervisor Sasan Sabour (In Progress) , Concordia University
Student Degree Expected Date: 2026/8
Thesis/Project Title: Cloud and Edge Computing for 5G and Beyond
Present Position: Research assistant, Concordia University

2021/9 - 2025/8
Principal Supervisor Nafiseh Daemi (In Progress) , Concordia University
Student Degree Expected Date: 2026/8
Thesis/Project Title: Cloud and Edge Computing for 5G and Beyond
Present Position: Research assistant, Concordia University

2021/9 - 2025/8
Principal Supervisor Azadeh Azhdari (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: Cloud and Edge for 5G and Beyond
Present Position: Research assistant, Concordia University

2020/9 - 2025/9
Principal Supervisor Mahsa Raeiszadeh (In Progress) , Concordia University
Student Degree Expected Date: 2025/9
Thesis/Project Title: Data driven cloud operations
Present Position: Research assistant, Concordia University

2020/9 - 2025/9
Principal Supervisor Ahsan Saleem (In Progress) , Concordia University
Student Degree Expected Date: 2025/9
Thesis/Project Title: Real time clouds
Present Position: Research assistant, Concordia University

2020/9 - 2025/9
Principal Supervisor Hoda Sedigni (In Progress) , Concordia University
Student Degree Expected Date: 2025/9
Thesis/Project Title: Hardware acceleration
Present Position: Research assistant, Concordia University

2019/9 - 2024/9
Principal Supervisor Behshid Shayesteh (In Progress) , Concordia University
Student Degree Expected Date: 2024/9
Thesis/Project Title: Fault detection and prevention in clouds
Present Position: Research assistant, Concordia University

- 2018/5 - 2023/5
Principal Supervisor Francis Boabang (In Progress) , Concordia University
Student Degree Expected Date: 2023/5
Thesis/Project Title: Tactile Internet
Present Position: Research assistant, Concordia University
- 2018/1 - 2023/1
Principal Supervisor Razieh Abbasi (In Progress) , Concordia University
Student Degree Expected Date: 2023/1
Thesis/Project Title: Fault Management in Clouds
Present Position: Research assistant, Concordia University
- 2017/9 - 2022/5
Principal Supervisor Nattakorn Promwongsa (Completed) , Concordia University
Thesis/Project Title: Tactile Internet
Present Position: Research assistant, Concordia University
- 2017/9 - 2022/12
Principal Supervisor Negar Afrasiabi (In Progress) , Concordia University
Student Degree Expected Date: 2022/12
Thesis/Project Title: Service Function in Continuum Cloud Edge
Present Position: Research assistant, Concordia University
- 2016/8 - 2022/2
Principal Supervisor Marsa Rayani (Completed) , Concordia University
Thesis/Project Title: Information Centric Network based CDN
Present Position: Research assistant, Concordia University
- 2016/8 - 2022/2
Principal Supervisor Sepideh Malek Taji (Completed) , Concordia University
Thesis/Project Title: Machine Learning for content delivery networks
Present Position: Research assistant, Concordia University
- 2016/5 - 2023/6
Principal Supervisor Vahid Maleki Raei (Completed) , Concordia University
Thesis/Project Title: IoT Virtualization
Present Position: Research assistant, Concordia University
- 2015/1 - 2018/7
Co-Supervisor Shoreh Ahvar (Completed) , Telecom Sud Paris
Thesis/Project Title: Service Function Chaining
Present Position: Associate Professor, ISEP Paris France
- 2014/4 - 2018/12
Principal Supervisor Carla Mouradian (Completed) , Concordia University
Thesis/Project Title: IoT Architectures for large scale disaster scenarios
Present Position: Experienced Researcher, Ericsson
- 2013/1 - 2018/12
Principal Supervisor Mohammed Abu Lebdeh (Completed) , Concordia University
Thesis/Project Title: Service Architectures for 4G EPC
Present Position: Cloud Architect
- 2012/9 - 2018/12
Principal Supervisor Narjes Tahghigh (Completed) , Concordia University
Thesis/Project Title: Network Function Virtualization based - Architectures for Content Delivery Networks
Present Position: Cloud Architect, IBM
- 2012/9 - 2018/12
Principal Supervisor Abbas Soltanian (Completed) , Concordia University
Thesis/Project Title: Architectures for Cloud Based Multimedia Applications
Present Position: Cloud Architect, Genvid Technologies Inc.

Post-doctorate [n=6]

- 2021/5 - 2023/4
Principal Supervisor Amina Hentati (In Progress) , Concordia University
Student Degree Expected Date: 2023/4
Thesis/Project Title: Algorithms for IoT and Tactile Internet
Present Position: Postdoctoral student, Concordia University

2019/12 - 2022/12 Principal Supervisor	Amin Ebrahimzadeh (In Progress) , Concordia University Student Degree Expected Date: 2022/12 Thesis/Project Title: Tactile Internet Present Position: Horizon postdoctoral student, Concordia University
2019/3 - 2021/3 Principal Supervisor	Carla Mouradian (Completed) , Concordia University Thesis/Project Title: Architectures and algorithms for VNF placement Present Position: Experienced Researcher, Ericsson
2019/2 - 2021/2 Principal Supervisor	Mohammad Abu-Lebdeh (Completed) , Concordia University Thesis/Project Title: Hardware acceleration for clouds Present Position: Site reliability Engineer, Ericsson
2018/1 - 2020/1 Principal Supervisor	Somayeh Kianpisheh (Completed) , Concordia University Thesis/Project Title: Algorithms for CDN, IoT, and Tactile Internet Present Position: Postdoctoral student, Alto University, Finland
2016/2 - 2018/2 Principal Supervisor	Diala Naboulsi (Completed) , Concordia University Thesis/Project Title: Algorithms for next generation CDNs, IMS and IoT Present Position: Assistant Professor, Ecole de Technologie Superieure - ETS

Editorial Activities

2015/1 - 2025/12	Member of Advisory Board, IEEE Communications Surveys and Tutorials, Journal
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Organizational Review Activities

2022/5 - 2022/5	PhD Thesis Examiner, IMSP-UAC Republic of Benin Connecting the Unconnected: Solutions for Closing Digital Gap in Rural Areas
2022/5 - 2022/5	PhD Thesis Examiner, National Institute of Technology, Tiruchrappalli. India Latency Sensitive CPU-Intensive Task Scheduling in Fog Nodes
2021/12 - 2021/12	PhD Thesis Examiner, INSA Toulouse, France Towards a coordination-free orchestration approach to manage consistent service reconfiguration in NFV multi-domain environments
2021/3 - 2021/3	PhD Thesis Examiner, University of La Rochelle, France IoT Service Placement with Load Distribution and Service Migration in Edge Computing for 5G Networks.
2019/12 - 2019/12	PhD Thesis Examiner, Ecole Polytechnique de Montreal Title: Internet of Things Design and Deployment in Industry Candidate: Ali Mohab
2019/11 - 2019/11	PhD thesis examiner, Anna University, Gindy, India PhD thesis evaluation Title: IntelligentClassification and Structure Aware Resource Estimation for Effective Executionof Workflows in the Cloud Candidate: K. Kanagaraj
2019/10 - 2019/10	PhD Thesis Examiner, INRS, Montreal PhD thesis evaluation Title Tactile Internet over Fiber – Wireless Enhanced HetNets Using Edge Intelligence Candidate Amin Ebrahimzadeh
2019/6 - 2019/6	PhD Thesis Examiner, Anna University, Gindy, India Title: Queue Based – Resource Allocation Model for Cloud Data Centers Candidate: A, Meera

2019/3 - 2019/3	PhD Thesis Examiner, Anna University, Gindy, India PhD thesis evaluation Title: PrivacyPreservation in Online Social Networks Candidate: TShanmuigapriya
2018/12 - 2018/12	PhD Thesis Examiner, ETS Montreal PhD thesis evaluation Title Optimizing Total Cost of Ownership (TCO) for 5G Multi-Tenant Mobile BackHaul (MBH) Optical Transport Networks Candidate Nassim Haddaji
2018/5 - 2018/5	PhD Thesis Examiner, University of Montreal PhD thesis evaluation Title: Quality of Service Aware Data Dissemination in Vehicular Ad HocNetworks (VANETs) Candidate: Mehdi Sharifi Rayeni
2018/4 - 2018/4	PhD Thesis Examiner, National Institute of Technology, Tiruchrappalli. India PhD thesis evaluation Title: Detection of of HTTP Flooding Attacks inCloud Candidate: T. Raja Sree
2017/6 - 2017/6	PhD Thesis Examiner, University of Cape Town, South Africa Title: DynamicService Orchestration in the IP Multimedia Subsystem Candidate: Richard Spiers

Committee Memberships

2021/2	Committee Member, IEEE Cloud Computing Steering Committee - Advisory Board, IEEE The IEEE Cloud Steering Committee has leaders from a wide array of societies and organizations across the IEEE, all with interests in the diverse technology of cloud computing. The Steering Committee guides the activities of IEEE Cloud Computing.
2020/9 - 2023/9	Committee Member, University Research Committee, Concordia University Oversees at University level competition for and adjudication of: - internal grants - Research chairs and endowed professorships
2020/10 - 2022/4	Co-chair, Faculty Development Subcommittee of President Task Force on Black Anti-Racism, Concordia University The task force's mandate is to oversee wide-ranging anti-racism efforts across Concordia in order to help the university better serve as a diverse and welcoming place with deep connections to the community.

Text Interviews

2021/02/22	How arts, culture and technology live under the hood of next-gen cities, Montreal Gazette newspaper
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Publications

Journal Articles

1. Fatemeh Aghaaliakbari* Zakaria Ait Hmitti, Marsa Rayani, Manel Gherari, Roch H. Glitho, Halima Elbiازه, and Wessam Ajib. (2023). An Architecture for Provisioning In-Network Computing Enabled Slices for Holographic Applications in Next-Generation Networks. IEEE Communications Magazine. 61(3): 52-58.
Published
Refereed?: Yes, Open Access?: No

2. S N Afrasiabi, A Ebrahimzadeh, N Promwongsa, C Mouradian, W Li, A Recse, R Szabo, R H Glitho. (2023). Cost-efficient Cluster Migration of VNFs for Virtualized Network Function Forwarding Graph Embedding. IEEE Transactions on Network and Service Management (TNSM). Early Access
Published
Refereed?: Yes
3. S Malektaji, M Rayani, A Ebrahimzadeh, VM Raei, H Elbiaze, RH Glitho,. (2023). Dynamic Joint VNF Forwarding Graph Composition and Embedding: A Deep Reinforcement Learning Framework. IEEE Transactions on Network and Service Management (TNSM),. Early Access
Published
Refereed?: Yes, Open Access?: No
4. M Dieye, W Jaafar, H Elbiaze, R Glitho. (2023). DRL - Based Green Resource Provisioning for 5G and Beyond Networks. IEEE Transactions on Green Networking and Communications (TGCN). Early Access
Published
Refereed?: Yes, Open Access?: No
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7. N. Promwongsa, A. Ebrahimzadeh, R Glitho, N Crespi. (2022). Joint VNF Placement and Scheduling for Latency-sensitive Services. IEEE Transactions on Network Science and Engineering (TNSE). 9(4): 2432-2449.
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11. M. Rayani, A Ebrahimzadeh, R Glitho, H Elbiaze. (2021). Ensuring Profit and QoS when Dynamically Embedding Delay-Constrained ICN and IP Slices for Content Delivery. IEEE Transactions on Network Science and Engineering (TNSE). Early Access
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12. N. Promwongsa, A. Ebrahimzadeh, D. Naboulsi, S. Kianpisheh, F. Belqasmi, R. Glitho, N. Crespi, O. Alfandi,. (2021). A Comprehensive Survey of the Tactile Internet: State-of-the-art and Research Directions,. IEEE Communications Surveys and Tutorials (Impact Factor 2020: 25.249). 23(1): 472 - 523.
Published
Refereed?: Yes, Open Access?: Yes
13. S. Malek Taji, A. Ebrahimzadeh, H. Elbiaze, R. Glitho, S. Kianpisheh. (2021). An Optimization Framework for Content Migration in Edge-based Content Delivery Networks: A Deep Reinforcement Learning Approach. IEEE Transactions on Network and Service Management (TNSM) (Impact Factor 2020: 4.195).
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15. Y. Jebbar, N. Promwongsa, F Belqasmi, R Glitho. (2021). A Case Study on the Deployment of a Tactile Internet Application in a Hybrid Cloud, Edge and Mobile Ad Hoc Cloud Environment,. IEEE Systems Journal (Impact factor 2020: 3.931). Early access
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16. V Maleki Raee, A Ebrahimzadeh, R Glitho, H Elbiaze. (2021). Ensuring Energy Efficiency When Dynamically Assigning Tasks in Virtualized Wireless Sensor Networks,. IEEE Transactions on Green Networking and Communications (TGNC) (CiteScore: 8.4). Early access
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17. S. Kianpisheh and R. Glitho. (2021). Joint Admission Control and Resource Allocation with Parallel VNF Processing for Time-Constrained Chains of Virtual Network Functions. IEEE Access (Impact Factor 2020: 3.367). Early Access
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18. C. Mouradian, F. Ebrahimnezhad, Y. Jebbar, J. Ahluwalia, N.S Afrasiabi, R. Glitho, A. Moghe. (2020). An IoT Platform-as-a-Service for NFV Based –Hybrid Cloud / Fog Systems. IEEE Internet of Things (IoT) Journal (Impact Factor 2020: 9.471). 7(7): 6102 - 6115.
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19. N Promwongsa, M Abu-Lebdeh, S Kianpisheh, F. Belqasmi, R. Glitho, H Elbiaze, N Crespi, O Alfandi. (2020). Ensuring Reliability and Low Cost when using a Parallel VNF Processing to Embed Delay-Constrained Slices,. IEEE Transactions on Network and Service Management (TNSM) (Impact Factor 2020: 4.195). 17(4): 2226 - 2241.
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20. S. Malek Taji, A. Ebrahimzadeh, H. Elbiaze, R. Glitho, S. Kianpisheh,. (2020). An Optimization Framework for Content Migration in Edge-based Content Delivery Networks: A Deep Reinforcement Learning Approach. IEEE Transactions on Network and Service Management (TNSM) (Impact Factor 2020: 4.195). 18(3)
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22. F. Boabang; A. Ebrahimzadeh, R. Glitho, H. Elbiaze, M. Maier, F Belqasmi. (2020). Machine Learning Framework for Handling Delayed/Lost Packets in Tactile Internet Remote Robotic Surgery,. *EEE Transactions on Network and Service Management (TNSM)* (Impact Factor 2020: 4.195). Early Access
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23. C Mouradian, S Kianpisheh, M Abu-Lebdeh, F Ebrahimnezhad, N T Jahromi, R Glitho. (2019). Application Component Placement in NFV-based Hybrid Cloud/Fog Systems with Mobile Fog Nodes. *IEEE Journal on Selected Areas in Communications (JSAC)* (Impact Factor: 9.144). 37(5): 1130 – 1143.
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24. A. Soltanian, D Naboulsi, R Glitho, H Elbiaze. (2019). Resource Allocation Mechanism for Media Handling Services in Multimedia Conferencing,. *IEEE Journal on Selected Areas in Communications (JSAC)* (Impact Factor 2020: 9.144). 37(5): 1167 – 1181.
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25. MA Salahuddin, J Sahoo, R Glitho, H Elbiaze, W Ajib,. (2018). A Survey on Content Placement Algorithms for Cloud – Based Content Delivery Network. *IEEE Access* (Impact Factor 2020: 3.367). 6: 91 - 114.
Published
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26. C Mouradian, D Naboulsi, S Yangui, R Glitho, M J Morrow, P A Polakos. (2018). A Comprehensive Survey on Fog Computing: State-of-the-art and Research Challenges. *IEEE Communications Surveys and Tutorials* (Impact Factor 2020: 25.249). 20(1): 416 - 464.
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27. C. Mouradian, N. Tahghigh, R. Glitho. (2018). NFV and SDN based – Distributed IoT Gateway for Large-Scale Disaster Management,. *IEEE Internet of Things (IoT) Journal* (Impact Factor 2020: 9.471). 5(5): pp 4119-4131.
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Refereed?: No, Open Access?: No
28. M. Dieye, S. Ahvar, J Sahoo, E Ahvar, R Glitho, H. Elbiaze, N. Crespi. (2018). CPVNF: Cost-efficient Proactive VNF Placement and Chaining for Value-Added Services in Content Delivery Networks. *IEEE Transactions on Network and Services Management (TNSM)* (Impact Factor 2020: 4.195). 15(2): pp 774-786.
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30. M. Abu-Lebdeh, D. Naboulsi, R. Glitho and C, T Wette. (2017). On the Placement of VNF Managers in Large- Scale and Distributed NFV Systems,. *IEEE Transactions on Network and Service Management (TNSM)* (Impact Factor 2020: 4.195). 14(4): 875-889.
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Conference Publications

1. M Raeiszadeh, A Saleem, A Ebrahimzadeh, R Glitho, J Eker, R Mini. (2023). A Deep Learning Approach for Real-Time Application-Level Anomaly Detection in IoT Data Streaming. IEEE 19th Annual Consumer Communications & Networking Conference (CCNC), Las Vegas, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
2. M Saqib; H Elbiaze; R Glitho,. (2023). A Profit-aware Adaptive Approach for In-Network Traffic Classification. IEEE International Conference on Communications (ICC), Rome, Italy
Conference Date: 2023/5
Paper
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Refereed?: Yes, Invited?: No
3. B Shayesteh; C Fu; A Ebrahimzadeh and R Glitho. (2023). Causal-Temporal Analysis-based Feature Selection for Predicting Application Performance Degradation in Edge Clouds. IEEE International Conference on Communications (ICC), Italy
Conference Date: 2023/5
Paper
Accepted
Refereed?: Yes, Invited?: No
4. A Saleem, M Raeiszadeh, A Ebrahimzadeh, R Glitho. (2023). A Deep Learning Approach for Root Cause Analysis of Application Anomalies for Real-Time IIoT. Network Operations and Management Symposium (NOMS), Miami, United States of America
Conference Date: 2023/4
Paper
Published
Refereed?: Yes, Invited?: No
5. M Hammami, C Chaieb, W Ajib, H Elbiaze, R Glitho,. (2023). UAV-Assisted Wireless Networks for Stringent Applications: Resource Allocation and Positioning. IEEE Wireless Communications and Networking Conference (WCNC), Glasgow, United Kingdom
Conference Date: 2023/3
Paper
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6. H Sedighi, D Gehberger and R Glitho. (2022). Workload-aware Dynamic GPU Resource Management in Component-based Applications. 10th IEEE International Conference on Cloud Engineering (IC2E), Pacific Grove, United States of America
Paper
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Refereed?: Yes, Invited?: No

7. Soukaina Ouledsidi Ali, Halima Elbiaze, Roch Glitho, Wessam Ajib,. (2022). CaMP-INC: Components-aware Microservices Placement for In-Network Computing Cloud-Edge Continuum. IEEE Globecom, Rio de Janeiro, Brazil
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8. Aya Ahmed, Cirine Chaieb, Wessam Ajib, Halima Elbiaze and Roch Glitho. (2022). Resource Allocation and UAVs Placement in Cell-free Wireless Networks. IEEE Globecom, Brazil
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9. Muhammad Saqib, Zakaria Ait Hmitti, Halima Elbiaze. (2022). An Accurate & Efficient Approach for Traffic Classification Inside Programmable Data Plane,. IEEE Globecom 2022, Rio de Janeiro, Brazil
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Paper
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14. Razieh Abbasi Ghalehtaki, Amin Ebrahimzadeh, Roch H Glitho,. (2022). Context-Aware Feature Selection using Denoising Auto-Encoder for Fault Detection in Cloud Environments. IEEE Cloud Summit, Wshington, United States of America
Conference Date: 2022/6
Paper
Published
Refereed?: Yes, Invited?: No
15. JK Ahluwalia, C Mouradian, MN Alam, R Glitho,. (2022). Cloud Infrastructure as a Service for an Efficient Usage of Sensing and Actuation Capabilities in Internet of Things. IEEE/IFIP Network Operations and Management Symposium (NOMS), Hungary
Conference Date: 2022/4
Paper
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16. RA Ghalehtaki, A Ebrahimzadeh, F Wuhib, RH Glitho,. (2022). An Unsupervised Machine Learning-based Method for Detection and Explanation of Anomalies in Cloud Environments,. 25th Conference on Innovation in Clouds, Internet and Networks (ICIN), France
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17. VM Raee, A Ebrahimzadeh, M Rayani, R H. Glitho, M El Barachi, F Belqasmi,. (2022). Energy Efficient Virtual Network Embedding in Virtualized Wireless Sensor Networks,. IEEE 19th Annual Consumer Communications & Networking Conference (CCNC), Virtual, United States of America
Conference Date: 2022/1
Paper
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Refereed?: Yes, Invited?: No
18. A Ebrahimzadeh, M Maier, R Glitho. (2021). Trace-Driven Haptic Traffic Characterization for Tactile Internet Performance Evaluation. 7th International Conference on Engineering and Emerging Technologies,, Istanbul, Turkey
Conference Date: 2021/11
Paper
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Refereed?: Yes, Invited?: No
19. A Ebrahimzadeh, N Promwongsa, S N Afrasiabi, C Mouradian, W Li, A Recse, R Szabo and R Glitho. (2021). h-Horizon Sequential Look-ahead Greedy Algorithm for VNF-FG Embedding. 2021 IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN), Heraklion, Greece
Conference Date: 2021/11
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21. F Rasouli, A Ebrahimzadeh, S Kianpisheh, N Promwongsa, F Belqasmi, R, Glitho. (2021). PredictiveFramework for Haptic Enabled VR-based Remote Phobia Treatment in Cloud/FogEnvironment (Special Mention Award). 2021 24th Conference on Innovation in Clouds, Internet and Networks and Workshops (ICIN), Paris, France
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22. M Rayani, R Glitho, E Elbiaze. (2020). ETSI Multi-Access Edge Computing for Dynamic Adaptive Streaming inInformation Centric Networks,. IEEE Global Communications Conference (Globecom),, Taipei, Taiwan
Conference Date: 2020/12
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Refereed?: Yes, Invited?: No
23. F Boabang, R Glitho, H. Elbiaze, F Belqasmi, O. Alfandi,. (2020). A Framework forPredicting Haptic Feedback in Needle Insertion in Remote Robotic Surgery. The 17th Annual IEEE Consumer Communications & Networking Conference (CCNC 2020), Las Vegas, United States of America
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24. P Rezende, S Kianpisheh, R Glitho, E Madeira,. (2019). An SDN Based Framework for RoutingMulti-Streams Transport Traffic Over Multi Multipath Networks,. IEEE International Conference on Communications (ICC), NGNI Symposium, May 2019, Shanghai, China
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Refereed?: Yes, Invited?: No
25. R A Ghalehtaki, S Kiampiesh and R Glitho. (2019). A Bee Colony Based Algorithm forMicro Cache Placement Close to End Users in Fog Based Content DeliveryNetworks,. The 16th Annual IEEE Consumer Communications & Networking Conference (CCNC 2019), Las Vegas, United States of America
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26. S kiampisheh, and R Glitho. (2019). Cost Efficient Server Provisioning for Deadline – Constrained VNFChains: A Parallel VNF Processing Approach. The 16th Annual IEEE Consumer Communications & Networking Conference (CCNC 2019), Las Vegas, United States of America
Conference Date: 2019/1
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27. S Malektaji, D Naboulsi, R Glitho, A Polyantsev, A E Essaili, C Iskander and R Brunner,. (2019). Video Sessions KPIs ClusteringFrameworks in CDNs. The 16th Annual IEEE Consumer Communications & Networking Conference (CCNC 2019), Las Vegas, United States of America
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28. SN Afrasiabi, S Kianpisheh, C Mouradian, RH Glitho,. (2019). Application Components Migration in NFV-based Hybrid Cloud/FogSystems. IEEE International Symposium on Local and Metropolitan Area Networks (LANMAN), Paris, France
Conference Date: 2018/7
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Refereed?: Yes, Invited?: No
29. Y. Jebbar, F. Belqasmi, R. Glitho, O. Alfandi. (2018). A Fog Based – Architecture forRemote Phobia Treatment. The 11th IEEE International Conference on Cloud Computing Technology and Science (IEEE CloudCom),, Sydney, Australia
Conference Date: 2019/12
Paper
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30. N. Alam and R. Glitho. (2018). An Infrastructure as a Service for the Internet of Things. IEEE CloudNet 2018,, Tokyo, Japan
Conference Date: 2018/11
Paper
Published
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31. S. Malektaji, S. Kianpieheh and R Glitho. (2018). Purging AwareContent Placement in Fog Based – Content Delivery Networks,. IEEE CloudNet 2018, Tokyo, Japan
Conference Date: 2018/10
Poster
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Refereed?: Yes, Invited?: No
32. M. Rayani, D. Naboulsi, R. Glitho. (2018). SlicingVirtualized EPC-based 5G Core Network for Content Delivery. IEEE International Symposium on Computer Communications (ISCC), Natal, Brazil
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33. S Ahvar, J Sahoo, E Ahvar, M Dieye, R Glitho, H Elbiaze, N Crespi. (2018). PCPV:Pattern-based Cost-efficient Proactive VNF Placement and Chaining for Value-Added Services in Content Delivery Networks,. IEEE Netsoft, Montreal, Canada
Conference Date: 2018/6
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34. N. Jahromi, S. Kianpisheh, R. Glitho,. (2018). OnlineVNF Placement and Chaining for Value added Services in Content DeliveryNetworks. IEEE LANMAN, Washington, United States of America
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Paper
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35. C. Mouradian, S. Kianpisheh, R. Glitho,. (2018). Application Component Placement in NFV-based Hybrid Cloud/Fog Systems,. IEEE LANMAN 2018, United States of America
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36. S Ahvar, M Mirzaei, J Leguay, E Ahvar, A Medhat, N Crespi, R Glitho. (2018). a Simple and Effective Technique to improve costefficiency of VNF Placement and Chaining Algorithms for Network ServiceProvisioning. IEEE Netsoft, Montreal, Canada
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37. V M Raee, D Naboulsi, R Glitho. (2018). EnergyEfficient Task Assignment in Virtualized Wireless Sensor Networks,. IEEE International Symposium on Computer Communications (ISCC) 2018, Natal, Brazil
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38. M Aloui, S Yangui, H Elbiaze, R Glitho,. (2018). Analytics as aService Architecture for Cloud-based CDN: Case of Video Popularity Prediction. The 15th Annual IEEE Consumer Communications & Networking Conference (CCNC 2018), Las Vegas, United States of America
Conference Date: 2018/1
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39. C Mouradian, S Yangui, R Glitho. (2018). Robotsas-a-Service in Cloud Computing: Search and Rescue in Large-scale DisastersCase Study,. The 15th Annual IEEE Consumer Communications & Networking Conference (CCNC 2018), Las Vegas, United States of America
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40. N Taghigh;; R Glitho; A Larabi, R Brunner,. (2018). An NFV and MicroservicesBased Architecture for On-the-Fly Component Provisioning in Content DeliveryNetworks. The 15th Annual IEEE Consumer Communications & Networking Conference (CCNC 2018), Las Vegas, United States of America
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41. A Soltanian, D Naboulsi; M A Salahuddin, R Glitho; H Elbiaze;. (2018). ADS: Adaptive and Dynamic Scaling Mechanism forMultimedia Conferencing Services in the Cloud. The 15th Annual IEEE Consumer Communications & Networking Conference (CCNC 2018), Las Vegas, United States of America
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42. M. Salahuddin, A. Mseddi, H. Elbiaze, R. Glitho. (2017). Popularity and Correlation-aware Content Placement for Hierarchical Surrogates in cloud based – CDNs,. Technical Symposium on Communications Software, Services and Multimedia Applications, Globecom, Singapore, Singapore
Conference Date: 2017/12
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Refereed?: Yes, Invited?: No
43. M. Abu-Lebdeh, D. Naboulsi, R. Glitho, CW Tchouati. (2017). NFV orchestrator placement for geo-distributed systems,. 16th IEEE International Symposium on Network Computing and Applications (NCA 2017),, Cambridge, United States of America
Conference Date: 2017/11
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44. S Ahvar, H P Phyu, S M Buddhacharya, E Ahvar, R Glitho, N Crespi. (2017). CCVP: Cost efficient Centrality-based VNF Placement and Chaining Algorithm for Network Service Provisioning. 3rd IEEE Conference on Network Softwarization (NetSoft 2017),, Bologna, Italy
Conference Date: 2017/7
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Refereed?: Yes, Invited?: No
45. C Mouradian, J Sahoo, RH Glitho, MJ Morrow, PA Polakos. (2017). A Coalition Formation Algorithm for Multi-Robot Task Allocation in Large-Scale Natural Disasters. 13th IWCMC 2017 Conference, Valence, Spain
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46. N Taghig; S Yangui; A Larabi; D Smith; M A Salahuddin; R Glitho; R Brunner; H Elbiaze. (2017). NFV and SDN-based Cost-efficient and Agile Value-added Video Services Provisioning in Content Delivery Networks. The 14th Annual IEEE Consumer Communications & Networking Conference (CCNC 2017), Las Vegas, United States of America
Conference Date: 2017/1
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Refereed?: Yes, Invited?: No
47. Narjes Taghig Jahromi; Sami Yangui; Adel Larabi; Daniel Smith; Mohammad Ali Salahuddin; Roch Glitho; Richard Brunner; Halima Elbiaze,. (2017). NFV and SDN-based Cost-efficient and Agile Value added Video Services Provisioning in Content Delivery Networks. IEEE CCNC, Las Vegas, US, January 2017, Las Vegas,
Conference Date: 2017/1
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Patents

1. Orchestrator for a Virtual Platform as a Service (VNPAAS). United States of America.
Patent Status: Granted/Issued
Year Issued: 2021
Inventors: M Abu Lebdeh, R Glitho, C Tchouati
The disclosure relates to an orchestrator, for a Virtual Network Platform as a Service (VNPaaS), which orchestrates the management of a Network Service (NS). The orchestrator is operative to select an orchestration zone for each of a plurality of Virtual Network Functions (VNFs) in the NS based on selected deployment locations, where each orchestration zone comprises at least one VNF. The orchestrator is operative to associate sub-services to the selected orchestration zones, the sub-services being obtained from a decomposition of the NS into a number of sub-services equal to a number of orchestration zones selected and each sub-service comprising at least one of the plurality of VNFs. The orchestrator is operative to initiate deployment of the sub-services in the selected orchestration zones.
2. Method for VNF managers placement in large-scale and distributed NFV systems. United States of America. 11032135. 2018/07/12.
Patent Status: Granted/Issued
Year Issued: 2021
Inventors: Mohammad Abu Lebdeh Diala Naboulsi Roch Glitho Constant Wette
There is provided a network node and method for placement of virtual network functions managers (VNFMs) in a network functions virtualization (NFV) system. The method comprises determining a number of VNFMs for the NFV system, determining a type for each VNFM, determining a placement for each VNFM over distributed Network Function Virtualization Infrastructure Points of Presence (NFVI-PoPs) and determining a plurality of associations between the VNFMs and VNF instances in the system, thereby generating a VNFMs placement solution.



FORM 100A
Personal Data Form
PART I

Date
2024/01/31
Personal identification no. (PIN)
Valid 278204

Family name Hammad	Given name Amin	Initial(s) of all given names A	Personal identification no. (PIN) Valid 278204
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I hold a faculty position at an eligible Canadian college (complete Appendices B1 and C)

I do not or will not hold an academic appointment at a Canadian postsecondary institution

Place of employment other than a Canadian postsecondary Institution (give address in Appendix A)

APPOINTMENT AT A POSTSECONDARY INSTITUTION

Title of position Professor	Tenured or tenure-track academic appointment <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Part-time appointment <input checked="" type="checkbox"/> Full-time appointment <ul style="list-style-type: none"> For all non-tenured or non tenure-track academic appointment and Emeritus Professors, complete Appendices B & C For life-time Emeritus Professor and part-time positions, complete Appendix C
Department Concordia Institute for Information Systems	
Campus Sir George Williams Campus	
Canadian postsecondary institution Concordia University	

Personal information collected on this form and appendices will be stored in the Personal Information Bank for the appropriate program.

Personal identification no. (PIN)

Valid 278204

Family name

Hammad

CURRENT EMPLOYMENT

Position held (begin with current)	Organization	Department	Period (yyyy/mm to yyyy/mm)
Professor	Concordia University	Concordia Institute for Information Systems Engineering (CIISE)	2003/09

1. Most Significant Contribution

I am an internationally recognized researcher in the field of developing innovative methods based on artificial intelligence and 3D/4D modelling and simulation to improve construction processes and the operation management of constructed facilities. My vision is to transform the Architecture, Engineering, Construction, and Facilities Management (AEC/FM) industry to fully embrace the benefits of new technologies to achieve safer, more efficient, and highly automated construction sites, and more efficient operation of smart facilities. My previous research has resulted in about 300 peer-reviewed papers in top-tier journals and conferences in my research area (5400 citations according to Google Scholar). Five of my most significant contributions from the last six years are listed below. The references are available in the Common CV.

(1) Advancements in sensor-based pose estimation and tracking of construction resources

My research team and I have developed several methods for pose estimation and tracking of construction equipment using Real-time Location Systems (RTLS). The purpose is to improve safety by timely detecting potential collisions on congested sites. These methods were tested on an actual construction site in Montreal. In addition, the tracking data are used to generate workspaces for earthwork equipment to detect risks based on proximity to obstacles and the speed of movement of different parts of the equipment [C22, J32]. Furthermore, we developed a new method for near real-time simulation of earthmoving projects based on equipment tracking information [C10]. One of the applicant's Ph.D. students trained in this area was hired immediately after graduation as Assistant Professor at Twente University and has been recently offered tenure.

(2) Innovative methods in Building Information Modelling (BIM) and Construction Digital Twins

Our research in this area includes: (1) Extending the usage of BIM to physical security applications. We developed a method to optimize the type, number, and location of fixed surveillance cameras in a building using BIM-based simulation and a metaheuristic optimization method. This method is further extended to consider the movement planning of Pan-Tilt-Zoom (PTZ) cameras [J9]. (2) We have developed a new guideline for systematically defining the Level of Development (LOD) of 4D simulation based on the specific purpose of the simulation [B3, C36, C39]. This research aims to fill the knowledge gap for linking the available LODs of 3D BIM models and schedules [C51, J24, J42, J44, J55]. For example, if safety issues are to be considered in the 4D simulation, then the highest 4D-LOD Should be considered [C33, C35]. (3) We developed a roadmap for the research needed to create digital twinning of construction projects [J7, C4]. We also developed the concept of the *Construction Digital Twin*, where workers, equipment, and materials are continuously tracked using sensors and computer vision, and the collected information is processed in near real-time to update the design model and the simulation of upcoming tasks and to provide navigation guidance and safety warnings in case of potential collisions. The objective of this research is to improve the productivity and safety of heavy construction projects by integrating 4D BIM models with the managerial and operational processes of heavy construction using multi-agent systems, real-time simulation, and automated machine control. The Ph.D. student trained in this area is currently working as a senior scheduler at Hydro-Quebec, and the research approach has been implemented in the simulation of several major power plant construction projects. Another Ph.D. student trained in this area is currently working as tenure-track Associate Professor at King AbdulAziz University in Saudi Arabia.

(3) Enhancing the performance of simulation and optimization techniques

We have developed an innovative method to improve the performance of simulation-based Optimization using high-performance computing. The method has been tested in several case studies related to bridge construction projects [J56]. Furthermore, we extended this method by integrating variance reduction techniques and parallel computing [J47]. The developed model can reduce the computation time, improving the quality of optimal solutions, and increasing the confidence level in the optimality of the solutions. The model allows project planners to obtain superior optimal solutions faster, which will make the use of stochastic simulation optimization more appealing. We have also developed a method for considering the joint probability for evaluating the schedule and cost output of stochastic simulation models [J24]. This method allows for calculating the conditional probability of the project cost for a given project duration, and for finding the best project duration and cost that meet a specific joint probability. One of the applicant's Ph.D. students trained in this area is currently working as tenure-track Assistant Professor at Thomas Jefferson University.

(4) Innovative computer vision (CV) methods for construction projects

We developed several methods for detailed pose estimation of construction equipment by fusing data from stereo CV and GPS [J3]. One of the challenges in training deep learning methods is having large datasets of images. To solve this problem, we developed a method based on self-supervised methods. The benefit of these methods is that the time-consuming process of annotating the images can be automated. Furthermore, our collaborative research with a start-up company (Indus.AI) has resulted in several papers related to predicting the movements of onsite workers and equipment for enhancing safety. One of the applicant's Ph.D. students trained in this area is currently working as Senior Machine Learning Scientist at the same company, and more recently, as Senior Manager, Machine Learning at Procure. Another trained Ph.D. student became Assistant Professor, at Zhejiang University of Science and Technology. Specific contributions are: (1) Self-supervised contrastive video representation learning for construction equipment activity recognition on a limited dataset using contrastive video representation [J12]; (2) CNN-based simultaneous detection and activity classification of construction workers [J3]; (3) Automatic identification of idling reasons in excavation operations based on excavator-truck relationships [J31]; (4) Automated excavator activity recognition and productivity analysis from construction site surveillance videos [J40]; (5) Nested network for detecting personal protective equipment on large construction sites based on frame segmentation [C21]; (6) Framework for location data fusion and pose estimation of excavators using stereo vision [J54]; and (7) Skeleton estimation of excavator by detecting its parts [J61].

(5) Improving Infrastructure Lifecycle Management: Our work in this area focused on three areas. First, in municipal asset management, we developed a multi-objective framework for optimizing the maintenance plan of multiple municipal asset networks in an integrated way considering the deterioration models of different types of assets [J53, C9, C20]. Furthermore, in the planning, construction, and cost-sharing of multi-purpose utility tunnels as a smart, resilient, and sustainable solution [B4, J43]. Our contributions in this area include: (1) Street closure prediction based on the combined conditions of spatially collocated municipal Infrastructure assets at the segment level [C2, J6]; (2) Multi-criteria spatial analysis for location selection of multi-purpose utility tunnels [C24, J13, J27]; (3) Discrete event simulation of multi-purpose utility tunnels construction using microtunneling [C14]; (4) Framework for multi-purpose utility tunnel lifecycle cost assessment and cost-sharing [C48, J38],

and (5) Developing information model for multi-purpose utility tunnel lifecycle management [J4]. Another area of research is improving bridge lifecycle management by updating the Bridge Information Model using UAV-based LiDAR scanning and deep learning methods [B2, J14, J41, C8, C30, C37, C46, C56].

2. Additional Information on Contributions

Collaborations with other researchers. I have a multidisciplinary background and experience in collaboration and leading large team projects that bring together academia and industry for the development of high-quality research. My main affiliation is with Concordia Institute for Information Systems Engineering. I am also affiliated with the Department of Building, Civil and Environmental Engineering. I have university-wide collaboration with colleagues from different backgrounds in engineering, computer science, geography, urban planning, etc. My collaboration with other researchers is done through the co-supervision of graduate students when the subject of the research requires complementary expertise. In addition, I have several ongoing international collaborations in Japan, China, and Europe. For example, in 2016, I spent three months at Osaka University as Specially Appointed Professor collaborating with Prof. N. Yabuki.

2.1 Joint publications

In general, the students are listed first, and the order is based on the level of their contributions to the paper. In the case of co-supervision, the order of the co-supervisors is based on the level of their contribution to the supervision and the actual work reported in the paper. My name is last on the list of authors when I am the principal investigator of the project, reflecting my role as the supervisory authority. Almost all my publications are with my graduate students. My role in joint papers with students is to provide the initial idea behind the research and work with the students to develop the methods/algorithms/approaches to the level that they are publishable.

2.2 Selecting venues for publications

The selection of journals for publications is mainly based on the research area to reach the specific target audience and the impact factor (IF) of the journal. For example, the Journal of Automation in Construction (IF: 10.517), Advanced Engineering Informatics (IF: 7.862), Journal of Expert Systems with Applications (IF: 8.665), Tunnelling and Underground Space Technology (IF: 6.9), and ASCE Journal of Computing in Civil Engineering (IF: 5.802) are the best journals in my research area. Advanced Engineering Informatics is not limited to the area of civil engineering and construction and may have an impact on other engineering areas as well. As for the conferences, my papers are submitted to the most important conferences in my area of research, such as the IEEE Winter Simulation Conference, the Int. Conference on Computing in Civil and Building Engineering, the Construction Research Congress, and the Int. Symposium on Automation and Robotics in Construction (I am a member of the Board of Directors). I have been a member of the scientific committees of all these conferences for several years.

3. Past Contributions to HQP Training

3.1 Training environment

My training environment provides students with access to state-of-the-art hardware devices (e.g., 10 GPU high-performance computing, professional drones; wireless sensors and IoT devices; infrared, PTZ, and spherical cameras; real-time location tracking systems; 3D scanners) and software tools (e.g., simulation, optimization). They also have the unique opportunity to work closely with public and private organizations including the City of Montreal, construction owners (e.g., Hydro-Quebec), general constructors (e.g., Pomerleau), and IT and AI solution providers (e.g., Rival Solutions). This interdisciplinary, collaborative environment is a key contributor to their success in academia by using their experiences to develop new research programs, or in industry by using the skills and contacts gained from their study period to excel in their work.

3.2 HQP awards and research contributions

Over the last six years, almost all my journal and conference papers have been derived from the work of my students as first authors. Furthermore, many of my HQPs have received international (e.g., Libyan and Saudi Government Scholarships), national (e.g., the prestigious Alexander Graham Bell Canada Graduate Scholarship), provincial (e.g., Fonds de recherche du Québec–Nature et Technologies Scholarship), university-level (e.g., Concordia Entrance Fellowship) and private organization (e.g., University Foundation Pierre Arbour Scholarship) awards in recognition of their skills and contributions to the academic community. One of these students has also received Foreign Study Supplement from NSERC to spend one term at Harvard University as an exchange researcher.

Some of the awards obtained by my students are: (1) *CSCE Construction Division Moselhi Best Paper Award, 2023* (Malcolm Dunson-Todd), (2) *AACEI 3+1 Construction Elevator Pitch Competition - 2nd Place Award* (Malcolm Dunson-Todd), (3) *Second place in Construction 2050: Ideas for Future* from Construction Innovation Centre (CIC), University of Alberta, 2022 (Ali Ghelmani and Yusheng Huang), (4) *Best Paper Award in 2022, ASCE Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, (Dr. Michel Guévremont), (5) *Best Scholarly Paper/Feature/Case Study Award in 2021, ASCE Journal of Legal Affairs and Dispute Resolution in Engineering and Construction* (Dr. Michel Guévremont), (6) *First place in Prix Relève* from Centre d'expertise et de recherche en infrastructures urbaines (CERIU), 2021 (Dr. Genger Tersoo), (7) *First place in Prix Relève* from CERIU, 2019 (Yisha Luo).


4. Outcomes and skills gained by HQP

In the last 6 years, I have supervised 16 PhD and 13 MASc students. Many of them became successful faculty members. For example, Dr. Cheng Zhang is Assoc. Prof. at Xi'an Jiaotong-Liverpool University, Dr. Ali Motamedi is Full Professor at École de Technologie Supérieure, Dr. Farid Vahdatikhaki is Tenured Assistant Professor at Twente University, the Netherlands, Dr. Mohammad Mawlana is Assistant Professor at Thomas Jefferson University, and Dr. Chen Chen is Assistant Professor, Zhejiang University of Science and Technology. Others are working in industry and research in parallel. For example, Dr. Shide Salimi is Research Fellow at Harvard University, Dr. Michel Guévremont is Senior Lead Engineer at Hydro Québec, and Dr. Mohammad Soltani is Senior Manager of Machine Learning at Procore.

**APPENDIX A
Personal Data
(Form 100A)**

Complete this appendix (i) if you are an applicant or co-applicant applying for the first time; (ii) if you need to update information submitted with a previous application; or (iii) if you do not hold an appointment at a Canadian postsecondary institution. For updates, include only the revised information in addition to the date, your name and your PIN.

This information will be used by NSERC primarily to contact applicants and award holders. It may also be used to identify prospective reviewers and committee members, and to generate statistics. It will not be seen or used in the adjudication process.

			Date 2024/01/31
Family name Hammad	Given name Amin	Initial(s) of all given names A	Personal identification no. (PIN) Valid 278204
Position and complete mailing address if your primary place of employment is not a Canadian postsecondary institution or if your current mailing address is temporary			If address is temporary, indicate: Starting date Leaving date
Telephone number 1 (514) 8482424 5800	Facsimile number	E-mail address amin.hammad@concordia.ca	
Telephone number (alternate)	 Give an alternate telephone number only if you can be reached at that number during business hours.		
LANGUAGE CAPABILITY			
English	Read <input checked="" type="checkbox"/>	Write <input checked="" type="checkbox"/>	Speak <input checked="" type="checkbox"/>
French	Read <input checked="" type="checkbox"/>	Write <input checked="" type="checkbox"/>	Speak <input checked="" type="checkbox"/>
I wish to receive my correspondence:		in English <input checked="" type="checkbox"/>	in French <input type="checkbox"/>
AREA(S) OF EXPERTISE			
Provide a maximum of 10 key words that describe your area(s) of expertise. Use commas to separate them. If you have expertise with particular instruments and techniques, specify which one(s). Automation in Construction, Construction Management, Health and Safety, Applied Artificial Intelligence, Virtual and Augmented Reality, Infrastructure Management, Decision Support Systems, Digital Twins, Building Information Modeling, Modeling and Simulation			Research subject code(s) Primary 1001
			Secondary 2710

Date Submitted: 2023-09-06 00:14:49

Confirmation Number: 1646845

Template: NSERC_Researcher

Professor Amin Hammad

Correspondence language: English

Contact Information

The primary information is denoted by (*)

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Courier

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Work (*)	514-8482424 extension: 5800

Email

Work (*)	amin.hammad@concordia.ca
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Protected when completed

Professor Amin Hammad

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
Arabic	Yes	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes
Japanese	Yes	Yes	Yes	Yes	Yes

Degrees

- 1993/3 Doctorate, Civil Engineering (Computer-Aided Engineering), Nagoya University
- 1990/3 Master's Thesis, Civil Engineering, Nagoya University
- 1986/9 Bachelor's, Civil Engineering, Damascus University

Recognitions

- 2022/8 Invited Speaker at the conference "Transforming Construction with Reality Capture Technologies"
University of New Brunswick
Honor
This CSCE-sponsored conference was held in August, 2022 at University of New Brunswick
- 2018/5 Co-chair of the 7th CSCE Construction Specialty Conference jointly held with the Construction Research Congress (CRC 2019)
CSCE
Honor
The role is given by the Construction Division of the Canadian Society of Civil Engineers (CSCE)

User Profile

Research Specialization Keywords: Applied geomatics in infrastructure modeling, Building Information Modeling, Computer vision for construction safety, Construction Management, Construction Robotics, Infrastructure Management, Location-based computing, Optimizing construction resources, Simulation of construction processes, Virtual and Augmented Reality

Employment

2011/6	Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Consultation, Professor Tenure Status: Tenure
2016/7 - 2016/8	Specially Appointed Professor Division of Sustainable Energy and Environmental Engineering, Graduate School of Engineering, Osaka University Full-time, Professor Tenure Status: Non Tenure Track
2003/9 - 2011/5	Associate Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Term, Associate Professor Tenure Status: Tenure
2003/5 - 2003/8	Visiting Associate Professor Center for Spatial Information Science, Tokyo University Full-time, Term, Associate Professor Tenure Status: Non Tenure Track Research and teaching activities.
2001/6 - 2003/4	Visiting Assistant Professor Information Science and Telecommunications, University of Pittsburgh Part-time, Visiting Professorship, Assistant Professor Tenure Status: Non Tenure Track Research and teaching activities.
2001/6 - 2003/4	Visiting Scholar Civil Engineering, Carnegie-Mellon University Part-time, Term, Assistant Professor Tenure Status: Non Tenure Track Research activities.
2001/3 - 2001/5	Visiting Scholar Civil Engineering, University of Toronto Full-time, Visiting Professorship, Assistant Professor Tenure Status: Non Tenure Track Research activities.
1999/6 - 2001/2	Lecturer (rank between Assistant Professor and Associate Professor) Civil Engineering, Nagoya University Full-time, Term, Lecturer Tenure Status: Tenure Track
1997/4 - 1999/5	Principal Researcher Transportation and Urban Planning, Nagoya Industrial Science Research Institute
1993/4 - 1997/3	Assistant Professor Civil Engineering, Nagoya University Full-time, Term, Assistant Professor Tenure Status: Tenure Track
1981/1 - 1985/12	Site Engineer (part-time job for a total of 12 months) Kasiun Construction, Inc.

Research Funding History

Awarded [n=2]

2019/5 - 2025/4
Principal Investigator Cyber-Physical System Approach for Improving Productivity and Safety of Construction Projects, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery Grant
Total Funding - 310,000
Portion of Funding Received - 310,000
Funding Competitive?: Yes

2023/8 - 2024/5
Principal Applicant Developing Standard Test for Evaluating Back-Support Exoskeleton Performance for Rebar Workers, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 30,000
Portion of Funding Received - 30,000
Funding Competitive?: Yes
Co-applicant : Mazdak Nik-Bakht

Completed [n=11]

2020/2 - 2020/12
Principal Investigator Using RTLS and Computer Vision to Extend Worksite Safety, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 108,666
Portion of Funding Received - 108,666
Funding Competitive?: Yes

2018/9 - 2020/10
Principal Investigator Identification of potential areas and associated benefits of Multi-purpose Utility Tunnel (MUT) on the territory of the city Montreal, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 120,000
Portion of Funding Received - 120,000
Funding Competitive?: Yes

2018/1 - 2020/9
Co-investigator Advanced system for Heightened Situational Awareness and Risk Management in Construction Projects, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
CRD
Total Funding - 234,000
Portion of Funding Received - 100,000
Funding Competitive?: Yes

Principal Applicant : Jia Yuan Yu

2017/5 - 2019/4
Principal Applicant Faculty Research Fund for Supporting Graduate Students, Grant

Funding Sources:

Concordia University
 Faculty Research Fund
 Total Funding - 124,000
 Portion of Funding Received - 124,000
 Funding Competitive?: No

2014/4 - 2019/3
 Principal Applicant Improving Productivity and Safety of Highway Construction Projects Using Near Real-Time Simulation, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
 Discovery Grants Program
 Total Funding - 125,000
 Portion of Funding Received - 125,000
 Funding Competitive?: Yes

2018/3 - 2019/3
 Principal Applicant Aerial Inspection of Bridges and Power Industry Assets Using LiDAR Mounted on Autonomous Multi-Rotor UAV, Grant

Funding Sources:

Concordia University
 Team Accelerator
 Total Funding - 40,000
 Portion of Funding Received - 40,000
 Funding Competitive?: Yes

Co-applicant : Ashutosh Bagchi; Zhenhua Zhu

2017/1 - 2018/12
 Co-applicant Video-Based Fall Detection for Construction Workers Safety, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 Accelerate
 Total Funding - 90,000
 Portion of Funding Received - 45,000
 Funding Competitive?: Yes

Principal Investigator : Zhenhua Zhu

2018/1 - 2018/12
 Co-applicant Developing a Wireless Sensor-Based On-Site Structural Health Monitoring Platform for Buildings and Infrastructure, Grant

Funding Sources:

Concordia University
 VPRGS - Facilities Optimization
 Total Funding - 20,000
 Portion of Funding Received - 5,000
 Funding Competitive?: Yes

Co-applicant : Zhenhua Zhu;

Principal Applicant : Ashutosh Bagchi

2018/3 - 2018/9
 Co-applicant Software Tools and Equipment for Modeling, Simulation and Analysis of Industrial IoT Systems, Grant

Funding Sources:

Concordia University
 ENCS Capital Research Innovation Fund
 Total Funding - 98,581
 Portion of Funding Received - 10,000
 Funding Competitive?: Yes

Co-applicant : Abdesamad Ben Hamza; Akshay Rathore; Andrea Schiffauerova; Chun Wang; Ciprian Alecsandru; Feresteh Mafakheri; Jamal Bentahar; Jia Yuan Yu; Nadia Bhuiyan; Nizar Bouguila; Pragsen Pillay; Yong Zeng; Zhi Chen;

Principal Applicant : Anjali Awasthi

2018/3 - 2018/9
Principal Applicant Development of Semantic BIM for Supporting UAV-Based Reality Capture for Facilities Management Applications, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
Engage Program
Total Funding - 25,000
Portion of Funding Received - 25,000
Funding Competitive?: Yes

2017/4 - 2018/3
Principal Applicant Aerial Inspection of Power Industry Assets using LiDAR and Cameras Mounted on Autonomous Multi-Rotor UAV, Grant

Funding Sources:

Concordia University
VPRGS - Seed
Total Funding - 20,000
Portion of Funding Received - 15,000
Funding Competitive?: Yes

Co-applicant : Ashutosh Bagchi; Zhenhua Zhu

Under Review [n=1]

2023/11 - 2024/6
Principal Applicant Testing Occupational Exoskeleton Performance in Different Types of Construction Activities, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate Program
Total Funding - 30,000
Portion of Funding Received - 30,000
Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=13]

2023/5 - 2025/4
Principal Supervisor Hosna Ghorab (In Progress) , Concordia University
Student Degree Expected Date: 2025/4
Thesis/Project Title: Reverse Supply Chain for Modular Construction (tentative)
Present Position: MSc student, Concordia University

2022/9 - 2024/8
Co-Supervisor Dunson-Todd , Malcolm (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: *Experimental Study on the Usage of Exoskeletons in Construction (tentative)*
Present Position: MSc student, Concordia University

- 2020/9 - 2023/8
Academic Advisor Jamali, Ali (Completed) , Concordia University
Thesis/Project Title: Pavement Defect Classification and Localization Using Hybrid Weakly Supervised and Supervised Deep Learning and GIS
Present Position: Data Scientist, Rival Solutions
- 2020/1 - 2022/5
Principal Supervisor Jorjam, Shayan (Completed) , Concordia University
Thesis/Project Title: *Stochastic Simulation of Construction Methods of Multi-purpose Utility Tunnels*
Present Position: Project Manager
- 2020/1 - 2022/3
Co-Supervisor Torabi, Ghazhaleh (Completed) , Concordia University
Thesis/Project Title: Productivity Monitoring of Construction Workers Based on Spatiotemporal Activity Recognition
Present Position: Junior Computer Vision Engineer, Leav
- 2018/9 - 2020/12
Co-Supervisor Mohammad Akbarzadeh (Completed) , Concordia University
Thesis/Project Title: Enhancing Safety on Construction Sites by Detecting Personal Protective Equipment and Localizing Workers Using Computer Vision Techniques
Present Position: Software Engineer at Stratuscent
- 2018/1 - 2019/12
Principal Supervisor Yisha Luo (Completed) , Concordia University
Thesis/Project Title: Multi-Criteria Spatial Analysis of Multi-Purpose Utility Tunnels
Present Position: Engineer
- 2017/9 - 2020/12
Co-Supervisor Huang, Yusheng (Completed) , Concordia University
Thesis/Project Title: Providing Proximity Alerts to Workers on Construction Sites Using Bluetooth Low Energy RTLS
Present Position: PhD student, Concordia University
- 2017/9 - 2019/12
Principal Supervisor Majid Nasrollahi (Completed) , Concordia University
Thesis/Project Title: Automated Bridge Inspection for Concrete Surface Defect Detection Using Deep Neural Network Based on LiDAR Scanning
Present Position: Computer Vision Engineer at AIRM Consulting
- 2017/5 - 2019/4
Principal Supervisor Roya Amrollahibuki (Completed) , Concordia University
Thesis/Project Title: Modeling Construction Equipment in 4D Simulation and Application in VR Safety Training
Present Position: Engineer
- 2017/1 - 2018/12
Co-Supervisor Roshanak Eftekhari (Completed) , Concordia University
Thesis/Project Title: Improving Fire Emergency Management Using Occupant Information and BIM-Based Simulation
Present Position: Project Manager
- 2017/1 - 2019/4
Principal Supervisor Karandish, Forough (Completed) , Concordia University
Thesis/Project Title: *Evaluating the Performance of Convolutional Neural Network for Classifying Equipment on Construction Sites*
Present Position: Computer Vision Research Engineer at Huawei, Canada
- 2015/5 - 2017/8
Principal Supervisor Liu, Zheng (Completed) , Concordia University
Thesis/Project Title: Simulation of Local Climate Control in Shared Offices Based on Occupants Locations and Preferences
Present Position: Technical Sales Specialist at CertainTeed Architectural Products

Doctorate [n=16]

2021/1 - 2024/12 Academic Advisor	Huang, Yusheng (In Progress) , Concordia University Student Degree Expected Date: 2024/12 Thesis/Project Title: <i>Improving Construction Safety and Productivity Using Digital Twins (tentative)</i> Present Position: PhD student, Concordia University
2020/9 - 2024/4 Academic Advisor	Ghelmani, Ali (In Progress) , Concordia University Student Degree Expected Date: 2024/4 Thesis/Project Title: Construction Productivity Estimation Using Computer Vision Based Deep Learning (tentative) Present Position: PhD student, Concordia University
2018/9 - 2023/4 Principal Supervisor	Tersoo Genger (Completed) , Concordia University Thesis/Project Title: Framework for Multi-Purpose Utility Tunnel Location Selection Considering Social Costs Present Position: PDF, Concordia University
2017/5 - 2022/8 Principal Supervisor	Fardin Bahreini (Completed) , Concordia University Thesis/Project Title: <i>Ontological and Machine Learning Approaches for Inspection of Facilities Using BIM</i> Present Position: Engineer
2017/1 - 2021/7 Principal Supervisor	Michel Guevremont (Completed) , Concordia University Thesis/Project Title: <i>4D Simulation of Capital Construction Projects: Levels of Development and Ontology for Delay Claims Applications</i> Present Position: Senior Lead Engineer - Scheduling and 4D simulation at Hydro Québec
2017/1 - 2021/2 Co-Supervisor	Chen Chen (Completed) , Concordia University Thesis/Project Title: Computer Vision Based Automated Monitoring and Analysis of Excavation Productivity on Construction Sites Present Position: Assistant Professor, Zhejiang University of Science and Technology
2016/5 - 2021/1 Co-Supervisor	Charles Nnaemeka Igwe (Completed) , Concordia University Thesis/Project Title: A Process-Based Approach for Integrating the Last Planner System In 4D Modeling for Equipment Workspace Planning in Elevated Urban Highway Projects Present Position: Section Head, Canadian Nuclear Laboratories
2016/1 - 2020/12 Principal Supervisor	Aghbandrad, Ali (Completed) , Concordia University Thesis/Project Title: <i>Economical Analysis and Information Modeling of Multi-purpose Utility Tunnels</i> Present Position: Full Stack Web Developer, Nectar Design
2015/5 - 2022/6 Principal Supervisor	Bolourian, Neshat (Completed) , Concordia University Thesis/Project Title: <i>Point Cloud-based Deep Learning and UAV Path Planning for Surface Defect Detection of Concrete Bridges</i> Present Position: Engineer
2015/5 - 2019/12 Principal Supervisor	Salimzadeh, Negar (Completed) , Concordia University Thesis/Project Title: <i>Optimization of PV Modules Layout on High-rise Building Skins Using a BIM-based Generative Design Approach</i> Present Position: Engineer
2015/1 - 2020/4 Principal Supervisor	Arani, Seyed Amirhosain Sharif (Completed) , Concordia University Thesis/Project Title: Optimizing Energy Performance of Building Renovation Using Traditional and Machine Learning Approaches Present Position: Co-Founder and CTO, ExtergyAI

2015/1 - 2019/12 Principal Supervisor	Salimi, Shide (Completed) , Concordia University Thesis/Project Title: Simulation-Based Optimization of Energy Consumption and Occupants Comfort in Open-Plan Office Buildings Using Probabilistic Occupancy Prediction Model Present Position: Research Associate, Harvard University
2014/1 - 2021/3 Co-Supervisor	Taher, Alhussein (Completed) , Concordia University Thesis/Project Title: Computer Vision Based Automated Monitoring and Analysis of Excavation Productivity on Construction Sites Present Position: Professor at Montreal College of Information Technology
2013/9 - 2017/9 Co-Supervisor	Soltani, Mohammad (Completed) , Concordia University Thesis/Project Title: <i>Excavator Pose Estimation for Safety Monitoring by Fusing Computer Vision and RTLS Data</i> Present Position: Senior Manager, Machine Learning, Procore Technologies
2013/2 - 2017/1 Principal Supervisor	Albahri, Ameen (Completed) , Concordia University Thesis/Project Title: Simulation-Based Optimization for the Placement of Surveillance Cameras in Buildings Using BIM Present Position: Assistant Professor, King Abdul-Aziz University
2013/1 - 2018/12 Principal Supervisor	El-Ammari, Khaled (Completed) , Concordia University Thesis/Project Title: Collaborative Mixed Reality Approaches for Supporting Facilities Life Cycle Management Present Position: Lead Mixed Reality Architect, Fiction Mine

Event Administration

2023/8 - 2025/7	General Conference Chair, The International Symposium on Automation and Robotics in Construction (ISARC) 2025, Conference, 2025/7 - 2025/7
2021/11 - 2021/11	Member of the organizing and scientific committee, International Symposium of Automation and Robotic in Construction, Conference, 2021/11 - 2021/11
2018/6 - 2019/6	Co-chair of the scientific committee, 7th CSCE Construction Specialty Conference jointly held with the Construction Research Congress (CRC 2019), Laval, Canada, Conference, 2019/6 - 2019/6
2018/6 - 2019/6	Member of the scientific committee, 26 Workshop of the European Group for Intelligent Computing in Engineering, Leuven, Belgium, Conference, 2019/6 - 2019/6
2017/12 - 2018/12	Member of the scientific committee (Construction and Project Management Track), IEEE Winter Simulation Conference, 2018, Gothenburg, Sweden, Conference, 2018/12 - 2018/12
2017/10 - 2018/10	Member of the scientific committee, 35th CIB W78 2018 Conference, Chicago, Conference, 2018/10 - 2018/10
2017/7 - 2018/7	Member of the scientific committee, International Symposium on Automation and Robotics in Construction, 2018, Berlin, Germany, Conference, 2018/7 - 2018/7
2017/6 - 2018/6	Member of the scientific committee, 17th International Conference on Computing in Civil and Building Engineering, Tampere, Finland, Conference, 2018/6 - 2018/6
2017/6 - 2018/6	Member of the scientific committee, 25th Workshop of the European Group for Intelligent Computing in Engineering, Lausanne, Switzerland, Conference, 2018/6 - 2018/6
2016/12 - 2017/12	Chair of Architecture and Construction Track, IEEE Winter Simulation Conference, 2017, Las Vegas, Nevada, Conference, 2017/12 - 2017/12

2016/6 - 2017/6 Member of the technical Committee, 2017 International Workshop on Computing for Civil Engineering (IWCCE 2017), Seattle, WA, Conference, 2017/6 - 2017/6

Knowledge and Technology Translation

2017/1 - 2018/10 Researcher, R&D Collaboration with Industry
 Group/Organization/Business Served: Indus.AI (startup company)
 Target Stakeholder: Industry/Business (>500 employees)
 Outcome / Deliverable: I have been collaborating since 2017 with the personnel of Indus.AI on several research projects related to the application of computer vision and RTLS for automated data collection on construction sites.
 References / Citations / Web Sites: <https://www.indus.ai/>

International Collaboration Activities

2023/11 - 2023/11 Expert researcher, Spain
 Received grant from Ministère des Relations internationales et de la Francophonie in the scope of the cooperation program between Québec and Basque Region to conduct collaborative research project at EHU University about multi-purpose utility tunnels.

2023/9 - 2023/10 Expert panel member, United States of America
 Invited to participate in the Utilidor Value Engineering Study organized by New York City Mayor's Office of Management & Budget. I am the only panelist from outside the US.

Committee Memberships

2017/4 Committee Member, Faculty Adjudication Committee for University Research Award and Petro-Canada Young Innovator Award Nominations/Applications, Concordia University
 My role in this committee was to score the applications for several awards.

2017/3 Committee Member, Faculty Adjudication Committee for Individual Seed, Team Start-Up, and Team Accelerator applications., Concordia University
 My role in this committee was to score the applications for several awards.

2017/2 Committee Member, ENCS Faculty committees Health and Safety Committee, Concordia University

2016/1 Committee Member, Engineering and Computer Science Faculty Cluster Users Committee, Concordia University
 This committee coordinates the use of high-performance computing resources at Concordia

2014/1 - 2018/12 Committee Member, CIISE Department Tenure Committee, Concordia University

Other Memberships

2019/4 Associate Director, Concordia University
 I am the Associate Founding Director of CICIEM (Centre for Innovation in Construction & Infrastructure Engineering & Management)

2012/5 Member, Construction Research Council, American Society of Civil Engineering

2010/5 Member, Construction Division, Canadian Society for Civil Engineering

Presentations

1. (2021). Multi-purpose Utility Tunnels: Location Selection, Cost-Sharing Economical Analysis, and Information Modeling. Ney York City Under the Ground: Planning, Management, and Utilization.2 Subsurface Transformations for a Smart, Sustainable and Resilient City, Montréal, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: Yes
2. Dr. Amin Hammad, Dr. Osama Moselhi, Dr. Nenand Gucunski, Mr. Ramin Attar, Mr. Sina Karimi. <https://constructioncic.ca/event/robotics-in-construction-seminar/>. (2021). Robotics in Construction. CICIEM online seminar, Online, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No
3. Dr. Amin Hammad, Dr. Osama Moselhi, Dr. Mani Golparvar, Mr. Darren Nelson, Mr. Andy Hares. (2021). New Development of Digital Transformation of the Construction Industry. CICIEM Workshop: Digital Transformation of the Construction Industry, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: Yes

Text Interviews

- 2023/06/09 Augmented Reality, A Reality on Construction Sites (La réalité augmentée, un allié sur les chantiers), Constructo, https://www.portailconstructo.com/tendances_opportunités/realite_augmentee_allie_sur_chantiers
- 2018/05/15 En route vers le chantier intelligent (Towards the Smart Construction Site), Constructo (major Canadian magazine for the Construction industry) http://www.portailconstructo.com/infoconstructo/route_vers_chantier_intelligent
- 2018/04/09 Road closures: a prescription for prevention, Op-ed in Infrastructure edition of Ottawa's Hill Times newspaper
- 2018/03/05 L'intelligence artificielle au service de la construction (Artificial Intelligence at the Service of Construction), Le Devoir (a major newspaper in Quebec) <http://www.ledevoir.com/société/521873/l-intelligence-artificielle-au-service-de-la-construction>
- 2018/02/20 Civil engineers at Concordia devise a cost-saving solution for cities: The framework facilitates the coordination of urban road and water repairs, Concordia University News <http://www.concordia.ca/cunews/main/stories/2018/02/20/research-civil-engineers-cost-saving-solution-for-cities.html>
- 2018/01/11 Virtual reality and augmented reality: leading-edge technologies driving innovation in Montréal, Innovation Développement Montreal Newsletter <https://ville.montreal.qc.ca/idmtl/en/virtual-reality-and-augmented-reality-leading-edge->
- 2017/12/17 Champlain Bridge: 'Hoping for no winter and no wind' with one year to go, Montreal Gazette <https://montrealgazette.com/news/local-news/champlain-bridge-hoping-for-no-winter-and-no-wind-with-one-year-to-go>

Publications

Journal Articles

1. Taher, A.*, Vahdatikhaki, F., Hammad, A. (2023). Extending Earthwork Ontology to Enhance Operation Safety. Knowledge and Information Systems.
Submitted
Refereed?: Yes, Open Access?: No
2. Bahreini, F.* and Hammad, A. (2023). Dynamic Graph CNN Based Semantic Segmentation of Concrete Defects and As-Inspected Modeling.Automation in Construction.
Revision Requested
Refereed?: Yes, Open Access?: No
3. Torabi, G.*, Hammad, A., Bouguila, N. (2023). Two-Dimensional and Three-Dimensional CNN-Based Simultaneous Detection and Activity Classification of Construction Workers. Journal of Computing in Civil Engineering.
Published
Refereed?: Yes, Open Access?: No
4. Alaghbandrad, A.* and Hammad, A. (2023). Framework of Multi-purpose Utility Tunnel Information Modeling for Lifecycle Management. Advanced Engineering Informatics.
Submitted
Refereed?: Yes, Open Access?: No
5. Liu, Z.*, Salimi, S.*, and Hammad, A. (2023). Sensitivity Analysis of Local Climate Control in Shared Offices Based on Occupants Locations. Sustainable Cities and Society.
Submitted
Refereed?: Yes, Open Access?: No
6. Genger, T.K.* and Hammad, A. (2023). Street Closure Prediction Based on the Combined Conditions of Spatially Collocated Municipal Infrastructure Assets at the Segment Level. Expert Systems with Applications. 219(119671)
Published
Refereed?: Yes, Open Access?: No
7. Yusheng Huang, Y., Hammad, A., Torabic, G., Ghelmani, A., and Guévremont, M. (2023). Digital Twins of Construction Sites: Critical Review and Roadmap. Automation in Construction.
Submitted
Refereed?: Yes, Open Access?: No
8. Jroram, S.* and Hammad, A. (2023). Stochastic Simulation of Construction Methods of Multi-purpose Utility Tunnels. Tunnelling and Underground Space Technology.
Submitted
Refereed?: Yes, Open Access?: No
9. Albahri, A.* and Hammad, A. (2023). Simulation-Based Optimization of PTZ Camera Placement and Movement Plan in Buildings Using BIM. Journal of Automation in Construction.
Submitted
Refereed?: Yes, Open Access?: No
10. Vahdatikhaki, F., Barus, M.V., Shen, O., Voordijk, H. and Hammad, A. (2023). Surrogate Modelling of Solar Radiation Potential for the Design of PV Module Layout on Entire Façade of Tall Buildings. Energy & Buildings. 286(112958)
Published
Refereed?: Yes, Open Access?: No

11. Ghelmani, A. and Hammad, A. (2023). Improving Single-Stage Activity Recognition of Excavators Using Knowledge Distillation of Temporal Gradient Data. *Journal of Automation in Construction*.
Submitted
Refereed?: Yes, Open Access?: No
12. Ghelmani, A., and Hammad, A. (2023). Self-supervised contrastive video representation learning for construction equipment activity recognition on limited dataset. *Automation in Construction*. 154(105001)
Published
Refereed?: Yes, Open Access?: No
13. Genger, K.T., Hammad, A., Oum, N. (2023). Multi-objective optimization for selecting potential locations of multi-purpose utility tunnels considering agency and social lifecycle costs. *Tunnelling and Underground Space Technology*. 140(105305)
Published
Refereed?: Yes, Open Access?: No
14. Bolourian, N.*, Hammad, A. (2023). Point Cloud-based Concrete Surface Defect Semantic Segmentation. *ASCE Computing in Civil Engineering*. 37(2)
Published
Refereed?: Yes, Open Access?: No
15. Huang, Y. and Hammad, A. (2023). Simulation-based Optimization of Path Planning for Camera-equipped UAV Considering Construction Activities. *Automation in Construction*.
Submitted
Refereed?: Yes, Open Access?: No
16. Bahreini, F.*, Hammad, A. (2022). Ontology for BIM-based Robotic Navigation and Inspection Tasks. *Building Engineering*.
Revision Requested
Refereed?: Yes, Open Access?: No
17. Huang, H.*, Ye, Z., Zhang, C., Yue, Y., Cui, C., and Hammad, A. (2022). Adaptive Cloud-to-Cloud (AC2C) Comparison Method for Photogrammetric Point Cloud Error Estimation Considering Theoretical Error Space. *Remote Sensing*. 14(17)
Published
Refereed?: Yes, Open Access?: No
18. Taher, A.*, Vahdatikhaki, F., Hammad, A. (2022). Formalizing knowledge representation in earthwork operations through development of domain ontology. *Journal of Engineering, Construction and Architectural Management*. 29(6)
Published
Refereed?: Yes, Open Access?: No
19. Soliman, A., Hafeez, G., Erkmen, E., Ganesan, R., Ouf, M., Hammad, A., Eicker, U., and Moselhi, O. (2022). Innovative construction material technologies for sustainable and resilient civil infrastructure. *Proceedings of Materials Today*. 60(1): 365-372.
Published
Refereed?: Yes
20. Igwe, C.*, Nasiri, F., Hammad, A. (2022). Construction workspace management: critical review and roadmap. *International Journal of Construction Management*. 22(10): 1960-1973.
Published
Refereed?: Yes, Open Access?: No
21. Akbarzadeh, M.*, Zhu, Z., Hammad, A. (2022). Nested Network Based on Frame Segmentation for Far-Field PPE Detection and Safety Reports Generation from Two Camera Views. *Engineering, Construction and Architectural Management*.
Revision Requested
Refereed?: Yes, Open Access?: No

22. Vahdatikhaki, F., Salimzadeh, N.*, and Hammad, A. (2022). Optimization of PV modules layout on high-rise building skins using a BIM-based generative design approach. *Energy and Buildings*. 258(111787)
Published
Refereed?: Yes, Open Access?: No
23. Chen, Z., Feng, Q., Yue, R., Chen, Z., Moselhi, O., Soliman, A., Hammad, A., An, C. (2022). Construction, renovation, and demolition waste in landfill: a review of waste characteristics, environmental impacts, and mitigation measures. *Journal of Environmental Science and Pollution Research*. 29: 46509–46526.
Published
Refereed?: Yes, Open Access?: No
24. Guevremont, M.* and Hammad, A. (2021). Ontology for linking delay claims with 4D simulation to analyze Effects-Causes and Responsibilities. *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*. 13(4)
Published
Refereed?: Yes, Open Access?: No
25. Pazhoohesh, M., Zhang, C., Hammad, A., Taromi, Z., Razmjoo, A. (2021). Infrared thermography for a quick construction progress monitoring approach in concrete structures. *Architecture, Structures and Construction*. 1(2): 91-106.
Published
Refereed?: Yes, Open Access?: No
26. Igwe, C.*, Nasiri, F., Hammad, A. (2021). Multi-Criteria Decision-Making Method for Selecting Scheduling Technique in Elevated Urban Highway Projects. *International Journal of Construction Project Management*. 13(1): 3-21.
Published
Refereed?: Yes, Open Access?: No
27. Genger, T.K.*, Luo, Y.*, Hammad, A. (2021). Multi-Criteria Spatial Analysis for Location Selection of Multi-Purpose Utility Tunnels. *Tunnelling and Underground Space Technology*. 115(104073)
Published
Refereed?: Yes, Open Access?: No
28. Sharif, A.S.*, Hammad, A., and Eshraghi, P. (2021). Generation of whole building renovation scenarios using variational autoencoders. *Energy and Buildings*. 230(110520)
Published
Refereed?: Yes, Open Access?: No
29. Chen, C.*, Zhu, Z., Hammad, A. (2021). Critical review and road map of automated methods for earthmoving equipment productivity monitoring. *ASCE Journal of Computing in Civil Engineering*. 36(3)
Published
Refereed?: Yes, Open Access?: No
30. Acosta, P.M., Vahdatikhaki, F., Santos, J., Hammad, A., Dorée, A. (2021). How to bring UHI to the urban planning table? A data-driven modeling approach. *Sustainable Cities and Society*. 71(102948)
Published
Refereed?: Yes
31. Chen, C.*, Zhu, Z., Hammad, A., Akbarzadeh, M.*. (2021). Automatic Identification of Idling Reasons in Excavation Operations Based on Excavator–Truck Relationships. *Journal of Computing in Civil Engineering*. 35(5)
Published
Refereed?: Yes, Open Access?: No
32. Huang, Y.*, Hammad, A., Zhu, Z. (2021). Providing Proximity Alerts to Workers on Construction Sites Using Bluetooth Low Energy RTLS. *Automation in Construction*. 132(103928)
Revision Requested
Refereed?: Yes, Open Access?: No

33. Igwe, C.*, Nasiri, F., Hammad, A. (2021). Empirical Study on Non-Physical Waste Factors in the Construction Industry. *Engineering, Construction and Architectural Management*. 0969-9988
Published
Refereed?: Yes, Open Access?: No
34. Huang, H., Zhang, C., Hammad, A. (2021). Effective Scanning Range Estimation for Using TLS at Construction Projects. *ASCE Journal of Construction Engineering and Management*. 147(9)
Published
Refereed?: Yes, Open Access?: No
35. Salimi, S.* and Hammad, A. (2020). Sensitivity analysis of probabilistic occupancy prediction model using big data. *Building and Environment*. 172(106729)
Published
Refereed?: Yes, Open Access?: No
36. Salimi, S.* and Hammad, A. (2020). Optimizing energy consumption and occupants comfort in open-plan offices using local control based on occupancy dynamic data. *Building and Environment*. 176(106818)
Published
Refereed?: Yes, Open Access?: No
37. Igwe, C.*, Hammad, A., Nasiri, F. (2020). Influence of lean construction wastes on the transformation-flow-value process of construction. *International Journal of Construction Management*. (1812153)
Published
Refereed?: Yes
38. Alaghbandrad, A.*, and Hammad, A. (2020). Framework for multi-purpose utility tunnel lifecycle cost assessment and cost-sharing. *Tunnelling and Underground Space Technology*. 104(103528)
Published
Refereed?: Yes, Open Access?: No
39. Salimzadeh, N.*, Vahdatikhaki, F., Hammad, A. (2020). Parametric modeling and surface-specific sensitivity analysis of PV module layout on building skin using BIM. *Energy and Buildings*. 216(109953)
Published
Refereed?: Yes, Open Access?: No
40. Chen, C.*, Zhu, Z., and Hammad, A. (2020). Automated excavators activity recognition and productivity analysis from construction site surveillance videos. *Automation in Construction*. 110(103045)
Published
Refereed?: Yes, Open Access?: No
41. Bolourian, N.*, Hammad, A. (2020). LiDAR-equipped UAV path planning considering potential locations of defects for bridge inspection. *Journal of Automation in Construction*. 117(103250)
Published
Refereed?: Yes
42. Guevremont, M.* and Hammad, A. (2020). Review and Survey of 4D Simulation Applications in Forensic Investigation of Delay Claims in Construction Projects. *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*. 12(3)
Published
Refereed?: Yes
43. Luo, Y.*, Alaghbandrad, A.*, Genger, T. K.*, & Hammad, A. (2020). *History and recent development of multi-purpose utility tunnels*. *Tunnelling and Underground Space Technology*. 103(103511)
Published
Refereed?: Yes, Open Access?: No
44. Guevremont, M.* and Hammad, A. (2020). Levels of Development Definition for 4D Simulation of Construction Projects. *International Journal of Hydropower and Dams*. 27(4): 76-92.
Published
Refereed?: Yes, Open Access?: Yes

45. Salimi, S.* and Hammad, A. (2019). Critical Review and Research Roadmap of Office Building Energy Management Based on Occupancy Monitoring. Elsevier Journal of Energy and Buildings. 182: 214-241.
Published
Refereed?: Yes, Open Access?: No
46. Vahdatikhaki, F., El Ammari, K., Langroodi, A.K., Miller, S., Hammad, A., and Dorée, A. (2019). Beyond data visualization: A context-realistic construction equipment training simulators. Journal of Automation in Construction. 106(102853)
Published
Refereed?: Yes, Open Access?: No
47. Mawlana, M.*, Hammad, A. (2019). Integrating Variance Reduction Techniques and Parallel Computing in Construction Simulation Optimization. Journal of Computing in Civil Engineering. 33(4): 04019026.
Published
Refereed?: Yes
48. Salimi, S.*, Liu, Z.*, and Hammad, A. (2019). Occupancy Prediction Model for Open-plan Offices Using Real-time Location System and Inhomogeneous Markov Chain. Building and Environment. 152: 1-16.
Published
Refereed?: Yes, Open Access?: No
49. Mawlana, M.*, Hammad, A. (2019). Integrating Variance Reduction Techniques and Parallel Computing in Construction Simulation Optimization. ASCE Journal of Computing in Civil Engineering. 33(4)
Published
Refereed?: Yes, Open Access?: No
50. El-Ammari, K.* and Hammad, A. (2019). Remote Interactive Collaboration for Facilities Management Using BIM-Based Mixed Reality. Journal of Automation in Construction. 107(102940)
Published
Refereed?: Yes
51. Sharif, S.A.* and Hammad, A. (2019). Developing Surrogate ANN for Selecting Near-Optimal Building Energy Renovation Methods Considering Energy Consumption, LCC and LCA. Elsevier Journal of Building Engineering. 25(100790)
Published
Refereed?: Yes, Open Access?: No
52. Siddiqui, H.*, Vahdatikhaki, F.*, Hammad, A. (2019). Case Study on Application of Wireless Ultra Wideband Technology for Tracking Equipment on Congested Sites. Information Technology in Construction. (May): 167-187.
Published
Refereed?: Yes, Open Access?: Yes
53. Abu-Samra, S.A., Ahmed, M.*, Hammad, A., and Zayed, T. (2018). Multi-Objective Framework for Managing Municipal Integrated Infrastructure. ASCE Journal of Construction Engineering and Management. 144(1): 13 pages.
Published
Refereed?: Yes, Open Access?: No
54. Soltani, M.*, Zhu, Z., and Hammad, A. (2018). Framework for Location Data Fusion and Pose Estimation of Excavators using Stereo Vision. ASCE Journal of Computing in Civil Engineering. 32(6): 17 pages.
Published
Refereed?: Yes, Open Access?: No
55. Guevremont, M.* and Hammad, A. (2018). Visualization of Delay Claim Analysis Using 4D Simulation. Journal of Legal Affairs and Dispute Resolution in Engineering and Construction. 10(3): 8 pages.
Published
Refereed?: Yes, Open Access?: No

56. Salimi, S.* , Mawlana, M.* , and Hammad, A. (2018). Performance Analysis of Simulation-based Optimization of Bridge Construction Projects Using High Performance Computing. Elsevier Journal of Automation in Construction. 87: 158–172.
Published
Refereed?: Yes, Open Access?: No
57. Zhang, B., Zhu, Z., Hammad, A., and Aly, W. (2018). Automatic Matching of Construction Objects under Different Camera Views. Elsevier Journal of Automation in Construction. 91: 206-215.
Published
Refereed?: Yes, Open Access?: No
58. Albahri, A.* and Hammad, A. (2018). Simulation-Based Optimization of PTZ Camera Placement and Movement Plan in Buildings Using BIM. Journal of Automation in Construction.
Accepted
Refereed?: Yes, Open Access?: No
59. Sharif, A.H.* and Hammad, A. (2018). Simulation-Based Multi-Objective Optimization of Institutional Building Renovation Considering Energy Consumption, Life-Cycle Cost and Life-Cycle Assessment. Elsevier Journal of Building Engineering. 21: 429-445.
Published
Refereed?: Yes, Open Access?: No
60. Vahdatikhaki, F.* , Langari, S.M.* , Taher, A.* , El-Ammari, K.* , and Hammad, A. (2017). Enhancing Coordination and Safety of Earthwork Equipment Operations Using Multi-Agent System. Journal of Automation in Construction. 81: 267–285.
Published
Refereed?: Yes, Open Access?: No
61. Soltani, M.* , Zhu, Z., and Hammad, A. (2017). Skeleton Estimation of Excavator by Detecting its Parts. Journal of Automation in Construction. 82: 1-15.
Published
Refereed?: Yes, Open Access?: No
62. Albahri, A.* and Hammad, A. (2017). A Novel Method for Calculating Camera Coverage in Buildings Using BIM. Journal of Information Technology in Construction. 22: 16-33.
Published
Refereed?: Yes, Open Access?: Yes
63. Albahri, A.* and Hammad, A. (2017). Simulation-Based Optimization of Surveillance Cameras Types, Number and Placement in Buildings Using BIM. ASCE Journal of Computing in Civil Engineering. 31(6): 15 pages.
Published
Refereed?: Yes, Open Access?: No

Book Chapters

1. Enshaei, N., Hammad, A. and Naderkhani, F. (2020). A Comprehensive Review on Advanced Maintenance Strategies for Smart Railways,. Handbook of Research on Interdisciplinary Approaches to Decision Making for Sustainable Supply Chains. : 433-457.
Published, IGI Global
Refereed?: Yes
2. Bolourian, N.* and Hammad, A. (2019). Path planning of LiDAR-equipped UAV for bridge inspection considering potential locations of defects. Advances in Informatics and Computing in Civil and Construction Engineering. : 77-83.
Published, Springer, Cham
Refereed?: Yes

3. Guevremont, M.* and Hammad, A. (2019). Defining Levels of Development for 4D Simulation of Major Capital Construction Projects. *Advances in Informatics and Computing in Civil and Construction Engineering*. : 77-83.
Published, Springer, Cham
Refereed?: Yes
4. Luo, Y.*, Alaghandrad, A.*, Genger, T. K.*, & Hammad, A. (2019). Smart multi-purpose utility tunnels. Anjali Awasthi. *Sustainable City Logistics Planning: Methods and Applications*. (Volume 3): 30 pages.
Published, Nova Science Publishers
Refereed?: Yes

Conference Publications

1. Huang, Y.* and Hammad, A. (2023). Simulation-based optimization of path planning of Camera-equipped UAV considering activities on construction site. *Creative Construction Conference, Hungary*
Paper
Published
Refereed?: Yes, Invited?: No
2. Genger, T.K.* and Hammad, A. (2023). Combining Predictions of Municipal Asset Conditions ?>at the Segment Level to Determine Street Closures. *The 30th EG-ICE: International Conference on Intelligent Computing in Engineering, London, United Kingdom*
Paper
Published
Refereed?: Yes, Invited?: No
3. Dunson-Todd, M., Nik-Bakht, M., and Hammad, A. (2023). Evaluating Occupational Exoskeleton Efficacy in Construction: Towards Guidelines for the Construction Industry. *CSCE Construction Speciality Conference, Canada*
Paper
Published
Refereed?: Yes, Invited?: No
4. Huang, Y.*, Ghelmani, A.*, and Hammad, A. (2023). Future Research Directions of Construction Digital Twins. *The 2023 European Conference on Computing in Construction (2023 EC³), Greece*
Paper
Published
Refereed?: Yes, Invited?: No
5. Ghelmani A.*, Hammad A. (2023). Single-Stage Excavator Activity Recognition Using Temporal Gradient and Knowledge Distillation,. *The 2023 European Conference on Computing in Construction (2023 EC³), Greece*
Paper
Published
Refereed?: Yes, Invited?: No
6. Jamali, A., Laflamme, C., Huber, R. and Hammad, A. (2023). Pavement Defect Classification and Localization Using Weakly-supervised Deep Learning. *Creative Construction Conference, Hungary*
Paper
Published
Refereed?: Yes, Invited?: No

7. Ghelmani A.* , Hammad A. (2022). Self-supervised Learning Approach for Excavator Activity Recognition Using Contrastive Video Representation. 29th International Workshop on Intelligent Computing in Engineering (EG-ICE), Denmark
Paper
Published
Refereed?: Yes, Invited?: No
8. Bolourian N.* , Hammad A., Ghelmani A.*. (2022). Point Cloud-Based Concrete Surface Defect Semantic Segmentation Using Modified PointNet++. 29th International Workshop on Intelligent Computing in Engineering (EG-ICE), Denmark
Paper
Published
Refereed?: Yes, Invited?: No
9. Genger, T. K.* , Hammad, A. (2022). Geospatial Visual Analytics for Supporting Decision Making for Underground Utility Integrated Interventions. International Conference on Transportation and Development, (46-59)
Paper
Published
Refereed?: Yes, Invited?: No
10. Huang, Y.* , Hammad, A., Torabi, G.* , Ghelmani, A.* and Guevremont, M.*. (2021). Towards Near Real-time Digital Twins of Construction Sites: Developing High LOD 4D Simulation Based on Computer Vision and RTLS. Proceedings of the 38th ISARC, Dubai, United Arab Emirates
Paper
Published
Refereed?: Yes, Invited?: No
11. Torabi, G.* , Hammad, A., Bouguila, N. (2021). Joint Detection and Activity Recognition of Construction Workers Using Convolutional Neural Networks. 2021 European Conference on Computing in Construction, Rhodes, Greece
Paper
Published
Refereed?: Yes, Invited?: No
12. Bahreini, F.* and Hammad, A. (2021). Point Cloud Semantic Segmentation of Concrete Surface Defects Using Dynamic Graph CNN. Proceedings of the 38th ISARC, Dubai, United Arab Emirates
Paper
Published
Refereed?: Yes, Invited?: No
13. Acosta, P.M.* , Vahdatikhaki, F., Santos, J., Hammad, A., Dore, A. (2021). (2021). A generalizability analysis of a data-driven method for the Urban Heat Island phenomenon assessment. Proceedings of the 38th ISARC, Dubai, United Arab Emirates
Paper
Published
Refereed?: Yes, Invited?: No
14. Jorjam, S.* and Hammad, A. (2021). Discrete Event Simulation of Multi-purpose Utility Tunnels Construction Using Microtunneling. Proceedings of the 38th ISARC, Dubai, United Arab Emirates
Paper
Published
Refereed?: Yes, Invited?: No

15. Dziedzic, R., Amador, L., An, C., Chen, Z., Eicker, U., Hammad, A., Nasiri, F., Nik-Bakht, M., Ouf, M. and Moselhi, O. (2021). A framework for asset management planning in sustainable and resilient cities. IEEE International Symposium on Technology and Society (ISTAS),
Paper
Published
Refereed?: Yes, Invited?: No
16. Acosta, P.M.*, Vahdatikhaki, F., Santos, J., Miguel, J., Hammad, A., Dore, A. (2021). How to bring UHI to the urban planning table? A data-driven modeling approach. Construction Management and Engineering. Proceedings of the 38th ISARC, Dubai, United Arab Emirates
Paper
Published
Refereed?: Yes, Invited?: No
17. Bahreini, F.* and Hammad, A. (2021). Towards an Ontology for BIM-Based Robotic Navigation and Inspection Tasks. Proceedings of the 38th ISARC, Dubai, United Arab Emirates
Paper
Published
Refereed?: Yes, Invited?: No
18. Nik-Bakht, M., An, C., Ouf, M., Hafeez, G., Dziedzic, R., Han, S., Nasiri, F., Eicker, U., Hammad, A. and Moselhi, O. (2021). Value Stream Mapping of Project Lifecycle Data for Circular Construction. Proceedings of the 38th ISARC, Dubai, UAE., Dubai, United Arab Emirates
Paper
Published
Refereed?: Yes, Invited?: No
19. Luo, Y.*, Hammad, A., Zhang, C. (2020). *Recent Development of Multi-purpose Utility Tunnels in China*. CSCE 7th International Construction Conference jointly with the Construction Research Congress, Montreal, Canada
Paper
Published
Refereed?: Yes, Invited?: No
20. Genger, T. K.*, Hammad, A. (2020). *Enhancing Asset Management Support Through Visual Analytics*. The INFRA 2020 Conference, Montreal, Canada
Abstract
Published
Refereed?: Yes, Invited?: Yes
21. Akbarzadeh, M.*, Zhu, Z., Hammad, A. (2020). Nested Network for Detecting PPE on Large Construction Sites Based on Frame Segmentation. Creative Construction e-Conference,
Paper
Published
Refereed?: Yes, Invited?: No
22. Huang, Y.*, Hammad, A., Zhu, Z. (2020). Providing Proximity Alerts to Workers on Construction Sites Using Bluetooth Low Energy RTLS. Proceedings of the Creative Construction e-Conference,
Paper
Published
Refereed?: Yes, Invited?: Yes
23. Chen, C.*, Zhu, Z., and Hammad, A. (2020). Automatic Analysis of Idling in Excavator's Operations Based on Excavator-Truck Relationships. ISARC Proceedings, Japan
Paper
Published
Refereed?: Yes, Invited?: No

24. Luo, Y.*, Genger, T. K.*, Hammad, A. (2020). *Multi-Criteria Decision Making for Multi-purpose Utility Tunnel Location Selection*. Utility Engineering & Surveying Institute of ASCE Pipelines 2020 Conference, Paper
Published
Refereed?: Yes, Invited?: No
25. Salimi, S.*, Zheng, L.* and Hammad, A. (2019). A generalized inhomogeneous Markov chain occupancy model for open-plan offices using Real Time Locating System data. Building Simulation 2019, Rome, Paper
Published
Refereed?: Yes, Invited?: No
26. Eftekharirad, R.*, Hosny, A., Nik-Bakht, M. and Hammad, A. (2019). Planning Building Rehabilitation Projects for Safe Evacuation Provisions - An Agent-Based Modelling Approach. Building Simulation 2019, Rome, Paper
Published
Refereed?: Yes, Invited?: No
27. Salimi, S.*, M. Nik-Bakht, A. Hammad. (2019). Towards an Ontology for Holistic Building Occupant Information Modelling. 10th International Conference IAQVEC Bari, Italy, IOP Conference Series: Materials Science and Engineering, Paper
Published
Refereed?: Yes, Invited?: No
28. Taher, A.*, Vahdatikhaki, F., and Hammad, A. (2019). Integrating Earthwork Ontology and Safety Regulations to Enhance Operations Safety. Proceedings of the 36th ISARC, Banff, Canada Paper
Published
Refereed?: Yes, Invited?: No
29. Igwe, C.*, Hammad, A., Nasiri, F. (2019). Using Lean Construction Tools and 4D Modelling for Equipment Workspace Planning. CSCE Annual Conference, Laval, Canada Paper
Published
Refereed?: Yes, Invited?: No
30. Nasrollahi, M.*, Bolourian, N.*, and Hammad, A. (2019). Concrete Surface Defect Detection Using Deep Neural Network Based on LiDAR Scanning. 7th CSCE International Construction Specialty Conference (jointly with the Construction Research Congress), Montreal, Paper
Published
Refereed?: Yes, Invited?: No
31. Zarei, F., Nik-Bakht, M., Hammad, A. (2019). Visualisation of Local Municipal Satisfaction by Twitter Data Analysis. CSCE 7th International Construction Conference jointly with the Construction Research Congress, Montreal, Canada, Paper
Published
Refereed?: Yes, Invited?: No
32. Luo, Y.*, Hammad, A. (2019). Multi-criteria Spatial Analysis of Multi-purpose Utility Tunnels. The INFRA 2019 Conference, Montreal, Canada
Abstract
Published
Refereed?: Yes, Invited?: Yes

33. Guevremont, M.* and Hammad, A. (2019). 4D Simulation Considering Adjusted Schedules for Safety Planning in Hydroelectric Projects. 26th European Group for Intelligent Computing in Engineering (EG-ICE) International Workshop,
Paper
Published
Refereed?: Yes, Invited?: No
34. Chen, C.*, Zhu, Z. Hammad, A. and Ahmed, W. (2019). Vision-based Excavator Activity Recognition and Productivity Analysis in Construction. ASCE International Conference on Computing in Civil Engineering, Atlanta,
Paper
Published
Refereed?: Yes, Invited?: No
35. Guevremont, M.* and Hammad, A. (2019). 4D Simulation for Rock Excavation Projects. CSCE 7th International Construction Conference jointly with the Construction Research Congress, Laval, Canada
Paper
Published
Refereed?: Yes, Invited?: No
36. Guevremont, M.* and Hammad, A. (2018). Defining Levels of Development for 4D Simulation of Major Capital Construction Projects. 35th CIB W78 Conference, Chicago, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
37. Bolourian, A.* and Hammad, A. (2018). Path Planning Of LiDAR-Equipped UAV for Bridge Inspection Considering Potential Locations of Defects. 35th CIB W78 Conference, Chicago, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
38. Zhang, B., Zhu, Z., Hammad, A. and Aly, W. (2018). Multi-View Matching for Onsite Construction Resources with Combinatorial Optimization. International Symposium on Automation and Robotics in Construction, Berlin, Germany
Paper
Published
Refereed?: Yes, Invited?: No
39. Guevremont, M.* and Hammad, A. (2018). Multi-LOD 4D Simulation in Phased Rehabilitation Projects. 17th International Conference on Computing in Civil and Building Engineering (ICCCBE), Tampere, Finland (724-731)
Paper
Published
Refereed?: Yes, Invited?: No
40. Igwe, C.*, Nasiri, F., Hammad, A., and Mohammadi, A. (2018). House of Wastes and its Implication for Project Management. Project Management Symposium, Baltimore, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
41. Salimzadeh, N.*, Vahdatikhaki, F. and Hammad, A. (2018). BIM-based Surface-specific Solar Simulation of Buildings. International Symposium on Automation and Robotics in Construction, Berlin, Germany
Paper
Published
Refereed?: Yes, Invited?: No

42. Alaghbandrad, A.* and Hammad, A. (2018). Developing Information Model for Multi-purpose Utility Tunnel Lifecycle Management. Construction Research Congress, New Orleans, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
43. Hammad, A., Motamedi, A., Yabuki, N., Taher, A.* and Bahreini, F.*. (2018). Towards Unified Ontology for Modeling Lifecycle Inspection and Repair Information of Civil Infrastructure Systems. Proceedings of the 17th International Conference on Computing in Civil and Building Engineering, Tampere, Finland
Paper
Published
Refereed?: Yes, Invited?: No
44. Eftekharirad, R.*, Nik-Bakht, M. and Hammad, A. (2018). Extending IFC for Fire Emergency Real-Time Management Using Sensors and Occupant Information. International Symposium on Automation and Robotics in Construction, Berlin, Germany
Paper
Published
Refereed?: Yes, Invited?: No
45. Eftekharirad, R.*, Nik-Bakht, M. and Hammad, A. (2018). Linking Sensory Data to BIM by Extending IFC – Case Study of Fire Evacuation. 12th European Conference on Product and Process Modelling, Copenhagen, Denmark
Paper
Published
Refereed?: Yes, Invited?: No
46. Nasrollahi, M.*, Bolourian, N.*, Zhu, Z. and Hammad, A. (2018). Designing LiDAR-equipped UAV Platform for Structural Inspection. International Symposium on Automation and Robotics in Construction, Berlin, Germany
Paper
Published
Refereed?: Yes, Invited?: No
47. Amrollahibuki, R.* and Hammad, A. (2018). Modeling Construction Equipment in 4D Simulation. 12th European Conference on Product and Process Modelling, Copenhagen, Denmark
Paper
Published
Refereed?: Yes, Invited?: No
48. Alaghbandrad, A.* and Hammad, A. (2018). PPP Cost-Sharing of Multi-purpose Utility Tunnels. Workshop of the European Group for Intelligent Computing in Engineering, lausanne, Switzerland (554-567)
Paper
Published
Refereed?: Yes, Invited?: No
49. Sharif, S.A.* and Hammad, A. (2017). Simulation-Based Optimization of Building Renovation Considering Energy Consumption and Life-Cycle Assessment. ASCE International Workshop on Computing in Civil Engineering, Seattle, United States of America
Paper
Published
Refereed?: Yes, Invited?: No

50. Igwe, I.*, Nasiri, F. and Hammad, A. (2017). Evaluating the Impact of Buildability Assessment and Value Management on Construction Project Delivery. Project Management Symposium, College Park, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
51. Guevremont, M.* and Hammad, A. (2017). Criticality Visualization Using 4D Simulation for Major Capital Projects. 50th Winter Simulation Conference (IEEE), Las Vegas, United States of America (2360-2371)
Paper
Published
Refereed?: Yes, Invited?: No
52. Taher, A.*, Vahdatikhaki, F., and Hammad, A. (2017). Towards Developing an Ontology for Earthwork Operations. Int. Workshop on Computing in Civil Engineering, Seattle, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
53. Soltani, M.M.*, Karandish, S.F.*, Ahmed, W., Zhu, Z., and Hammad, A. (2017). Evaluating the Performance of Convolutional Neural Network for Classifying Equipment on Construction Sites. International Symposium on Automation and Robotics in Construction, Taipei, Taiwan
Paper
Published
Refereed?: Yes, Invited?: No
54. Salimi, S.*, Zheng, L.* and Hammad, A. (2017). Simulation-based Optimization of Energy Consumption and Discomfort in Multi-Occupied Offices Considering Occupants Locations and Preferences. Building Simulation Conference, San Francisco, United States of America
Paper
Published
Refereed?: Yes, Invited?: No
55. Salimzadeh, N.* and Hammad, A. (2017). High-level framework for GIS-based optimization of building photovoltaic potential at urban scale using BIM and LiDAR. International Conference on Sustainable Infrastructure,
Paper
Published
Refereed?: Yes, Invited?: No
56. Bolourian, A.*, Soltani, M.M.*, Hammad, A., and Albahri, A.*. (2017). High Level Framework for Bridge Inspection Using LiDAR-equipped UAV. International Symposium on Automation and Robotics in Construction, Taipei, Taiwan
Paper
Published
Refereed?: Yes, Invited?: No

Date Submitted: 2024-02-01 15:32:19

Confirmation Number: 1737118

Template: Full CV

Dr. Walter Lucia

Correspondence language: English

Sex: Male

Date of Birth: 12/31

Canadian Residency Status: Permanent Resident

Permanent Residency Start Date: 2021/01/25

Contact Information

The primary information is denoted by (*)

Address

Primary Affiliation (*)

1515 St.Catherine Street West, EV.009.185

CIISE, Concordia University

Montreal Quebec H3G 2W1

Canada

Telephone

Work (*) 514-8482424 extension: 3982

Email

Work (*) walter.lucia@concordia.ca

Website

Personal <https://users.encs.concordia.ca/~wlucia/index.html>

Dr. Walter Lucia

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	No	No	Yes	No
Italian	Yes	Yes	Yes	Yes	Yes

Degrees

2012/11 - 2015/2	Doctorate, Doctor of Philosophy in System and Computer Engineering, Control Systems, Universita Di Calabria Degree Status: Completed Supervisors: Giuseppe Franzè, 2012/11 - 2015/2
2009/1 - 2011/3	Master's Thesis, Automation Engineering, Automation Engineering, Universita Di Calabria Degree Status: Completed
2005/9 - 2008/12	Bachelor's, Computer Engineering, Computer Engineering, Universita Di Calabria Degree Status: Completed

Credentials

2020/8	Associate Editor - IEEE Systems Journal, IEEE
2020/7	Professional Engineer Ontario (PEO), Professional Engineer Ontario
2020/7	Associate Editor - Journal of Control, Automation and Electrical Systems, Springer
2018/11	Chair of the IEEE Montreal Chapter: Control Systems, IEEE
2018/8	Associate Editor (Conference Editorial Board) - IEEE Control System Society, IEEE
2017/7	Chair of the IEEE Montreal Chapter: Systems, Man & Cybernetics, IEEE
2016/11	Assistant Professor, Concordia University

Recognitions

2021/11	Distinguished Reviewer Award IEEE International Conference on Autonomous Systems (ICAS) Distinction Best Reviewer Award
2021/5	Gina Cody School Award for Excellence in Teaching by a Junior Faculty Member Concordia University Distinction Teaching Award

- 2019/4 Best Paper Award in the 6th International Conference on Control Decision and Information Technologies (CoDIT 2019)
IEEE Systems, Man, and Cybernetics Society
Prize / Award
Best Paper Award
- 2015/1 - 2016/10 Postdoctoral Fellowship, POR Calabria (CCI No 2007 IT 161 PO 008)
Universita Di Calabria
Prize / Award
Scholarship for research on automotive powertrain

User Profile

Researcher Status: Researcher

Research Interests: **Networked Control Systems and Secure and Resilient Control of Cyber-Physical Systems:** Development of set-theoretic control strategies for networked systems subject to time-varying delays, packet dropouts and cyber-attacks. **Model predictive control strategies for autonomous vehicles:** Development of optimal, real-time affordable and predictive control strategies for autonomous vehicles moving in adverse environments. **Fault tolerant control:** Development of model predictive control schemes for plant subject to stuck actuators and sensors. **Control of switching/switched systems:** Development of control strategies capable of dealing with plants characterized by a finite collection of switching/switched dynamical models.

Research Specialization Keywords: Model Predictive Control, Set-Theoretic Control, Cyber-Physical Systems, Networked Control Systems, Fault-Tolerant Control, Control of Unmanned Vehicles

Disciplines Trained In: Computer Engineering and Software Engineering, Electrical Engineering and Electronic Engineering

Research Disciplines: Computer Engineering and Software Engineering, Electrical Engineering and Electronic Engineering

Areas of Research: Control System

Fields of Application: Energy, Security, Transport

Employment

- 2021/6 Associate Professor
Concordia Institute for Information Systems Engineering (CIISE), Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2016/11 - 2021/5 Assistant Professor
Concordia Institute for Information Systems Engineering (CIISE), Faculty of Engineering, Concordia University
Full-time, Assistant Professor
Tenure Status: Tenure Track
- 2015/1 - 2016/11 Postdoctoral Researcher
DIMES, Faculty of Engineering, Universita Di Calabria
Full-time
Tenure Status: Non Tenure Track
- 2015/9 - 2016/2 Postdoctoral Researcher
ECE, Faculty of Engineering, Carnegie-Mellon University
Full-time
Tenure Status: Non Tenure Track
Develop of control techniques for secure control of Cyber-Physical systems

2013/3 - 2013/12 Visiting Research Scholar
 ECE, Faculty of Engineering, Northeastern University
 Full-time
 Tenure Status: Non Tenure Track
 Research on control strategies for quadcopters

Affiliations

The primary affiliation is denoted by (*)

(*) 2021/6 Associate Professor, CIISE, Concordia University

2016/11 - 2021/5 Assistant Professor, CIISE, Concordia University

Research Funding History

Awarded [n=6]

2018/5 - 2025/3 Secure and Resilient Control of Constrained Cyber-Physical Systems Subject to Network
 Principal Applicant Attacks, Grant

Funding Sources:

2018/4 - 2025/3 Natural Sciences and Engineering Research Council of Canada
 (NSERC)
 Total Funding - 196,000 (Canadian dollar)
 Portion of Funding Received - 196,000
 Funding Competitive?: Yes

2021/5 - 2024/4 Atténuation résiliente, détection et contrôle de la récupération des infrastructures critiques
 Co-applicant sujettes à des cyberattaques et intrusions malveillantes, Grant

Funding Sources:

2021/4 - 2024/3 Fonds de recherche du Québec - Nature et technologies (FRQNT)
 Total Funding - 150,000 (Canadian dollar)
 Portion of Funding Received - 31,600
 Funding Competitive?: Yes

2023/7 - 2023/12 Control of multi-agent robots: an opinion dynamics approach, Grant
 Principal Investigator Project Description: Distributed Positioning and Formation Management Techniques in a
 Swarm of Robots

Funding Sources:

2023/7 - 2023/11 Mathematics of Information Technology and Complex Systems
 (MITACS)
 MITACS Globalink Research Award for research Abroad
 Total Funding - 6,000 (Canadian dollar)
 Portion of Funding Received - 6,000 (Canadian dollar)
 Funding Competitive?: Yes

2023/7 - 2023/12 Distributed Positioning and Formation Management Techniques in a Swarm of Robots,
 Principal Applicant Grant
 Project Description: Control of multi-agent robots: an opinion dynamics approach

Funding Sources:

2023/7 - 2023/11 Mathematics of Information Technology and Complex Systems (MITACS)
 MITACS Globalink Research Award for research Abroad
 Total Funding - 6,000 (Canadian dollar)
 Portion of Funding Received - 6,000 (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

2022/9 - 2023/9
 Co-applicant

Cybersecurity Monitoring, Diagnosis, Mitigation & Resilient Operation of Naval IT/OT/PT Systems Against Malicious Attacks, Grant
 Project Description: Cybersecurity Monitoring, Diagnosis, Mitigation \& Resilient Operation of Naval IT/OT/PT Systems Against Malicious Attacks

Funding Sources:

2022/9 - 2023/9 Innovation for Defence Excellence and Security (IDEaS)
 Total Funding - 1,000,000 (Canadian dollar)
 Portion of Funding Received - 166,000 (Canadian dollar)
 Funding Competitive?: Yes

2019/5 - 2023/4
 Principal Applicant

Secure and Resilient Control of Constrained Cyber-Physical Systems Subject to Network Attacks, Grant

Funding Sources:

2018/4 - 2023/4 Natural Sciences and Engineering Research Council of Canada (NSERC)
 DGEER – Discovery Launch Supplement
 Total Funding - 12,500 (Canadian dollar)
 Portion of Funding Received - 12,500
 Funding Competitive?: Yes

Completed [n=10]

2023/2 - 2023/8
 Principal Applicant

Set-Theoretic Output Feedback Control for Safety-Critical LPVsystems, Grant
 Project Description: Set-Theoretic Output Feedback Control for Safety-Critical LPVsystems

Funding Sources:

2023/2 - 2023/8 Mathematics of Information Technology and Complex Systems (MITACS)
 MITACS Globalink Research Award for research in Canada
 Total Funding - 6,000 (Canadian dollar)
 Portion of Funding Received - 6,000 (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

2020/11 - 2022/12
 Co-applicant

Toward Intelligent and Resilient Smart Cities with Energy-Vehicle-Human Interactions, Grant, Equipment

Funding Sources:

2020/5 - 2024/12 Canada Foundation for Innovation (CFI)
 Total Funding - 1,808,000 (Canadian dollar)
 Portion of Funding Received - 214,000 (Canadian dollar)
 Funding Competitive?: Yes

2022/1 - 2022/6
 Principal Applicant

Experimental validation of Cyber-Physical systems security techniques, Grant

Project Description: Setpoint attacks detection in cyber-physical systems: experimental validation using unmanned vehicles

Funding Sources:

2019/9 - 2020/2 Mathematics of Information Technology and Complex Systems (MITACS)
MITACS Globalink Research Award for research Abroad
Total Funding - 6,000 (Canadian dollar)
Portion of Funding Received - 6,000
Funding Competitive?: Yes

2019/5 - 2021/4
Principal Applicant

Computationally low demanding model predictive control strategies for the secure control of autonomous vehicles in smart cities, Grant, Establishment

Funding Sources:

2019/4 - 2021/4 Fonds de recherche du Québec - Nature et technologies (FRQNT)
Etablissement de la relève professorale
Total Funding - 89,100 (Canadian dollar)
Portion of Funding Received - 89,100
Funding Competitive?: Yes

2020/1 - 2020/10
Co-applicant

Multivariable PID Controller for Search and Rescue UAV Operations Based on Static Output Feedback, Grant

Funding Sources:

2020/1 - 2020/6 Mathematics of Information Technology and Complex Systems (MITACS)
MITACS Accelerate
Total Funding - 15,000 (Canadian dollar)
Portion of Funding Received - 7,500
Funding Competitive?: Yes

Co-applicant : Luis Rodrigues

2019/9 - 2020/2
Principal Applicant

Formation control of unmanned aerial vehicles in presence of obstacles, Grant
Project Description: Experimental validation of Cyber-Physical systems security techniques

Funding Sources:

2019/1 - 2019/6 Mathematics of Information Technology and Complex Systems (MITACS)
MITACS Globalink Research Award for research in Canada
Total Funding - 6,000 (Canadian dollar)
Portion of Funding Received - 6,000
Funding Competitive?: Yes

2019/5 - 2019/11
Principal Applicant

Setpoint attacks detection in cyber-physical systems: experimental validation using unmanned vehicles, Grant
Project Description: Formation control of unmanned aerial vehicles in presence of obstacles

Funding Sources:

2019/7 - 2020/7 Mathematics of Information Technology and Complex Systems (MITACS)
 MITACS Globalink Research Award for research Abroad
 Total Funding - 6,000 (Canadian dollar)
 Portion of Funding Received - 6,000
 Funding Competitive?: Yes

2016/11 - 2019/4
 Principal Applicant

Concordia University Start-Up Grant, Grant, Establishment

Funding Sources:

2016/11 - 2019/4 Concordia University
 Total Funding - 50,000 (Canadian dollar)
 Portion of Funding Received - 50,000
 Funding Competitive?: No

2018/3 - 2019/3
 Co-applicant

Intelligent Control, Diagnosis, and Security of Smart Grid Networks, Grant, Equipment

Funding Sources:

2018/1 - 2018/12 Concordia University
 Total Funding - 100,000 (Canadian dollar)
 Portion of Funding Received - 14,000 (Canadian dollar)
 Funding Competitive?: Yes

2018/3 - 2019/3
 Co-applicant

STARBASE-I: Integrated Smart Microgrids and Autonomous Vehicles Research TestBed for Smart Connected Communities, Grant, Equipment

Funding Sources:

2018/1 - 2018/12 Concordia University
 Total Funding - 100,000 (Canadian dollar)
 Portion of Funding Received - 14,000 (Canadian dollar)
 Funding Competitive?: Yes

Courses Taught

Instructor, Concordia University

Course Title: Principle of Electric Engineering

Course Topic: Principle of Electric Engineering

Course Level: Undergraduate

Instructor, Concordia University

Course Title: Robotic Manipulator II: Control

Course Topic: Robotic Manipulator

Course Level: Graduate

Instructor, Concordia University

Course Title: Smart Grids and Control Systems Security

Course Topic: Smart Grid Security

Course Level: Graduate

Instructor, Concordia University

Course Title: Recent Developments in Information Systems Security

Course Topic: Cyber-Physical Systems Security

Course Level: Graduate

Instructor, Concordia University
 Course Title: Fundamentals and Applications of Cyber-Physical Systems
 Course Topic: Cyber-Physical Systems
 Course Level: Graduate

Instructor, Concordia University
 Course Title: Fundamentals of Control Systems
 Course Code: ELEC 372
 Course Topic: Control Systems
 Course Level: Undergraduate

Student/Postdoctoral Supervision

Master's Thesis [n=11]

2022/9 - 2024/9 Principal Supervisor	Suryaprakash Rajkumar (In Progress) , Concordia University Student Degree Start Date: 2022/9 Thesis/Project Title: Control of Intelligent Transportation Systems Present Position: Master Student
2020/9 - 2022/12 Principal Supervisor	Amir Mohammad Naseri (Completed) , Concordia University Student Degree Start Date: 2020/9 Student Degree Received Date: 2022/12 Thesis/Project Title: Encrypted Control Systems Present Position: Master Student
2020/1 - 2022/9 Co-Supervisor	Mattia Cersullo (Completed) , University of Calabria Student Degree Start Date: 2020/1 Student Degree Received Date: 2022/12 Thesis/Project Title: Set-point attach detection in cyber-physical systems Present Position: Automation and Control Engineer
2019/1 - 2020/12 Co-Supervisor	Ahmed Mohamed AbdELwahhab (Completed) , Concordia University Student Degree Start Date: 2019/1 Student Degree Received Date: 2020/12 Thesis/Project Title: Secure Control of Smart Grids subject to cyber attacks Present Position: Cyber Security Analyst, Bell Canada
2019/1 - 2020/12 Principal Supervisor	Shima Savehshemshaki (Completed) , Concordia University Student Degree Start Date: 2019/1 Student Degree Received Date: 2019/1 Thesis/Project Title: Control of Autonomous Vehicles Present Position: Software Designer, Matrox
2019/1 - 2021/6 Co-Supervisor	Alan Cristoffer (Completed) , University Unidade Divinópolis (Brasil) Student Degree Start Date: 2017/1 Student Degree Received Date: 2020/12 Thesis/Project Title: Command Governor Strategies for Switching Systems Present Position: PhD Student, Université de Reims Champagne-Ardenne
2018/1 - 2020/6 Co-Supervisor	Cristian Tiriolo (Completed) , University of Calabria Student Degree Start Date: 2018/1 Student Degree Received Date: 2020/12 Thesis/Project Title: Control of Unmanned Vehicles Present Position: PhD Student, Concordia University

- 2017/9 - 2019/11
Principal Supervisor Ghaderi, Mohsen (Completed) , Concordia University
Student Degree Start Date: 2017/9
Student Degree Received Date: 2019/12
Thesis/Project Title: Fault Tolerant Control Systems For Vehicle Formation
Present Position: Software Developer, Amdocs
- 2017/9 - 2020/8
Principal Supervisor Bagherzadeh, Maryam (Completed) , Concordia University
Student Degree Start Date: 2017/9
Student Degree Received Date: 2020/3
Thesis/Project Title: Predictive control strategies for autonomous vehicles
Present Position: Software Engineer, Segula Technologies
- 2017/1 - 2019/6
Co-Supervisor Antonello Venturino (Completed) , University of Calabria
Student Degree Start Date: 2017/1
Student Degree Received Date: 2019/12
Thesis/Project Title: A distributed model predictive control strategy for teams of autonomous vehicles operating in uncertain environments
Present Position: PhD Student, Université Paris-Saclay and ONERA
- 2016/1 - 2018/6
Co-Supervisor Flavia Grandinetti (Completed) , University of Calabria
Student Degree Start Date: 2016/1
Student Degree Received Date: 2018/12
Thesis/Project Title: Tracking controllers for drone swarms
Present Position: Flight Control System Engineering, Leonardo Helicopters

Doctorate [n=4]

- 2021/9 - 2025/9
Principal Supervisor Geovana Franca (In Progress) , Concordia University
Student Degree Start Date: 2021/9
Thesis/Project Title: Constrained Output Feedback Control
Present Position: PhD Student
- 2020/9 - 2024/9
Principal Supervisor Mehran Attar (In Progress) , Concordia University
Student Degree Start Date: 2020/9
Thesis/Project Title: Data-driven methods for Cyber-Physical Systems
Present Position: PhD Student
- 2020/9 - 2024/9
Principal Supervisor Cristian Tiriolo (In Progress) , Concordia University
Student Degree Start Date: 2020/9
Thesis/Project Title: Control of Unmanned Vehicles
Present Position: PhD Student
- 2017/9 - 2022/1
Principal Supervisor Gheitasi, Kian (Completed) , Concordia University
Student Degree Start Date: 2017/9
Student Degree Received Date: 2022/1
Thesis/Project Title: Secure and Resilient Control of Cyber-Physical Systems
Present Position: PhD student, Concordia University

Editorial Activities

- 2020/6 Associate Editor, Elsevier Journal of Control, Automation and Electrical Systems, Journal
- 2018/1 Associate Editor, IEEE Control System Society - Conference Editorial Board, Conference Abstract

Journal Review Activities

Reviewer,IEEE Transactions on Smar Grid
Number of Works Reviewed / Refereed: 2

Reviewer,Asian Journal of Control,Wiley
Number of Works Reviewed / Refereed: 2

Reviewer,European Journal of Control
Number of Works Reviewed / Refereed: 2

Reviewer,IEEE Transactions on Systems, Man, and Cybernetics: Systems
Number of Works Reviewed / Refereed: 1

Reviewer,Asian Journal of Control
Number of Works Reviewed / Refereed: 1

Reviewer,IEEE Transactions on Automatic Control,IEEE
Number of Works Reviewed / Refereed: 20

Reviewer,IET Control Theory & Applications,IET
Number of Works Reviewed / Refereed: 11

Reviewer,IEEE Transactions on Control Systems Technology,IEEE
Number of Works Reviewed / Refereed: 8

Reviewer,IET Signal Processing,IET
Number of Works Reviewed / Refereed: 2

Reviewer,International Journal of Adaptive Control and Signal Processing
Number of Works Reviewed / Refereed: 3

Reviewer,IEEE Transactions on Control of Network System,IEEE
Number of Works Reviewed / Refereed: 12

Reviewer,IEEE/CAA Journal of Automatica Sinica,IEEE/CAA
Number of Works Reviewed / Refereed: 5

Reviewer,Control Engineering Practice,Elsevier
Number of Works Reviewed / Refereed: 1

Reviewer,Journal of Control, Automation and Electrical Systems,Springer
Number of Works Reviewed / Refereed: 1

Reviewer,IEEE Access,IEEE

Reviewer,Journal of Franklin Institute,Elsevier
Number of Works Reviewed / Refereed: 14

Reviewer,IEEE Control Systems Letters
Number of Works Reviewed / Refereed: 12

Reviewer,Automatica,Elsevier
Number of Works Reviewed / Refereed: 17

Reviewer,Transactions on Signal and Information Processing over Network,IEEE
Number of Works Reviewed / Refereed: 1

Conference Review Activities

Reviewer, IEEE Conference on Decision and Control, Blind, IEEE
Number of Works Reviewed / Refereed: 10

Reviewer, International Conference on Control, Decision and Information Technologies, Blind

Number of Works Reviewed / Refereed: 2

Reviewer, European Control Conference, Blind

Number of Works Reviewed / Refereed: 4

Reviewer, International Conference on Cyber-Physical Systems, Blind

Number of Works Reviewed / Refereed: 1

Reviewer, IEEE Conference on Control Technology and Applications, Blind

Number of Works Reviewed / Refereed: 6

Reviewer, Mediterranean Conference on Control and Automation, Blind

Number of Works Reviewed / Refereed: 2

Reviewer, IFAC World Congress, Blind, IFAC

Number of Works Reviewed / Refereed: 5

Reviewer, American Control Conference, Blind

Number of Works Reviewed / Refereed: 4

Committee Memberships

2018/9 Chair, IEEE Control System (CS) Society, Montreal Chapter, IEEE

2017/7 Chair, IEEE Systems, Man & Cybernetics (SMC) Society, Montreal Chapter, IEEE

Publications

Journal Articles

1. M. Attar and W. Lucia. (2023). *An active detection strategy based on dimensionality reduction for false data injection attacks in cyber-physical systems*. IEEE Transactions on Control of Network Systems (CONES). In Press,
Refereed?: Yes, Open Access?: No
2. A. Rahiminejad, M. Ghafouri, R. Atallah, W. Lucia, M. Debbabi, and A. Mohammadi. (2023). Resilience enhancement of islanded microgrids by diversification, reconfiguration, and der placement/sizing. International Journal of Electrical Power and Energy Systems. 147
Published,
Refereed?: Yes
3. C. Tiriolo, W. Lucia. (2023). On the design of control invariant regions for feedback linearized car-like vehicles. IEEE Control Systems Letters. 7: 739-744.
Published,
Refereed?: Yes
4. W. Lucia, G. Franze', B. Sinopoli. (2023). A supervisor-based control architecture for constrained cyber-physical systems subject to network attacks. IEEE Transactions on Control of Network Systems. 10(3): 1184-1194.
Published,
Refereed?: Yes

5. K. Gheitasi, W. Lucia. (2023). A worst-case approach to safety and reference tracking for cyber-physical systems under network attacks. *IEEE Transactions on Automatic Control*. 68(7): 4391-4397.
In Press,
Refereed?: Yes
6. W. Lucia, J. G. Ernesto, and E. B. Castelan. (2023). *Set-theoretic output feedback control: a bilinear programming approach*. *Automatica*.
In Press,
Refereed?: Yes, Open Access?: No
7. C. Tiriolo and W. Lucia. (2023). *A set-theoretic control approach to the trajectory tracking problem for input-output linearized wheeled mobile robots*. *IEEE Control Systems Letters (L-CSS)*.
In Press,
Refereed?: Yes, Open Access?: No
8. M. Attar and W. Lucia. (2023). *Data-driven robust backward reachable sets for set-theoretic model predictive control*. *IEEE Control Systems Letters (L-CSS)*.
In Press,
Refereed?: Yes, Open Access?: No
9. G. A. Franca dos Santos, E. B. Castelan, and W. Lucia. (2023). *On the design of constrained pi-like output-feedback tracking controllers via robust positive invariance and bilinear programming*. *IEEE Control System Letters (L-CSS)*. 7: 1429–1434.
Published,
Refereed?: Yes
10. G. Franze', D. Famularo, W. Lucia, F. Tedesco. (2023). Cyber-physical systems subject to false data injections: a model predictive control framework for resilience operations. *Automatica*.
Accepted,
Refereed?: Yes
11. W. Lucia and A. Youssef. (2022). A key agreement scheme for cyber-physical systems. *IEEE Transactions on Systems, Man, and Cybernetics: Systems*. 52(8): 5368-5373.
Published,
Refereed?: Yes
12. G. Franze', W. Lucia, and F. Tedesco. (2022). Resilient model predictive control for constrained networked systems subject to severe attacks on the communication channels. *IEEE Transactions on Automatic Control*. 67(4): 1822-1836.
Published,
Refereed?: Yes
13. C. Tiriolo, G. Franze', and W. Lucia. (2022). A receding horizon trajectory tracking strategy for input-constrained differential-drive robots via feedback-linearization. *IEEE Transactions on Control Systems Technology*.
In Press,
Refereed?: Yes
14. A. M. Naseri, W. Lucia, A. Youssef. (2022). Confidentiality attacks against encrypted control systems. *Cyber-Physical Systems*. : 1-20.
Published,
Refereed?: Yes
15. M. Babahaji, S. Blouin, W. Lucia, M. M. Asadi, H. Mahboubi, A. G. Aghdam. (2022). Estimation of the connectivity of random graphs through q-learning techniques. *Journal of Radio Frequency Identification*. 6: 318-331.
Published,
Refereed?: Yes

16. A. M. Naseri, W. Lucia, A. Youssef. (2022). Encrypted cloud-based set-theoretic model predictive control. *IEEE Control System Letters*. 6: 3031-3037.
Published,
Refereed?: Yes
17. M. Bagherzadeh, S. Savehshemshaki, and W. Lucia. (2022). Guaranteed collision-free reference tracking in constrained multi unmanned vehicle systems. *IEEE Transactions on Automatic Control*. 67(6): 3087-3089.
Published,
Refereed?: Yes
18. K. Gheitasi, W. Lucia. (2022). Undetectable finite-time covert attack on constrained cyber-physical systems. *IEEE Transactions on Control of Network Systems*. 9(2): 1040-1048.
Published,
Refereed?: Yes
19. A.C. e Sousa, W. Lucia, Luis FP Silva, V. JS Leite. (2022). Command governor strategy based on region of attraction control switching. *Journal of Control, Automation and Electrical Systems*. 33(3): 767-779.
Published,
Refereed?: Yes
20. G. Franze', W. Lucia, A. Venturino. (2021). A distributed model predictive control strategy for constrained multi-vehicle systems moving in unknown environments. *IEEE Transaction on Intelligent Vehicles*. 6(2): 343-352.
Published,
Refereed?: Yes
21. K. Gheitasi, W. Lucia. (2021). A safety preserving control architecture for cyber-physical systems. *International Journal of Robust and Nonlinear Control*. 31(8): 3036-3053.
Published,
Refereed?: Yes
22. W. Lucia, G. Franze', D. Famularo. (2021). A receding horizon event-driven control strategy for intelligent traffic management. *Discrete Event Dynamic Systems: Theory and Applications Journal*. 31(3): 469-488.
Published,
Refereed?: Yes
23. M. Ghaderi, K. Gheitasi, and W. Lucia. (2021). A blended active detection strategy for false data injection attacks in cyber-physical systems. *IEEE Transactions on Control of Network Systems*. 8(1): 168-176.
Published, IEEE,
Refereed?: Yes
24. W. Lucia and A. Youssef. (2021). Covert channels in stochastic cyber-physical systems. *IET Cyber-Physical Systems: Theory & Applications*. 6(4): 228-237.
Published,
Refereed?: Yes
25. G. Franze', D. Famularo, W. Lucia, and F. Tedesco. (2020). A resilient control strategy for cyber-physical systems subject to denial of service attacks: a leader-follower set-theoretic approach. *IEEE/CAA Journal of Automatica Sinica*. 7(5): 1204-1214.
Published,
Refereed?: Yes
26. W. Lucia, K. Gheitasi, and M. Ghaderi. (2020). Setpoint attack detection in cyber-physical systems. *IEEE Transactions on Automatic Control (TAC)*. 66(5): 2332-2338.
Published,
Refereed?: Yes, Open Access?: No

27. W. Lucia and A. Youssef. (2020). Wyner wiretap-like encoding scheme for cyber-physical systems. *IET Cyber-Physical Systems: Theory & Applications*. 5(4): 359-365.
Published, IET,
Refereed?: Yes
28. M. Bagherzadeh. and W. Lucia. (2020). A set-theoretic model predictive control approach for transient stability in smart grid. *IET Control Theory & Applications*. 14(5): 700-707.
Published,
Refereed?: Yes, Open Access?: No
29. Lucia W, Franze' G, Sznaier M. (2020). A Hybrid Command Governor scheme for rotary wings unmanned aerial vehicles. *IEEE Transactions on Control System Technology*. 28(2): 361-375.
Published,
Refereed?: Yes
30. A. Abdelwahab, W. Lucia, and A. Youssef. (2020). Covert channels in cyber-physical systems. *IEEE Control Systems Letters*. 5: 1273-1278.
Published,
Refereed?: Yes
31. G. Franze', F. Tedesco, and W. Lucia. (2019). Resilient control for cyber-physical systems subject to replay attacks. *IEEE Control Systems Letters*. 3(4): 989-989.
Published,
Refereed?: Yes
32. Famularo D, Franze' G, Lucia W, Manna C. (2019). A reconfiguration control framework for constrained systems with sensor stuck faults. *International Journal of Robust and Nonlinear Control*. 29(4): 1150-1164.
Published,
Refereed?: Yes
33. Franzè G, Lucia W, Tedesco F. (2018). A Distributed Model Predictive Control Scheme for Leader-Follower Multi-Agent Systems. *International Journal of Control*. : 1-14.
Published,
Refereed?: Yes, Open Access?: No
34. Lucia W, Famularo D, Franzè G. (2018). A set-theoretic reconfiguration feedback control scheme against simultaneous stuck positions on the actuation channels. *IEEE Transactions on Automatic Control*. 63(8): 2558-2565.
Published,
Refereed?: Yes, Open Access?: No
35. Lucia W, Franzè G. (2017). Stabilization and reference tracking for constrained switching systems: a predictive control approach. *International Journal of Adaptive Control and Signal Processing*. 31(12): 1871-1884.
Published,
Refereed?: Yes
36. Franzè G, Lucia W, Tedesco F. (2017). Command Governor for constrained switched systems with scheduled model transition dwell times. *International Journal of Robust and Nonlinear Control*. 27(18): 4949-4967.
Published,
Refereed?: Yes, Open Access?: No
37. Bou-Harb E, Lucia W, Forti N, Weerakkody S, Sinopoli B. (2017). Cyber Meets Control: A Novel Federated Approach for Resilient CPS Leveraging Real Cyber Threat Intelligence. *IEEE Communications Magazine*. 55(5): 198-204.
Published,
Refereed?: Yes, Open Access?: No

38. Franzè G, Casavola A, Famularo D, Lucia W. (2017). Distributed Receding Horizon Control of Constrained Networked Leader-Follower Formations subject to Packet Dropouts. *IEEE Transactions on Control System Technology*. 26(5): 1798-1809.
Published,
Refereed?: Yes, Open Access?: No
39. Franzè G, Lucia W. (2016). A receding horizon control strategy for autonomous vehicles in dynamic environments. *IEEE Transactions on Control Systems Technology*. 24(2): 695-702.
Published,
Refereed?: Yes, Open Access?: No
40. D'Alfonso L, Lucia W, Muraca P, Pugliese P. (2015). Mobile robot localization via EKF and UKF: a comparison based on real data. *Robotics and Autonomous Systems*. 74: 122-127.
Published,
Refereed?: Yes, Open Access?: No
41. Walter L, Tedesco F. (2015). A networked-based receding horizon scheme for constrained LPV systems. *European Journal of Control*. 25: 69-75.
Published,
Refereed?: Yes, Open Access?: No
42. Franzè G, Lucia W. (2015). An obstacle avoidance model predictive control scheme for mobile robots subject to nonholonomic constraints: a sum-of-squares approach. *Journal of the Franklin Institute*. 352(6): 2358-2380.
Published,
Refereed?: Yes, Open Access?: No
43. Franzè G, Lucia W. (2015). The obstacle avoidance motion planning problem for autonomous vehicles: a low-demanding receding horizon control scheme. *Systems and Control Letters*. 77: 1-10.
Published,
Refereed?: Yes

Conference Publications

1. S. Rajkumar, C. Tiriolo*, W. Lucia. Collision-Free Platooning of Mobile Robots through a Set-Theoretic Predictive Control Approach. American Control Conference (ACC), Toronto, Canada,
Conference Date: 2024/7
Paper
Accepted
Refereed?: Yes, Invited?: No
2. G. A. Franca dos Santos, W. B. Castelan, E. and W. Lucia. (2024). A Constrained Tracking Controller for Ramp and Sinusoidal Reference Signals using Robust Positive Invariance. American Control Conference (ACC), Toronto, Canada,
Conference Date: 2024/7
Paper
Accepted
Refereed?: Yes, Invited?: No
3. A. M. Naseri, W. Lucia, and A. Youssef. (2023). *An observer-based key agreement scheme for remotely controlled mobile robots*. Proceedings of the IFAC World Congress. IFAC World Congress, ,
Paper
Accepted
Refereed?: Yes, Invited?: No

4. C. Tiriolo, G. Franze', W. Lucia. (2023). An obstacle-avoidance receding horizon control scheme for constrained differential-drive robot via dynamic feedback linearization. American Control Conference, San Diego, United States of America,
Paper
Accepted
Refereed?: Yes, Invited?: No
5. J. G. Ernesto, E. B. Castellan, W Lucia, G. A. Franca dos Santos. (2022). Alternative implementation to an incremental output-feedback design approach for constrained discrete-time parameter-varying systems. IFAC-PapersOnLine. IFAC Workshop on Time Delay Systems, IFAC Workshop on Linear Parameter Varying Systems, (Joint SSSC, TDS, LPVS), Montreal, Canada (25-30),
Paper
Published
Refereed?: Yes, Invited?: No
6. A. M. Naseri, W. Lucia, A. Youssef. (2022). A privacy preserving solution for cloud-enabled set-theoretic model predictive control. European Control Conference, (894–899),
Paper
Published
Refereed?: Yes, Invited?: No
7. S. Savehshemshaki, W. Lucia. (2022). A robust receding-horizon collision avoidance strategy for constrained unmanned ground vehicles moving in shared planar environments. IEEE Conference on Decision and Control (CDC), Cancun, Mexico,
Paper
In Press
Refereed?: Yes, Invited?: No
8. M. Cersullo, C. Tiriolo, G. Franze', W. Lucia. (2022). A detection strategy for setpoint attacks against differential-drive robots. IEEE International Conference on Automation Science and Engineering (CASE), Mexico City, Mexico (1035–1040),
Paper
Published
Refereed?: Yes, Invited?: No
9. M. Babahaji, S. Blouin, W. Lucia, M. M. Asadi, H. Mahboubi, A. G. Aghdam. (2021). Random graphs estimation using q-learning. IEEE International Conference on Wireless for Space and Extreme Environments (WiSEE), (109-114),
Paper
Published
Refereed?: Yes, Invited?: No
10. A. M. Naseri, W. Lucia, M. Mannan, A. Youssef. (2021). On securing cloud-hosted cyber-physical systems using trusted execution environments. International Conference on Autonomous Systems (ICAS), Montreal, Canada (1-5),
Paper
Published
Refereed?: Yes, Invited?: No
11. G. Franze', W. Lucia, F. Tedesco. (2021). Covert attack detection for constrained cyber-physical systems regulated by robust model predictive controllers. Proceedings of the American Control Conference. American Control Conference (ACC), (3267-3272),
Paper
Published
Refereed?: Yes, Invited?: No

12. K. Gheitasi and W. Lucia. (2020). A finite-time stealthy covert attack against cyber-physical systems. Proceedings of Conference on Control Decision and Information Technologies. Int. Conference on Control, Decision and Information Technologies (CoDIT), (347-352),
Paper
Published
Refereed?: Yes, Invited?: No
13. S. Savehshemshaki, and W. Lucia. (2020). A receding horizon battery shortage prevention control strategy for electric unmanned vehicles. Proceedings of the IEEE Conference on Control Technology and Applications. IEEE Conference on Control Technology and Applications (CCTA), (261-266),
Paper
Published
Refereed?: Yes, Invited?: No
14. A. Abdelwahab, W. Lucia, and A. Youssef. (2020). Decoy-based moving target defense against cyber-physical attacks on smart grid. IEEE Electric Power and Energy Conference, (1-5),
Paper
Published
Refereed?: Yes, Invited?: No
15. C. Tiriolo, G. Franze, and W. Lucia. (2020). A receding horizon control strategy for constrained differential-drive robots moving in static unknown environment. Proceedings of the IEEE Conference on Control Technology and Applications. IEEE Conference on Control Technology and Applications (CCTA), (261-266),
Paper
Published
Refereed?: Yes, Invited?: No
16. W. Alqaisi, Y. Kali, and W. Lucia. (2020). Finite-time flight control of uncertain quadrotor uav based on modified non-singular fast terminal super-twisting control. Proceedings of the IEEE Conference on Control Technology and Applications. IEEE Conference on Control Technology and Applications, (37-42),
Paper
Published
Refereed?: Yes, Invited?: No
17. Alan C e Sousa, Luis FP Silva, Walter Lucia, and Valter JS Leite. (2020). Command governor strategy based on region of attraction control switching. Anais da Sociedade Brasileira de Automatica, ,
Paper
Published
Refereed?: Yes, Invited?: No
18. A. Abdelwahab, W. Lucia, and A. Youssef. (2020). Set-theoretic control for active detection of replay attacks with applications to smart grid. Proceedings of IEEE Conference on Control Technology and Applications. IEEE Conference on Control Technology and Applications (CCTA), (1004-1009),
Paper
Published
Refereed?: Yes, Invited?: No
19. A. Abdelwahab, W. Lucia, and A. Youssef. (2020). A dos-resilient set-theoretic controller for smart grid applications. Proceedings of IEEE PES General Meeting. IEEE PES General Meeting, (1-5),
Paper
Published
Refereed?: Yes, Invited?: No

20. M. Ghaderi, K. Gheitasi, and W. Lucia. (2019). A novel control architecture for the detection of false data injection attacks in networked control systems. Proceedings of the American Control Conference. American Control Conference (ACC), (134-144),
Paper
Published
Refereed?: Yes, Invited?: No
21. M. Bagherzadeh, W. Lucia. (2019). Multi-vehicle reference tracking with guaranteed collision avoidance. Proceedings of the European Control Conference. European Control Conference (ECC), (3329-3334),
Paper
Published
Refereed?: Yes, Invited?: No
22. A. Venturino, W. Lucia. (2019). A flexible distributed control strategy for teams of vehicles moving within severe obstacle scenarios. Proceedings of the IEEE Int. Conf. on Emerging Technologies and Factory Automation. IEEE International Conference on Emerging Technologies and Factory Automation (EFTA), (941-946),
Paper
Published
Refereed?: Yes, Invited?: No
23. K. Gheitasi, M. Ghaderi, W. Lucia. (2019). Novel networked control scheme with safety guarantees for detection and mitigation of cyber-attacks. Proceedings of the European Control Conference. European Control Conference (ECC), (1449-1454),
Paper
Published
Refereed?: Yes, Invited?: No
24. G. Franze, W. Lucia, F. Tedesco. (2019). A leader-follower set-theoretic approach for cyber-physical systems against denial-of-service attacks. Proceedings of Conference on Control Decision and Information Technologies. Int. Conference on Control Decision and Information Technologies (CoDIT), (73-78),
Paper
Published
Refereed?: Yes, Invited?: No
25. G. Franze, W. Lucia, B. Rahami. (2018). Distributed receding horizon control for rotating wings unmanned aerial vehicles: a time-varying topology strategy. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), (3329-3334),
Paper
Published
Refereed?: Yes, Invited?: No
26. W. Lucia, K. Gheitasi, and M. Bagherzadeh. (2018). A low computationally demanding model predictive control strategy for fast and robust transient stability in smart grid. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), (6013-6018),
Paper
Published
Refereed?: Yes, Invited?: No
27. W. Lucia, K. Gheitasi, and M. Ghaderi. (2018). A command governor based approach for detection of setpoint attacks in constrained cyber-physical systems. Proceeding of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), (4539-4534),
Paper
Published
Refereed?: Yes, Invited?: No

28. Lucia W, Famularo D, Furfaro A, Franzè G. (2018). Verification and Control of Hybrid Systems Under Safety Requirements. IFAC-PapersOnLine. IFAC Symposium on Robust Control Design (ROCOND), Florianópolis, Brazil (65-66),
Conference Date: 2018/9
Paper
Published
Refereed?: Yes, Invited?: No
29. Lucia W, Franze' G. (2017). Multi-vehicle formation control in uncertain environments. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), Melbourne, Australia (6580-6585),
Conference Date: 2017/12
Paper
Published
Refereed?: Yes, Invited?: No
30. Franzè G, Lucia W. (2016). A set-theoretic control architecture for constrained switching systems. Proceedings of the American Control Conference. American Control Conference (ACC), Boston, United States of America (685-690),
Conference Date: 2016/7
Paper
Published
Refereed?: Yes, Invited?: No
31. Lucia W, Sinopoli B, Franzè G. (2016). A set-theoretic approach for secure and resilient control of Cyber-Physical Systems subject to false data injection attacks. Cyber-Physical Systems Workshop (SOSCYPS), Science of Security for. Cyber-Physical Systems Week, Vienna, Austria (1-5),
Conference Date: 2016/4
Paper
Published
Refereed?: Yes, Invited?: No
32. Famularo D, Franzè G, Lucia W. (2016). Multiple stuck positions actuator faults: a model predictive based reconfigurable control scheme. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), Osaka, Japan (5091-5096),
Conference Date: 2015/12
Paper
Published
Refereed?: Yes, Invited?: No
33. Casavola A, Lucia W, Tedesco F. (2016). A networked-based MPC architecture for constrained LPV systems. Proceedings of IFAC-PapersOnLine. IFAC Workshop on Linear Parameter Varying Systems, Grenoble, France (158-163),
Conference Date: 2015/10
Paper
Published
Refereed?: Yes, Invited?: No
34. Franzè G, Lucia W, Tedesco F. (2015). A dwell-time based Command Governor approach for constrained switched systems. Proceedings of the American Control Conference. American Control Conference (ACC), Chicago, United States of America (1077-1082),
Conference Date: 2015/7
Paper
Published
Refereed?: Yes, Invited?: No

35. Lucia W, Sznaier M, Franzè G. (2015). An obstacle avoidance and motion planning command governor based scheme: the qball-x4 quadrotor case of study. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), Los Angeles, United States of America (6135-6140),
Conference Date: 2014/12
Paper
Published
Refereed?: Yes, Invited?: No
36. Franzè G, Lucia W, Tedesco F. (2014). A receding horizon scheme for discrete-time polytopic linear parameter varying systems in networked architectures. Journal of Physics: Conference Series. European Workshop on Advanced Control and Diagnosis, Berlin, Germany,
Conference Date: 2014/11
Paper
Published
Refereed?: Yes, Invited?: No
37. Franzè G, Lucia W, Tedesco F, Scordamaglia V. (2014). A distributed obstacle avoidance MPC strategy for leader-follower formations. IFAC Proceedings Volumes (IFAC-PapersOnline). World Congress of the International Federation of Automatic Control (IFAC), Cape Town, South Africa, Republic of (2570-2575),
Conference Date: 2014/8
Paper
Published
Refereed?: Yes, Invited?: No
38. G. Cotugno, W. D'Alfonso, L. and Lucia, P. Muraca, and P. Pugliese. (2013). Extended and unscented kalman filters for mobile robot localization and environment reconstruction. Proceeding of the Mediterranean Conference on Control and Automation. Mediterranean Conference on Control and Automation (MED), ,
Paper
Published
Refereed?: Yes, Invited?: No
39. G. Franze and W. Lucia. (2013). A model predictive control scheme for mobile robotic vehicles in dynamic environments. Proceeding of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), (1575-1582),
Paper
Published
Refereed?: Yes, Invited?: No
40. G. Franze, W. Lucia, and P. Muraca. (2013). An obstacle avoidance receding horizon control scheme for autonomous vehicles. Proceeding of the American Control Conference (ACC). American Control Conference (ACC), (3948-3953),
Paper
Published
Refereed?: Yes, Invited?: No
41. W. Lucia, G. Franze, and P. Muraca. (2013). An obstacle avoidance model predictive control scheme: A sum-of-squares approach. Mediterranean Conference on Control & Automation (MED). Mediterranean Conference on Control & Automation (MED), (1575-1582),
Paper
Published
Refereed?: Yes, Invited?: No

42. Famularo D, Franzè G, Lucia W. (2012). Networked control systems with state, input and communication constraints: A nonlinear approach. Proceedings of the IEEE Conference on Decision and Control. IEEE Conference on Decision and Control (CDC), Maui, United States of America (38-43),
Conference Date: 2012/12
Paper
Published
Refereed?: Yes, Invited?: No
43. D'Alfonso L, Lucia W, Muraca P, Pugliese P. (2011). Filters for mobile robots: EKF, UKF and sensor switching-experimental results. IEEE International Conference on Control and Automation, ICCA. Conference on Control and Automation, Santiago, Chile (925-930),
Conference Date: 2011/12
Paper
Published
Refereed?: Yes, Invited?: No



Protected when completed

Date Submitted: 2024-02-14 13:57:02

Confirmation Number: 1741885

Template: NSERC_Researcher

Dr. Suryadipta Majumdar

Correspondence language: English

Contact Information

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Email

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Dr. Suryadipta Majumdar

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
Bengali	Yes	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	Yes	Yes

Degrees

- 2018/7 Doctorate, Information and Systems Engineering, Concordia University
Supervisors: Lingyu Wang, 2015/1 - 2018/7
- 2014/10 Master's Thesis, Information Systems Security, Concordia University
Supervisors: Mohammad Mannan, 2012/9 - 2014/9
- 2009/10 Bachelor's, Computer Science and Engineering, Bangladesh University of Engineering and Technology (BUET)

Recognitions

- 2023/7 Petro-Canada Young Innovator Award - 10,000
Concordia University
Prize / Award
The Petro-Canada Young Innovator Awards (PCYIA) recognize, promote, and support outstanding and innovative emerging researchers whose work contributes significantly to the training environment of the University and has an impact on society at large.
- 2023/1 - 2024/12 Gina Cody Research and Innovation Fellowship - 40,000
Concordia University
Prize / Award
The Gina Cody Research and Innovation Fellowships aim to support Gina Cody School professors undertaking collaborative research and innovation projects that have significant potential for meaningful partnership with industrial and government agencies.
- 2020/6 The Doctoral Prize in Engineering and Computer Science
Concordia University
Prize / Award
Awarded annually, when merited, to the most deserving graduate of the Doctor of/ Doctorate in Philosophy programs in the Gina Cody School of Engineering and Computer Science. Award is a plaque from the faculty.
- 2020/5 - 2022/4 University at Albany Faculty Research Award - 13,000
University at Albany
Prize / Award
University-wide research award

- 2019/5 Concordia Accelerator Award - 5,000
Concordia University
Prize / Award
This is awarded to the senior outstanding PhD candidates.
- 2018/2 - 2018/5 NSERC Canada Graduate Scholarships - Michael Smith Foreign Study Supplements (CGS-MSFSS) - 6,000
Natural Sciences and Engineering Research Council of Canada (NSERC)
Prize / Award
The Canada Graduate Scholarships – Michael Smith Foreign Study Supplements (CGS-MSFSS) support high-calibre Canadian graduate students in building global linkages and international networks through the pursuit of exceptional research experiences at research institutions abroad. By accessing international scientific research and training, CGS-MSFSS recipients will contribute to strengthening the potential for collaboration between Canadian and foreign institutions.
- 2017/5 - 2019/4 NSERC Alexander Graham Bell Canada Graduate Scholarship-Doctoral (CGS-D) - 70,000
Natural Sciences and Engineering Research Council of Canada (NSERC)
Prize / Award
The Alexander Graham Bell Canada Graduate Scholarship – Doctoral (CGS D) award is offered to the top-ranked applicants who are engaged in an eligible doctoral program in the natural sciences or engineering.
- 2017/5 - 2018/4 Fonds de Recherche du Québec - Nature et Technologies (FRQNT) B2 Scholarship - 20,000
Fonds de recherche du Québec - Nature et technologies (FRQNT)
Prize / Award
The purpose of Fonds de recherche du Québec – Nature et technologies (FRQNT) scholarship programs is to foster student interest in research and to financially assist the best candidates in undertaking or continuing a Master's or Doctoral's program in natural science, mathematics or engineering research. This award was declined by the candidate to hold the NSERC CGS-D award.

User Profile

Research Specialization Keywords: Cloud Computing Security, Cybersecurity, Internet of Things (IoT) Security, Proactive Security, Security Auditing

Employment

- 2023/6 Associate Professor
CIISE, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2020/8 - 2023/5 Assistant Professor
Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University
Full-time, Assistant Professor
Tenure Status: Tenure Track
- Conducting cybersecurity research; - Advising and training both undergraduate and graduate students; - Teaching both undergraduate and graduate courses on computer science and information security; - Serving in several department-level committees; - Organizing workshops and conferences on cybersecurity; - Serving in various conference technical program committee and reviewing journals.

2019/11 - 2020/7	Affiliated Professor Computer Science, Natural Sciences, Colorado State University Part-time Tenure Status: Non Tenure Track
2018/9 - 2020/7	Assistant Professor Information Security and Digital Forensics, Business, University at Albany - State University of New York Full-time, Assistant Professor Tenure Status: Tenure Track - Conducting cybersecurity research; - Advising and training both undergraduate and graduate students; - Teaching both undergraduate and graduate courses on computer science and information security; - Serving in several department-level and school-level committees; - Organizing workshops and conferences on cybersecurity; - Serving in various conference technical program committee and reviewing journals.
2012/9 - 2018/7	Research Assistant Concordia Institute for Information Systems Engineering, ENCS, Concordia University Part-time Tenure Status: Non Tenure Track Research
2013/9 - 2018/5	Teaching Assistant CIISE, ENCS, Concordia University Part-time, Sessional Tenure Status: Non Tenure Track Guest lectures, marking and programmer on duty
2010/6 - 2011/12	Software Engineer Mobile phone commercialization, Samsung R&D Center Software engineering

Research Funding History

Awarded [n=9]

2021/9 - 2026/8 Co-investigator	Security of Defence Products: Evaluations and Countermeasures, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) and Rheinmetall Canada Inc. Mitacs Accelerate Total Funding - 840,000 Portion of Funding Received - 210,000 Funding Competitive?: Yes Co-applicant : Frederic Cuppens; Mohsen Ghafouri; Nora Cuppens
2023/4 - 2026/3 Principal Investigator	Towards Actionable Security Guidelines for IoT Compliance Auditing and Integration with Trustworthiness, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Total Funding - 135,000 Portion of Funding Received - 135,000 Funding Competitive?: Yes Fonds de recherche du Québec - Nature et technologies (FRQNT) Total Funding - 90,000

Portion of Funding Received - 90,000

Funding Competitive?: Yes

Co-investigator : Lianying Zhao; Nadia Tawbi

2023/4 - 2026/3

Principal Investigator

Towards Actionable Security Guidelines for IoT Compliance Auditing and Integration with Trustworthiness, Grant

Funding Sources:

Fonds de recherche du Québec - Nature et technologies (FRQNT)

Total Funding - 36,298

Portion of Funding Received - 36,298

Funding Competitive?: Yes

2021/4 - 2026/3

Principal Investigator

Proactive Security Auditing against AI-enhanced Cyberthreats: from Clouds to Internet of Things (IoT), Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery

Total Funding - 125,000

Portion of Funding Received - 145,000

Funding Competitive?: Yes

2021/5 - 2024/4

Principal Applicant

Proactive Security Auditing against AI- enhanced Cyberthreats: from Clouds to Internet of Things (IoT), Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

DND/NSERC Discovery Grant Supplement

Total Funding - 120,000

Portion of Funding Received - 120,000

Funding Competitive?: Yes

2020/8 - 2022/4

Principal Investigator

Enabling Security Auditing for Internet of Things (IoT), Grant

Funding Sources:

Concordia University

Startup

Total Funding - 50,000

Portion of Funding Received - 50,000

Funding Competitive?: No

2021/4 - 2022/3

Principal Investigator

Proactive Security Auditing against AI-enhanced Cyberthreats: from Clouds to Internet of Things (IoT), Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery Launch Supplement

Total Funding - 12,500

Portion of Funding Received - 12,500

Funding Competitive?: Yes

2018/8 - 2021/7

Principal Investigator

IoT Security Research, Grant

Funding Sources:

University at Albany (State University of New York)

Startup

Total Funding - 39,000

Portion of Funding Received - 39,000

Funding Competitive?: No

2019/7 - 2020/6 Metering the Vulnerability of Diverse Players to Cyberattacks in Internet of Things (IoT),
Principal Investigator Grant

Funding Sources:

State University of New York (New York, USA)
IoT Research Germination Program
Total Funding - 8,500
Portion of Funding Received - 4,000
Funding Competitive?: Yes

Declined [n=1]

2021/4 - 2023/3 AI-Enhanced Security Auditing for Smart Home Networks: From Runtime to Proactive,
Principal Investigator Grant

Funding Sources:

Fonds de recherche du Québec - Nature et technologies (FRQNT)
Total Funding - 110,000
Portion of Funding Received - 0
Funding Competitive?: Yes

Student/Postdoctoral Supervision

Bachelor's [n=5]

2020/1 - 2020/5 Kayla E Ibrahim (Completed) , University at Albany - State University of New York
Principal Supervisor Thesis/Project Title: Towards Defining Actionable Security Rules for verifying IoT Security
Present Position: Student, University at Albany - State University of New York

2019/9 - 2020/5 Jimmy Kong (Completed) , University at Albany - State University of New York
Principal Supervisor Thesis/Project Title: Current Security Threats in Internet of Battle Things (IoBT)
Present Position: Student, University at Albany - State University of New York

2019/1 - 2019/5 Domenic Recchia (Completed) , University at Albany - State University of New York
Principal Supervisor Thesis/Project Title: Identifying potential security threats from IoT devices
Present Position: System Administrator, Setplex

2019/1 - 2020/5 Jivan Ramjisingh (Completed) , University at Albany - State University of New York
Principal Supervisor Thesis/Project Title: Cross-Device Security for IoT Sensors
Present Position: Cybersecurity Consultant, EY

2019/1 - 2019/5 Michael A Cahill (Completed) , University at Albany - State University of New York
Principal Supervisor Thesis/Project Title: Identifying Security-Critical Functionalities in Smart Home Devices
Present Position: Vulnerability Analyst, Department of Defense, USA

Master's Thesis [n=14]

2023/9 - 2025/8 Shafayat Hossain Majumder (In Progress) , Concordia University
Principal Supervisor Student Degree Expected Date: 2025/8
Thesis/Project Title: From Pre-deployment to Post-deployment Security Analysis on Containers
Present Position: Student

2023/9 - 2025/8 Principal Supervisor	Piyush Adhikari (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Security auditing of IoT devices in smart cities Present Position: Student
2023/9 - 2025/8 Principal Supervisor	Sourov Jajodia (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Automation of Cyber Tasks using Large Language Models Present Position: Student
2023/1 - 2024/12 Principal Supervisor	Mahdieh Ghorbanian, Concordia University Thesis/Project Title: Proactive security auditing in IoT Present Position: Student
2022/9 - 2023/12 Co-Supervisor	Jiawei Yao (Completed) , Concordia University Thesis/Project Title: Security recommendation framework for 5G networks Present Position: Student
2022/9 - 2024/8 Co-Supervisor	Alireza Toghyani (In Progress) , Concordia University Thesis/Project Title: Evaluating the usefulness of data augmentation in anomaly detection for IoT Present Position: Student
2022/5 - 2024/4 Principal Supervisor	Armin Mansouri, Concordia University Thesis/Project Title: Security monitoring framework for IoT Present Position: Student
2021/9 - 2023/8 Principal Supervisor	Sofya Smolyakova (In Progress) , Concordia University Student Degree Expected Date: 2023/8 Thesis/Project Title: Quantifying Cyber Risks in IoT Present Position: Student
2021/1 - 2023/9 Principal Supervisor	Shiva Sunar (Completed) , Concordia University Thesis/Project Title: IoT Sensor Failure Detection Present Position: Student
2020/9 - 2022/12 Co-Supervisor	Hugo Kermabon-Bobinnec (Completed) , Concordia University Thesis/Project Title: Proactive security auditing for containers in the cloud Present Position: PhD Student
2020/9 - 2023/8 Co-Supervisor	Mahmood Gholipour (Completed) , Concordia University Thesis/Project Title: Black-box security auditing for network functions virtualization (NFV) Present Position: Student
2020/9 - 2023/12 Co-Supervisor	Sima Bagheri (Completed) , Concordia University Thesis/Project Title: Proactive Security Mitigation for Containers Present Position: Student, Concordia University
2020/9 - 2023/5 Principal Supervisor	Md Wasiuddin Pathan Shuvo (Completed) , Concordia University Thesis/Project Title: Towards runtime security auditing of smart home networks Present Position: Student
2020/2 - 2020/5 Co-Supervisor	Andy Dolan (Completed) , Colorado State University Thesis/Project Title: Proactive Extraction of IoT Device Capabilities for Security Applications Present Position: Senior Security Engineer, CableLabs, USA

Doctorate [n=4]

- 2023/1 - 2026/12
Co-Supervisor Hugo Kermabon-Bobinnec, Concordia University
Thesis/Project Title: Devising proactive mitigation techniques in 5G networks
Present Position: PhD Student
- 2021/9 - 2024/8
Principal Supervisor Ehsan Khodayarsesht (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: Enabling IoT Forensics
Present Position: Student
- 2021/1 - 2024/12
Principal Supervisor Md. Nazmul Hoq (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Protecting against AI-Enhanced IoT Threats
Present Position: Student
- 2020/8 - 2023/8
Co-Supervisor A S M Asadujjaman (In Progress) , Concordia University
Student Degree Expected Date: 2023/8
Thesis/Project Title: Cross-Layer Security Verification for Network Functions Virtualization (NFV)
Present Position: Student

Event Administration

- 2021/11 - 2022/12 Mentor, Individualized Cybersecurity Research Mentoring (iMentor) Workshop 2021, Workshop, 2021/11 - 2021/11
- 2022/4 - 2022/9 Track Co-Chair, 19th Annual International Conference on Privacy, Security, and Trust (PST2022), Conference, 2022/8 - 2022/8
- 2021/12 - 2022/8 Program Co-Chair, 4th International Workshop on Cloud Security and Privacy (CLOUD S&P), Workshop, 2022/6 - 2022/6
- 2021/12 - 2021/12 Session Chair, The Third IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications, Conference, 2021/12 - 2021/12
- 2020/12 - 2021/8 Program Co-Chair, 3rd International Workshop on Cloud Security and Privacy (CLOUD S&P), Workshop, 2021/6 - 2021/6
- 2020/3 - 2021/6 Review Co-Chair, 15th Annual Symposium on Information Assurance (ASIA '20), Conference, 2021/6 - 2021/6
- 2021/2 - 2021/2 Session Chair, Seventeenth Annual IFIP WG 11.9 International Conference on Digital Forensics, Conference, 2021/2 - 2021/2
- 2020/1 - 2020/11 Program Co-Chair, 2nd International Workshop on Cloud Security and Privacy (CLOUD S&P), Workshop, 2020/10 - 2020/10
- 2019/1 - 2019/8 Program Co-Chair, 1st International Workshop on Cloud Security and Privacy (CLOUD S&P), Workshop, 2019/6 - 2019/6
- 2019/3 - 2019/6 Review Co-Chair, 14th Annual Symposium on Information Assurance (ASIA 2019), Conference, 2019/6 - 2019/6

Editorial Activities

- 2022/3 - 2025/4 Associate Editor, Peer-to-Peer Networking and Applications (Springer), Journal
- 2020/7 - 2021/6 Volume Editor, Innovations in Digital Forensics, Book

2020/7 - 2020/12 Guest Editor, IEEE Open Journal of the Communications Society (IEEE OJ-COMS), Journal

International Collaboration Activities

2023/1 - 2028/8 Research Collaborator, United States of America
Collaboration with SFSU

2020/9 - 2025/8 Research Collaborator, Bangladesh
Cybersecurity research with professors and students at Bangladesh University of Engineering and Technology

2022/1 - 2024/12 Research Collaborator, Saudi Arabia
Research on Security of Cloud Native Technologies with the Research Scientist, Resilient Computing and Cybersecurity Center, King Abdullah University of Science and Technology (KAUST)

2019/11 - 2023/8 Research Collaborator, United States of America
A research collaboration with a researcher at National Institute of Standards and Technology (NIST) on Internet of Things (IoT) security

2019/1 - 2023/8 Research Collaborator, United States of America
A research collaboration with a professor and her students at the Colorado State University on Internet of Things (IoT) security

2019/10 - 2023/7 Research Collaborator, Portugal
A research collaboration with a researcher at Bosch Security on Internet of Things (IoT) security

2019/9 - 2023/4 Research Collaborator, United States of America
A research collaboration with a professor at the Illinois Institute of Technology on cloud data privacy.

2019/1 - 2023/4 Research Collaborator, United States of America
A multi-disciplinary research with professors and students from the Psychology and Computer Science departments at the University at Albany.

2018/12 - 2023/4 Research Collaborator, United States of America
A research collaboration with a professor at Thomas Edison State University on moving target defense research for clouds

2020/1 - 2022/8 Research Collaborator, Spain
A research collaboration with a researcher at Telefonica on Software-Defined Network (SDN) security

Committee Memberships

2020/10 - 2021/4 Committee Member, Security Committee, Concordia University
Managing departmental security

2020/10 - 2021/4 Committee Member, Seminar Committee, Concordia University
Organizing research seminars

2020/10 - 2021/4 Committee Member, Supervision Committee, Concordia University
Dealing with the matters related to student supervision

2020/10 - 2021/4 Committee Member, Public Relations Committee, Concordia University
Advertising and maintaining department website

2020/6 - 2021/3	Committee Member, IEEE International Conference on Cyber-Security and Resilience (IEEE CSR 2021), IEEE Reviewing research papers for the conference
2019/11 - 2020/7	Committee Member, Technical Program Committee - IEEE COMPSAC Symposium on Security, Privacy and Trust in Computing (SEPT 2020), IEEE COMPSAC Reviewing research papers for the conference
2019/9 - 2020/7	Committee Member, Teaching and Learning Committee - School of Business, University at Albany - State University of New York
2019/12 - 2020/5	Committee Member, Technical Program Committee - 35th IFIP TC-11 SEC 2020 International Information Security and Privacy Conference, IFIP TC-11 Reviewing research papers for the conference
2019/8 - 2020/2	Committee Member, Technical Program Committee - International Conference on Information Systems Security and Privacy (ICISSP 2020), International Conference on Information Systems Security and Privacy (ICISSP 2020) Reviewing research papers for the conference
2019/5 - 2019/12	Committee Member, Technical Program Committee - Seventh International Symposium on Security in Computing and Communications (SSCC 2019), Seventh International Symposium on Security in Computing and Communications (SSCC 2019) Reviewing research papers for the conference
2019/2 - 2019/11	Committee Member, Technical Program Committee - 12th International Symposium on Foundations & Practice of Security (FPS 2019), 12th International Symposium on Foundations & Practice of Security (FPS 2019) Reviewing research papers for the conference
2019/1 - 2019/7	Committee Member, Technical Program Committee - IEEE Workshop on Security, Trust and Privacy for Software and Application (STPSA 2019), IEEE Reviewing research papers for the conference
2018/12 - 2019/7	Committee Member, Technical Program Committee - IEEE COMPSAC Symposium on Security, Privacy and Trust in Computing (SEPT 2019), IEEE COMPSAC Reviewing research papers for the conference
2019/1 - 2019/6	Committee Member, Technical Program Committee - 34th IFIP TC-11 SEC 2019 International Information Security and Privacy Conference (SEC 2019), IFIP TC-11 Reviewing research papers for the conference
2018/3 - 2018/11	Committee Member, Technical Program Committee - 11th International Symposium on Foundations & Practice of Security (FPS 2018), International Symposium on Foundations & Practice of Security Reviewing research papers for the conference

Other Memberships

2020/7	Journal Reviewer, IEEE Transactions on Cloud Computing (TCC) Reviewing research papers submitted to this journal for publication.
2020/1	Journal Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC) Reviewing research papers submitted to this journal for publication.
2019/12	Journal Reviewer, IEEE Internet of Things Journal Reviewing research papers submitted to this journal for publication.
2019/12	Journal Reviewer, ACM Transactions on Internet Technology (TOIT) Reviewing research papers submitted to this journal for publication

2019/12	Journal Reviewer, IEEE Transactions on Services Computing (TSC) Reviewing research papers submitted to this journal for publication
2019/7	Journal Reviewer, Journal of Cloud Computing Reviewing research papers submitted to this journal for publication
2018/9	Member, Institute of Electrical and Electronics Engineers (IEEE)
2018/5	Journal Reviewer, Elsevier Computer & Security Reviewing research papers submitted to this journal for publication
2017/7	Journal Reviewer, IET Information Security Reviewing research papers submitted to this journal for publication

Presentations

- (2022). Redefining Security Auditing at the Age of Cloud Computing. Distinguished Seminar, Padova, Italy
Invited?: Yes, Keynote?: No
- (2020). Proactive Security Auditing. Research Seminar, Montreal, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No
- (2020). Poster: Defining Actionable Rules for Verifying IoT Safety and Security. 41st IEEE Symposium on Security and Privacy (S&P 2020), San Fransisco, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
- (2019). Proactivizer: Transforming Existing Verification Tools into Efficient Solutions for Runtime Security Enforcement. 24th European Symposium on Research in Computer Security (ESORICS 2019), Luxembourg, Luxembourg
Main Audience: Researcher
Invited?: No, Keynote?: No
- (2019). Proactive Security Auditing for Clouds. Department of Computer Science at the Colorado State University Colloquium series, Fort Collins, United States of America
Main Audience: Researcher
Invited?: Yes, Keynote?: No
- (2019). Multi-Level Proactive Security Auditing for Cloud. IEEE Conference on Dependable and Secure Computing (DSC 2019), Hangzhou, China
Main Audience: Researcher
Invited?: Yes, Keynote?: No
- (2018). Proactive Security Auditing for Clouds. Research Seminar, Albany, United States of America
Main Audience: Researcher
Invited?: Yes, Keynote?: No
- (2018). Cloud Security Auditing: Major Approaches and Existing Challenges. 11th International Symposium on Foundations & Practice of Security (FPS 2018), Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No
- (2018). Stealthy Probing-based Verification (SPV): An Active Approach to Defending Software Defined Networks against Topology Poisoning Attacks. 23rd European Symposium on Research in Computer Security (ESORICS 2018), Barcelona, Spain
Main Audience: Researcher
Invited?: No, Keynote?: No

Broadcast Interviews

2019/04/02 - Expert comments on the ransomware attacks to the Albany City Hall, Local, CBS 6
2019/04/02

Text Interviews

2019/10/03 Digital Forensics Professor Coauthors Book on Improving Cloud Security Auditing,
University at Albany News Center

2019/09/17 Hacking the Smart Home via the Internet of Things, Communications of the ACM

Publications

Journal Articles

1. Momen Oqaily, Mohammad Ekramul Kabir, Suryadipta Majumdar, Yosr Jarraya, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang, and Mourad Debbabi. (2023). iCAT+: An Interactive Customizable Anonymization Tool Using Automated Translation Through Deep Learning. IEEE Transactions on Dependable and Secure Computing (TDSC).
Accepted
Refereed?: Yes
2. Sudershan Lakshmanan, Mengyuan Zhang, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi, Lingyu Wang. (2023). Caught-in-Translation (CiT): Detecting Cross-level Inconsistency Attacks in Network Functions Virtualization (NFV). IEEE Transactions on Dependable and Secure Computing (TDSC).
Accepted
Refereed?: Yes
3. Alaa Oqaily, Md Ekramul Kabir, Sudershan L T, Yosr Jarraya, Suryadipta Majumdar, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang, Mourad Debbabi. (2022). Automatically Verifying the Security of Multilevel Network Functions Virtualization (NFV) Stack. IEEE Transactions on Dependable and Secure Computing (TDSC).
Submitted
Refereed?: Yes
4. Suryadipta Majumdar, Gagandeep Singh Chawla, Yosr Jarrya, Taous Madi, Amir Alimohammadifar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2022). ProSAS: Proactive Security Auditing System for Clouds. IEEE Transactions on Dependable and Secure Computing (TDSC). 19(4)
Published
Refereed?: Yes
5. Gagandeep Singh Chawla, Mengyuan Zhang, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2021). VMGuard: State-based Proactive Verification of Virtual Network Isolation. IEEE Transactions on Dependable and Secure Computing (TDSC). 18(4): 1553 - 1567.
Accepted
Refereed?: Yes, Open Access?: No
6. Momen Oqaily, Yosr Jarraya, Meisam Mohammady, Suryadipta Majumdar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2020). SegGuard: Segmentation-based Anonymization of Network Data in Clouds for Privacy-Preserving Security Auditing. IEEE Transactions on Dependable and Secure Computing (TDSC).
Accepted
Refereed?: Yes, Open Access?: No

7. Lin Zhu, Suryadipta Majumdar, Chinwe Ekenna. (2020). An Invisible Warfare with the Internet of Battlefield Things (IoBT): A Literature Review. *Human Behavior and Emerging Technologies*.
Accepted
Refereed?: Yes
8. Suryadipta Majumdar. (2020). A Multi-Level Proactive Security Auditing Framework for Clouds through Automated Dependency Building. *CCF Transactions on Networking*. 3(2): 112-127.
Published
Refereed?: Yes, Open Access?: No
9. Suryadipta Majumdar, Azadeh Tabiban, Yosr Jarraya, Momen Oqaily, Amir Alimohammadifar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Learning Probabilistic Dependencies among Events for Proactive Security Auditing in Clouds. *Journal of Computer Security (JCS)*. 27(2): 165-202.
Published
Refereed?: Yes, Open Access?: Yes
10. Taous Madi, Yosr Jarraya, Amir Alimohammadifar, Suryadipta Majumdar, Yushun Wang, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). ISOTOP: Auditing Virtual Networks Isolation Across Cloud Layers in OpenStack. *ACM Transactions on Privacy and Security (TOPS)*. 22(1): 1:1-1:35.
Published
Refereed?: Yes, Open Access?: No
11. Suryadipta Majumdar, Taous Madi, Yushun Wang, Yosr Jarrya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). User-level Runtime Security Auditing for Clouds. *IEEE Transactions on Information Forensics and Security (TIFS)*. 13(5): 1185-1199.
Published
Refereed?: Yes, Open Access?: No

Books

1. Suryadipta Majumdar Habib Louafi Sankardas Roy Elias Bou-Harb Andrew Meyer Kurt Friday Lingyu Wang. (2023). *Innovations in Digital Forensics*. (2): 344. Suryadipta Majumdar Paria Shirani Lingyu Wang. Published, World Scientific Publishing
Refereed?: Yes
2. Jianying Zhou, Chuadhry Mujeeb Ahmed, Lejla Batina, Sudipta Chattopadhyay, Olga Gadyatskaya, Chenglu Jin, Jingqiang Lin, Eleonora Losiouk, Bo Luo, Suryadipta Majumdar, Mihalis Maniatakos, Daisuke Mash. (2021). *Applied Cryptography and Network Security Workshops: ACNS 2021 Satellite Workshops, AIBlock, AIHWS, AIoTS, CIMSS, Cloud S&P, SCI, SecMT, and SiMLA, Kamakura, Japan, June 21--24, 2021, Proceedings*. (12809)
Published, Springer
Refereed?: Yes
3. Jianying ZhouMauro ContiChuadhry Mujeeb AhmedMan Ho AuLejla BatinaZhou LiJingqiang LinEleonora LosioukBo LuoSuryadipta MajumdarWeizhi MengMartín OchoaStjepan PicekGeorgios PortokalidisCong WangKehuan Zhang. (2020). *Applied Cryptography and Network Security Workshops: ACNS 2020 Satellite Workshops, AIBlock, AIHWS, AIoTS, Cloud S&P, SCI, SecMT, and SiMLA, Rome, Italy, October 19--22, 2020, Proceedings*. LNCS(12418)
Published, Springer
Refereed?: Yes
4. Suryadipta Majumdar, Taous Madi, Yushun Wang, Azadeh Tabiban, Momen Oqaily, Amir Alimohammadifar, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). [B1] *Cloud Security Auditing*. 1(76)
Published, Springer International Publishing
Refereed?: No

5. Jianying Zhou, Robert H. Deng, Zhou Li, Suryadipta Majumdar, Weizhi Meng, Lingyu Wang, Kehuan Zhang. (2019). Applied Cryptography and Network Security Workshops - ACNS 2019 Satellite Workshops, SiMLA, Cloud S&P, AIBlock, and AIoTS, Bogota, Colombia, June 5-7, 2019, Proceedings. LNCS(11605) Published, Springer
Refereed?: Yes

Conference Publications

1. Hugo Kermabon-Bobindec, Yosr Jarraya, Lingyu Wang, Suryadipta Majumdar and Makan Pourzandi. (2024). Phoenix: Surviving Unpatched Vulnerabilities via Accurate and Efficient Filtering of Syscall Sequences. ISOC. Network and Distributed System Security Symposium (NDSS 2024), Paper
Accepted
Refereed?: Yes, Invited?: No
2. Madeena Sultana, Adrian A Taylor, Li Li, Suryadipta Majumdar. (2023). Towards Evaluation and Understanding of Large Language Models for Cyber Operation Automation. Cyber Resilience Workshop (CRW) at IEEE CNS 2023, Paper
Accepted
Refereed?: Yes, Invited?: No
3. Md Wasiuddin Pathan Shuvo, Md Nazmul Hoq, Suryadipta Majumdar, Paria Shirani. (2023). On Reducing Underutilization of Security Standards by Deriving Actionable Rules: An Application to IoT. 8th Security Standardisation Research (SSR) Conference, Paper
Published
Refereed?: Yes, Invited?: No
4. Sima Bagheri, Hugo Kermabon-Bobindec, Suryadipta Majumdar, Yosr Jarraya, Lingyu Wang, Makan Pourzandi. (2023). Warping the Defence Timeline: Non-disruptive Proactive Attack Mitigation for Kubernetes Clusters. IEEE International Conference on Communications (ICC 2023), Paper
Published
Refereed?: Yes, Invited?: No
5. Md Nazmul Hoq, Jia Wei Yao, Suryadipta Majumdar, Luis Suárez, Lingyu Wang, Makan Pourzandi, Amine Boukhtouta, Mourad Debbabi. (2023). Evaluating the Security Posture of 5G Networks by Combining State Auditing and Event Monitoring. 28th European Symposium on Research in Computer Security (ESORICS), Paper
Accepted
Refereed?: Yes, Invited?: No
6. Momen Oqaily, Suryadipta Majumdar, Lingyu Wang, Mohammad Ekramul Kabir, Yosr Jarraya, A S M Asadujjaman, Makan Pourzandi, Mourad Debbabi. (2023). A Tenant-based Two-stage Approach to Auditing the Integrity of Virtual Network Function Chains Hosted on Third-Party Clouds. 13th ACM Conference on Data and Application Security and Privacy (CODASPY), Paper
Accepted
Refereed?: Yes, Invited?: No
7. Shafayat Hossain Majumder, Sourov Jajodia, Suryadipta Majumdar, Md. Shohrab Hossain. (2023). Layered Security Analysis for Container Images: Expanding Lightweight Pre-Deployment Scanning. 20th International Conference on Privacy, Security, and Trust (PST), Paper
Accepted
Refereed?: Yes, Invited?: No

8. Shafayat Hossain Majumder, Sourov Jajodia, Suryadipta Majumdar, Md. Shohrab Hossain. (2023). Layered Security Analysis for Container Images: Expanding Lightweight Pre-Deployment Scanning. 20th International Conference on Privacy, Security, and Trust (PST), Copenhagen, Denmark
Conference Date: 2023/8
Paper
In Press
Refereed?: Yes, Invited?: No
9. A S M Asadujjaman, Mohammad Ekramul Kabir, Hinddeep Purohit, Suryadipta Majumdar, Lingyu Wang, Yosr Jarraya, Makan Pourzandi. (2022). 5GFIVer: Functional Integrity Verification for 5G Cloud-Native Network Functions. 13th IEEE International Conference on Cloud Computing Technology and Science (CloudCom),
Paper
Published
Refereed?: Yes, Invited?: No
10. Hugo Kermabon-Bobinnec, Mahmood Gholipourchoubeh, Sima Bagheri, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi and Lingyu Wang. (2022). ProSPEC: Proactive Security Policy Enforcement for Containers. 12th ACM Conference on Data and Application Security and Privacy (CODASPY),
Paper
Accepted
Refereed?: Yes, Invited?: No
11. Alaa Oqaily, Yosr Jarraya, Lingyu Wang, Makan Pourzandi, Suryadipta Majumdar. (2022). MLFM: Machine Learning Meets Formal Method for Efficient Security Verification in Network Functions Virtualization (NFV). The 27th European Symposium on Research in Computer Security (ESORICS) 2022, Copenhagen, Denmark
Conference Date: 2022/9
Paper
Accepted
Refereed?: Yes, Invited?: No
12. Tania Tahmina Jui, Md. Nazmul Hoq, Suryadipta Majumdar and Md. Shohrab Hossain. (2021). Feature Reduction through Data Pre-Processing for Intrusion Detection in IoT Networks. Third IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications (TPS),
Conference Date: 2021/12
Paper
Accepted
Refereed?: Yes, Invited?: No
13. Arunavo Dey, Md. Shohrab Hossain, Md. Nazmul Hoq, and Suryadipta Majumdar. (2021). Towards an Attention-based Accurate Intrusion Detection Approach. 17th EAI International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness (QSHINE),
Conference Date: 2021/11
Paper
Accepted
Refereed?: Yes, Invited?: No
14. Upakar Paudel, Andy Dolan, Suryadipta Majumdar and Indrakshi Ray. (2021). Context-Aware IoT Device Functionality Extraction from Specifications for Ensuring Consumer Security. 9th IEEE Conference on Communications and Network Security (CNS 2021),
Conference Date: 2021/10
Paper
Accepted
Refereed?: Yes, Invited?: No

15. A S M Asadujjaman, Momen Oqaily, Yosr Jarraya, Suryadipta Majumdar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2021). Artificial Packet-Pair Dispersion (APPD): A Blackbox Approach to Verifying the Integrity of NFV Service Chains. 9th IEEE Conference on Communications and Network Security (CNS 2021),
Conference Date: 2021/10
Paper
Accepted
Refereed?: Yes, Invited?: No
16. Suryadipta Majumdar, Daniel Bastos and Anoop Singhal. (2021). From High-Level Security Recommendations to Low-Level Actionable Rules to Enable Security Auditing of Smart Home Devices. 17th IFIP WG 11.9 International Conference on Digital Forensics,
Conference Date: 2021/2
Paper
Accepted
Refereed?: Yes, Invited?: No
17. Alaa Oqaily, Sudershan Lakshmanan, Yosr Jarraya, Suryadipta Majumdar, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2020). NFVGuard : Verifying the Security of Multilevel Network Functions Virtualization (NFV) Stack. 12th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2020), Bangkok, Thailand
Conference Date: 2020/12
Paper
Accepted
Refereed?: Yes, Invited?: No
18. Andy Dolan, Indrakshi Ray and Suryadipta Majumdar. (2020). Proactively Extracting IoT Device Capabilities: An Application to Smart Homes. Springer. 34th Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSec 2020), Regensburg, Germany (42-63)
Conference Date: 2020/6
Paper
Published
Refereed?: Yes, Invited?: No
19. Kayla E Ibrahim, Suryadipta Majumdar, Daniel Bastos and Anoop Singhal. (2020). Defining Actionable Rules for Verifying IoT Safety and Security. IEEE. 41st IEEE Symposium on Security and Privacy (S&P 2020), San Fransisco, United States of America
Conference Date: 2020/5
Poster
Published
Refereed?: Yes, Invited?: No
20. Suryadipta Majumdar, Azadeh Tabiban, Meisam Mohammady, Alaa Oqaily, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Multi-Level Proactive Security Auditing for Cloud. IEEE. IEEE Conference on Dependable and Secure Computing (DSC), Hangzhou, China
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: Yes

21. Suryadipta Majumdar, Azadeh Tabiban, Meisam Mohammady, Alaa Oqaily, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Proactivizer: Transforming Existing Verification Tools into Efficient Solutions for Runtime Security Enforcement. Springer. 24th European Symposium on Research in Computer Security (ESORICS 2019), Luxembourg, Luxembourg (239-262)
Conference Date: 2019/9
Paper
Published
Refereed?: Yes, Invited?: No
22. Suryadipta Majumdar, Taous Madi, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). Cloud Security Auditing: Major Approaches and Existing Challenges. Springer International Publishing. 11th International Symposium on Foundations & Practice of Security (FPS 2018), Montreal, Canada
Conference Date: 2018/11
Paper
Published
Refereed?: Yes, Invited?: No
23. Amir Alimohammadifar, Suryadipta Majumdar, Taous Madi, Yosr Jarrya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). Stealthy Probing-based Verification (SPV): An Active Approach to Defending Software Defined Networks against Topology Poisoning Attacks. Springer International Publishing. 23rd European Symposium on Research in Computer Security (ESORICS 2018), Barcelona, Spain (463-484)
Conference Date: 2018/9
Paper
Published
Refereed?: Yes, Invited?: No
24. Abu Asadujjaman, Elisa Rojas, Mohammad Shah Alam and Suryadipta Majumdar. (2018). Fast Control Channel Recovery for Resilient In-band OpenFlow Networks. IEEE. 4th IEEE International Conference on Network Softwarization (NetSoft 2018), Montreal, Canada
Conference Date: 2018/6
Paper
Published
Refereed?: Yes, Invited?: No
25. Azadeh Tabiban, Suryadipta Majumdar, Lingyu Wang and Mourad Debbabi. (2018). PERMON: An OpenStack Middleware for Runtime Security Policy Enforcement in Clouds. IEEE. 4th IEEE Workshop on Security and Privacy in the Cloud (SPC 2018), Beijing, China
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Patents

1. Measuring Security Posture using Combined-Graphs. United States of America. P107379.
Patent Status: Pending
Inventors: Md Nazmul Hoq, Jla Wei Yao, Luis Suárez, Lingyu Wang, Suryadipta Majumdar, Amine Boukhtouta, Makan Pourzandi, Mourad Debbabi

2. Dynamic System Calls-Level Security Defensive System for Containerized Applications Hugo Kermabon-Bobinnec, Mahmood Gholipourchoubeh, Sima Bagheri, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi and Lingyu Wang. United States of America. P105751US01.
Patent Status: Pending
Inventors: Hugo Kermabon-Bobinnec, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi and Lingyu Wang
3. DPOD: Differentially Private Outsourcing of Anomaly Detection. United States of America. P080915WO01. 2020/07/15.
Patent Status: Pending
Inventors: Meisam Mohammady, Suryadipta Majumdar, Yuan Hong, Lingyu Wang, Yosr Jarraya, Makan Pourzandi, Mourad Debbabi, Mengyuan Zhang, Han Wang

Date Submitted: 2024-02-02 16:54:19

Confirmation Number: 1737828

Template: Full CV

Professor Mohammad Mannan

Correspondence language: English

Sex: Male

Date of Birth: 10/10

Canadian Residency Status: Canadian Citizen

Country of Citizenship: Canada

Contact Information

The primary information is denoted by (*)

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Primary Affiliation (*)

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Professor Mohammad Mannan

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes

Degrees

2005/9 - 2009/4	<p>Doctorate, Ph.D. in Computer Science, Computer Science, Carleton University Degree Status: Completed Thesis Title: Authentication and Securing Personal Information in an Untrusted Internet Transferred to PhD without completing Masters?: No Supervisors: Van Oorschot, Paul, 2005/9 - 2009/4 Research Disciplines: Computer Science Areas of Research: Computer Systems Fields of Application: Security</p>
2003/9 - 2005/8	<p>Master's Thesis, Master of Computer Science, Computer Science, Carleton University Degree Status: Completed Thesis Title: Secure Public Instant Messaging Supervisors: Van Oorschot, Paul, 2003/9 - 2005/8 Research Disciplines: Computer Science Areas of Research: Computer Systems Fields of Application: Security</p>
1995/1 - 2000/6	<p>Bachelor's, B.Sc. in Computer Science and Engineering, Computer Science and Engineering, Bangladesh University of Engineering and Technology Degree Status: Completed Thesis Title: A Study on Data Compression Algorithms Supervisors: Kaykobad, Mohammad, 1999/6 - 2000/6</p>

Credentials

2013/4	Professional Engineer, Professional Engineers of Ontario (PEO)
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Recognitions

- 2022/6 Distinguished Paper Award Finalists
IEEE EuroS&P 2022
Distinction
Awarded at the IEEE European Symposium on Security and Privacy (IEEE EuroS&P 2022). The work was done by MASc student *Elgharabawy, M and collaborators from University of Florida.
- 2020/12 Distinguished Paper Award
ACSAC
Distinction
Awarded at the 36th Annual Computer Security Applications Conference (ACSAC 2020) - one of the four Distinguished Papers. The work was done by MASc students *Ali, S, *Elgharabawy, M, and *Duchaussoy, Q.
- 2019/7 Concordia Newsmaker-of-the-week (July/2019)
Concordia University
Distinction
Newsmaker of the Week: "the Concordian or Concordians who've made the greatest media impact based on news outlet prestige and scope of audience."
- 2018/10 Recognition of Service Award from the ACM SIG Governing Board
The Association for Computing Machinery (ACM)
Honor
Awarded for being the Co-Chair (General) of 2018 ACM SIGSAC Conference on Computer and Communications Security (CCS'18).
- 2017/12 Best Paper Award
STAST/ACSAC
Distinction
Awarded at the 7th Workshop on Socio-Technical Aspects in Security and Trust (STAST, co-located with ACSAC 2017). The work was done by MASc students *Mahmoud, M, *Hossen, M, and Barakat, H.
- 2017/5 - 2017/6 Erasmus Mundus NordSecMob Scholar - 5,000 (Euro)
Aalto University, Finland
Prize / Award
Erasmus Mundus is a co-operation and mobility programme, promoting the European Union (EU) as a centre of excellence in higher education. I was selected to guide a few Master's students under this program (mostly at Aalto University).
- 2016/12 Concordia Newsmaker-of-the-week (Dec/2016) (Canadian dollar)
Concordia University
Distinction
Newsmaker of the Week: "the Concordian or Concordians who've made the greatest media impact based on news outlet prestige and scope of audience." Link: <https://www.concordia.ca/news/concordia-in-the-news/newsmakers/cunews/main/items/2016/12/5/newsmaker.html>
- 2016/5 Concordia Newsmaker-of-the-week (May/2016)
Concordia University
Distinction
Newsmaker of the Week: "the Concordian or Concordians who've made the greatest media impact based on news outlet prestige and scope of audience." Link: <http://www.concordia.ca/cunews/main/items/2016/05/09/newsmaker.html>

- 2015/10 Recognition of "Outstanding Service" as the Local Arrangement Chair for an IEEE conference.
IEEE
Honor
Awarded for being the Local Arrangement Chair of IEEE 34th Symposium on Reliable Distributed Systems (SRDS).
- 2015/3 Concordia Newsmaker-of-the-week (March/2015)
Concordia University
Distinction
Link: <http://www.concordia.ca/news/concordia-in-the-news/news/concordia-in-the-news/newsmakers/cunews/main/items/2015/03/27/MohammadMannan.html>
- 2014/5 - 2014/7 Spotlight paper of IEEE Transactions on Dependable and Secure Computing (TDSC) at the TDSC portal: <http://www.computer.org/portal/web/tdsc> (Canadian dollar)
IEEE Computer Society
Distinction
Our paper was accepted for a special TDSC issue on mobile security, and it was selected as the spotlight paper for two months (May/June 2014).

User Profile

Researcher Status: Researcher

Research Specialization Keywords: Authentication, Malware and binary analysis, Mobile device security and privacy, Operating Systems security, Privacy analysis frameworks, Trusted computing, Usable security

Disciplines Trained In: Computer Science, Computer Engineering and Software Engineering

Research Disciplines: Computer Science

Areas of Research: Computer Systems, Information Systems, Software Development

Fields of Application: Security

Employment

- 2023/6 Professor
Concordia Institute for Information Systems Engineering, Concordia University
Full-time, Professor
Tenure Status: Tenure
- 2016/5 Fellow
TandemLaunch Inc. (Montreal, Canada)
Technology consultant at TandemLaunch Inc., a venture capital & private equity company based in Montreal, Canada. My contract is for occasional evaluation of new technology proposals received by TandemLaunch. This work has no direct relationship with my research program.
- 2016/6 - 2023/5 Associate Professor
Concordia Institute for Information Systems Engineering (CIISE), Engineering and Computer Science, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure

2018/3 - 2018/4	Visiting Professor Cyber Physical Security Research Center, The National Institute of Advanced Industrial Science and Technology (AIST), Japan Full-time, Visiting Professorship Tenure Status: Non Tenure Track
2018/2 - 2018/3	Visiting Professor Computer Science, University of Waterloo Full-time, Visiting Professorship Tenure Status: Non Tenure Track
2018/1 - 2018/2	Visiting Professor Electrical and Computer Engineering, University of Toronto Full-time, Visiting Professorship Tenure Status: Non Tenure Track
2017/9 - 2017/12	Visiting Professor Computer Science, ETH Zurich, Switzerland Full-time, Visiting Professorship Tenure Status: Non Tenure Track
2017/5 - 2017/6	Visiting Professor Computer Science, Espoo, Aalto University, Finland Full-time, Visiting Professorship Tenure Status: Non Tenure Track
2011/7 - 2016/5	Assistant Professor Concordia Institute for Information Systems Engineering (CIISE), Engineering and Computer Science, Concordia University Full-time, Assistant Professor Tenure Status: Tenure Track
2009/7 - 2011/6	NSERC/ISSNet Post-doctoral Fellow Electrical and Computer Engineering, University of Toronto Full-time Tenure Status: Non Tenure Track
2009/5 - 2009/6	Post-doctoral Research Associate Computer Science, Carleton University Full-time Tenure Status: Non Tenure Track
2001/6 - 2003/9	Software Developer Research and Development, Eyeball Networks Inc. (Vancouver, Canada)
2000/8 - 2001/5	Software Developer Software, TigerIT Inc. (Dhaka, Bangladesh)
1997/1 - 2000/7	Instructor Educational and training services, IBCS-Primax Software (BD) Ltd., Dhaka, Bangladesh Part-time Tenure Status: Non Tenure Track

Affiliations

The primary affiliation is denoted by (*)

(*) 2011/7 Assistant Professor, Concordia Institute for Information Systems Engineering (CIISE),
Concordia University

Research Funding History

Awarded [n=4]

2023/8 - 2024/3 Privacy Analysis of VR/AR Online Shopping Applications, Grant

Principal Investigator

Funding Sources:

Office of the Privacy Commissioner of Canada
Contributions Program
Total Funding - 35,450
Portion of Funding Received - 35,450
Funding Competitive?: Yes

Co-investigator : Amr Youssef

2019/9 - 2023/12 Cross Layer Security Mechanisms: From Design to Integration within Ultra-Dense

Principal Investigator Virtualized Radio Access Net, Grant

Funding Sources:

Ericsson Research Canada
Mitacs Accelerate Cluster
Total Funding - 146,666
Portion of Funding Received - 80,000
Funding Competitive?: Yes

2017/5 - 2023/4 Data Security through Trusted Execution and Comprehensive Analysis Framework, Grant,
Principal Investigator Operating

Funding Sources:

2017/5 - 2022/4 Natural Sciences and Engineering Research Council of Canada
(NSERC)
Discovery Grant
Total Funding - 138,000 (Canadian dollar)
Portion of Funding Received - 138,000
Funding Competitive?: Yes

2022/6 - 2023/3 Privacy Analysis of Technologies Used in Intimate Partner Abuse, Grant

Principal Investigator

Funding Sources:

Office of the Privacy Commissioner of Canada
Contributions Program
Total Funding - 26,716
Portion of Funding Received - 13,358
Funding Competitive?: Yes

Co-investigator : Amr Youssef

Completed [n=17]

2021/5 - 2022/3 Privacy Report Card for Online Solutions Targeting Seniors, Grant

Principal Investigator

Funding Sources:

Office of the Privacy Commissioner of Canada
Contributions Program
Total Funding - 49,740
Portion of Funding Received - 24,870
Funding Competitive?: Yes

Co-investigator : Amr Youssef

- 2020/5 - 2021/8
Principal Investigator
- Detecting Advanced Phishing and Malicious Websites, Grant
- Funding Sources:**
- Canadian Internet Registration Authority
 - Community Investment Program
 - Total Funding - 45,500
 - Portion of Funding Received - 22,750
 - Funding Competitive?: Yes
- Co-investigator : Amr Youssef
- 2018/9 - 2019/10
Principal Investigator
- Safety and Security for Connected and Autonomous Vehicles, Grant
- Funding Sources:**
- Irdeto Canada
 - Mitacs Accelerate Cluster
 - Total Funding - 40,000
 - Portion of Funding Received - 40,000
 - Funding Competitive?: Yes
- 2018/5 - 2019/4
Principal Investigator
- A Global View on Web Tracking and TLS Anomalies, Grant
- Funding Sources:**
- Canadian Internet Registration Authority
 - Community Investment Program
 - Total Funding - 43,150
 - Portion of Funding Received - 21,575
 - Funding Competitive?: Yes
- Co-investigator : Amr Youssef
- 2018/4 - 2019/3
Principal Investigator
- Privacy Leakage in Canadian Public Wi-Fi Networks, Grant
- Funding Sources:**
- Office of the Privacy Commissioner of Canada
 - Contributions Program
 - Total Funding - 58,391
 - Portion of Funding Received - 29,195
 - Funding Competitive?: Yes
- Co-investigator : Amr Youssef
- 2014/6 - 2017/5
Principal Investigator
- ARRE Project on Speaker Series and Workshop in Security, Grant, Workshop
- Funding Sources:**
- 2014/6 - 2017/5
 - Concordia University
 - Aid to Research Related Events, Publication, Exhibition and Dissemination Activities
 - Total Funding - 5,000 (Canadian dollar)
 - Portion of Funding Received - 5,000
 - Funding Competitive?: Yes
- 2012/5 - 2017/4
Principal Investigator
- Security and Privacy of High Impact Computer Applications, Grant, Operating
- Project Description: The proposed research focuses on three goals: (a) leverage existing and newly introduced hard- ware security features to enhance the foundation of low-level system software layers to better sup- port security-critical applications; (b) design privacy-preserving architectures and techniques given that users will continue exchanging data through cloud-based services; (c) deal with the "unmotivated user" problem by integrating security/privacy mechanisms with the functioning of the system itself. Overall,

the proposed research addresses important privacy concerns of today's digital citizens, offers high-assurance techniques for businesses and government agencies, and helps increase trustworthiness of computing systems.

Funding Sources:

2012/5 - 2017/4 Natural Sciences and Engineering Research Council of Canada (NSERC)
Discovery Grant
Total Funding - 110,000 (Canadian dollar)
Portion of Funding Received - 110,000 (Canadian dollar)
Funding Competitive?: Yes

Funding by Year:

2012/4 - 2017/4 Total Funding - 110,000
Portion of Funding Received - 44,000
Time Commitment: 25

2016/4 - 2017/3 Privacy Report Card for Children's Smart Toys, Grant, Operating
Principal Investigator

Funding Sources:

2017/4 - 2018/3 Office of the Privacy Commissioner of Canada
Contributions Program
Total Funding - 49,767 (Canadian dollar)
Portion of Funding Received - 24,883
Funding Competitive?: Yes

Co-investigator : Amr Youssef

2016/6 - 2016/9 WebAssembly Evaluation for Software Protection, Grant
Principal Investigator

Funding Sources:

2016/6 - 2016/9 Mathematics of Information Technology and Complex Systems (MITACS)
Mitacs Accelerate Program (Irdeto Canada)
Total Funding - 15,000 (Canadian dollar)
Portion of Funding Received - 15,000
Funding Competitive?: Yes

2013/8 - 2016/7 Software Fingerprinting for Automated Malicious Code Analysis, Grant, Operating
Co-investigator

Funding Sources:

2013/8 - 2016/7 Natural Sciences and Engineering Research Council of Canada (NSERC)
DND/NSERC Research Partnership Project (DNDPJ)
Total Funding - 641,739 (Canadian dollar)
Portion of Funding Received - 54,243
Funding Competitive?: Yes

Funding by Year:

2013/8 - 2016/7 Total Funding - 641,739
Portion of Funding Received - 16,000
Time Commitment: 20

Co-investigator : Amr Youssef; Benjamin Fung; Lingyu Wang;

Principal Investigator : Mourad Debbabi

2015/12 - 2016/5 Analysis of Linux Container-based Security Mechanisms, Grant
Principal Investigator

Funding Sources:

2015/12 - 2016/5 Natural Sciences and Engineering Research Council of Canada (NSERC)
 NSERC Engage Grant (Huawei Canada)
 Total Funding - 25,000 (Canadian dollar)
 Portion of Funding Received - 25,000
 Funding Competitive?: Yes

2015/4 - 2016/3
 Co-investigator

Certificate Authority Report Card: Examining the Root of Data Protection on the Web, Grant

Funding Sources:

2015/4 - 2016/3 Office of the Privacy Commissioner of Canada
 Contributions Program
 Total Funding - 49,225 (Canadian dollar)
 Portion of Funding Received - 13,000
 Funding Competitive?: Yes

Principal Investigator : Jeremy Clark

2013/4 - 2015/3
 Principal Investigator

Data Security and Privacy in Mobile Devices, Grant, Operating
 Clinical Research Project?: No

Project Description: To restrict unwanted access, all major mobile OS manufacturers include some level of storage encryption. However, encrypting user data may be inadequate in situations where users may be coerced into disclosing their decryption keys. Deniable encryption techniques have been devised to address this specific problem in the desktop environment. We argue that deniable storage encryption is more important for mobile devices as these devices are more widely used and portable than laptops or desktops. Another avenue for data leakage is through the use of mobile applications (apps), requiring access to privacy-sensitive system resources, e.g., camera, microphone, and GPS; these apps may leak information to third parties while the user remains unaware. The proposed research focuses on: (a) design and implement a deniable storage encryption system that can address challenges specific to m

Funding Sources:

2013/4 - 2015/3 Fonds de recherche du Québec - Nature et technologies (FRQNT)
 New researchers start up program
 Total Funding - 45,286 (Canadian dollar)
 Portion of Funding Received - 45,286 (Canadian dollar)
 Funding Renewable?: No
 Funding Competitive?: Yes

Funding by Year:

2013/4 - 2015/4 Total Funding - 40,000 (Canadian dollar)
 Portion of Funding Received - 20,000 (Canadian dollar)
 Time Commitment: 20

2013/4 - 2015/4 Total Funding - 5,286 (Canadian dollar)
 Portion of Funding Received - 5,286 (Canadian dollar)
 Time Commitment: 0

2011/7 - 2014/4
 Principal Investigator

Securing User-to-User Authentication in IM/Web Applications, Grant

Funding Sources:

2011/7 - 2014/4 Concordia University
 Start-up Funds (ENCS)
 Total Funding - 50,000 (Canadian dollar)
 Portion of Funding Received - 50,000
 Funding Competitive?: No

Funding by Year:

2011/7 - 2014/4 Total Funding - 50,000
 Portion of Funding Received - 50,000
 Time Commitment: 25

2012/9 - 2013/2 Network Security in the Age of Smartphone Malware, Grant, Operating
 Principal Investigator

Funding Sources:

2012/9 - 2013/2 Natural Sciences and Engineering Research Council of Canada
 (NSERC)
 NSERC Engage Program (Irdeto Canada)
 Total Funding - 24,200 (Canadian dollar)
 Portion of Funding Received - 24,200
 Funding Competitive?: Yes

Funding by Year:

2012/9 - 2013/2 Total Funding - 24,200
 Portion of Funding Received - 24,200
 Time Commitment: 20

2009/7 - 2011/6 NSERC ISSNet Postdoctoral Fellowship, Fellowship
 Principal Applicant

Funding Sources:

2009/7 - 2011/6 NSERC ISSNet
 Postdoctoral Fellowship
 Total Funding - 74,500 (Canadian dollar)
 Portion of Funding Received - 74,500 (Canadian dollar)
 Funding Competitive?: Yes

2010/5 - 2011/6 NSERC Postdoctoral Fellowship, Fellowship
 Principal Applicant

Funding Sources:

2010/5 - 2011/6 Natural Sciences and Engineering Research Council of Canada
 (NSERC)
 Postdoctoral Fellowship
 Total Funding - 80,000 (Canadian dollar)
 Portion of Funding Received - 46,666 (Canadian dollar)
 Funding Competitive?: Yes

Funding by Year:

2006/5 - 2009/4 Total Funding - 80,000
 Portion of Funding Received - 46,666
 Time Commitment: 80

Student/Postdoctoral Supervision

Bachelor's [n=7]

2021/5 - 2021/8 Principal Supervisor	Guan, Chelsea (Completed) , Concordia University Thesis/Project Title: Detecting advanced phishing and malicious websites Present Position: Unknown
2021/5 - 2021/8 Principal Supervisor	Slimi, Adam (Completed) , ENSTA (National School of Advanced Techniques), Paris, France Thesis/Project Title: Certificate analysis in TOR Onion sites Present Position: Unknown
2019/5 - 2019/8 Principal Supervisor	Brillant-Giroux, Simon (Completed) , Concordia University Thesis/Project Title: Permission usage contextuality of Android apps Present Position: Software developer, Amazon AWS
2019/5 - 2019/8 Principal Supervisor	Fleurant, Nohan (Completed) , Concordia University Thesis/Project Title: Permission usage contextuality of Android apps Present Position: Software developer, INEAT Group
2016/5 - 2016/8 Principal Supervisor	Fisher, Philippe (Completed) , Concordia University Student Degree Start Date: 2016/1 Thesis/Project Title: End-to-end Encryption in Cloud-based Services (NSERC USRA Intern) Present Position: Software Developer, Broadsign
2016/5 - 2016/8 Principal Supervisor	Proctor-Shah, Sebastian (Completed) , Concordia University Student Degree Start Date: 2016/1 Thesis/Project Title: Tracking Privacy-sensitive Resource Usage in Android (NSERC USRA Intern) Present Position: Unknown
2014/6 - 2014/9 Principal Supervisor	Isler, Devris (Completed) , Zirve University, Turkey Student Degree Start Date: 2014/6 Thesis/Project Title: Secure Email for a Multi-platform Environment (Mitacs Globalink Intern) Present Position: Unknown

Master's non-Thesis [n=4]

2020/9 - 2020/12 Principal Supervisor	Adhikari, Aashish (Completed) , Concordia University Thesis/Project Title: Privacy Exposure in Online Government Services Present Position: Platform Engineer, Manulife
2018/9 - 2018/12 Co-Supervisor	Philbert, Alexandre (Completed) , Concordia University Thesis/Project Title: State of DNS Privacy Present Position: Unknown
2018/5 - 2018/8 Principal Supervisor	Omar, Munzir (Completed) , Concordia University Thesis/Project Title: Privacy Leakage of Public Wi-Fi Hotspot Present Position: Unknown
2016/1 - 2016/4 Principal Supervisor	Samarasinghe, Nayanamana (Completed) , Concordia University Student Degree Start Date: 2015/5 Thesis/Project Title: Security in Internet of Things (IoT) devices Present Position: Engineer (Associate), Enterprise Infrastructure, Morgan Stanley

Master's Thesis [n=39]

2023/9 - 2025/8 Co-Supervisor	Tariq Houis (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Security Analysis of Fleet Management Systems Present Position: Research Assistant, Concordia University
2023/9 - 2025/8 Co-Supervisor	Fahimeh Rezaei (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Privacy issues in single-sign on systems Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Principal Supervisor	Mangeard, Philippe (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Principal Supervisor	Alam, Ajmain (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Principal Supervisor	Maheshwari, Adivardhan (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Co-Supervisor	Sun, Xin (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Co-Supervisor	Ragab, Abdelrahman (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/9 - 2024/8 Principal Supervisor	Lamisa, Kazi Farhat (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: To be determined Present Position: Research Assistant, Concordia University
2022/1 - 2023/12 Principal Supervisor	Baskaran, Supraja (In Progress) , Concordia University Thesis/Project Title: JavaScript vulnerabilities in mobile apps Present Position: Research Assistant, Concordia University
2021/9 - 2023/8 Principal Supervisor	Yu, Xiufen (Completed) , Concordia University Thesis/Project Title: Privacy Analysis of Technological Solutions Designed for Victims of Intimate Partner Abuse Present Position: Research Assistant, Concordia University
2021/9 - 2023/8 Co-Supervisor	Mohammadi, Hamed (In Progress) , Concordia University Thesis/Project Title: Evaluation of smart-contract vulnerability assessment tools Present Position: Research Assistant, Concordia University
2021/5 - 2023/1 Principal Supervisor	Pagey, Rohan (Completed) , Concordia University Thesis/Project Title: Security Weaknesses in E-commerce Platforms Present Position: Product Security Analyst, HackerOne

2021/5 - 2022/8 Principal Supervisor	Ramez Al Aghbar (In Progress) , Concordia University Student Degree Expected Date: 2022/8 Thesis/Project Title: Security and Privacy Analysis of Online Gaming Platforms Present Position: Research Assistant, Concordia University
2021/5 - 2022/8 Principal Supervisor	Rabotka, Vladimir (In Progress) , Concordia University Student Degree Start Date: 2013/1 Student Degree Expected Date: 2022/8 Student Canadian Residency Status: Canadian Citizen Thesis/Project Title: Characterizing Malware in Behaviors through Dynamic Analysis Present Position: Unknown
2021/1 - 2023/1 Principal Supervisor	Tejaswi, Bhaskar (Completed) , Concordia University Thesis/Project Title: Security Weaknesses in IoT Management Platforms Present Position: Application Security Specialist, OneSpan
2020/9 - 2022/8 Co-Supervisor	Brendan Wood (In Progress) , Concordia University Student Degree Expected Date: 2022/8 Thesis/Project Title: Security Analysis of Autonomic Networking Protocols and Solutions Present Position: Research Assistant, Concordia University
2020/9 - 2022/7 Principal Supervisor	Kluban, Maryna (Completed) , Concordia University Thesis/Project Title: Detection of Vulnerable JavaScript Functions in Real-World Applications Present Position: Cybersecurity consultant
2020/9 - 2022/8 Co-Supervisor	Pranay Kapoor (Completed) , Concordia University Thesis/Project Title: Security and Privacy Analysis of Online Solutions for Seniors Present Position: Full Stack Engineer (Digital Identity Security), Thales Group
2020/1 - 2022/4 Co-Supervisor	Salehi, Mehdi (Completed) , Concordia University Thesis/Project Title: An Analysis of Upgradeability, Oracles, and Stablecoins in the Ethereum Blockchain Present Position: Blockchain developer, Offchain Labs
2019/9 - 2021/9 Principal Supervisor	Elgharabawy, Mounir (Completed) , Concordia University Thesis/Project Title: Cross-vendor Security Analysis of Android Unix Domain Sockets Present Position: AV Engine Developer, Fortinet
2019/9 - 2021/12 Co-Supervisor	Shobiri, Behnam (Completed) , Concordia University Thesis/Project Title: CDNs' Dark Side: Identifying Security Problems in CDN-to-Origin Present Position: Security Researcher, Tigera
2019/5 - 2021/8 Co-Supervisor	Uddin, Md. Shahab (Completed) , Concordia University Thesis/Project Title: HORUS: A Security Assessment Framework for Android Crypto Wallets Present Position: Information Security Analyst, Lowe's Canada
2019/1 - 2020/9 Principal Supervisor	Osman, Tousif (Completed) , Concordia University Thesis/Project Title: AppVeto: Securing Android Applications through Resource Access Veto Present Position: Software Engineer, Morningstar Research Inc.
2019/1 - 2020/11 Principal Supervisor	Duchaussoy, Quentin (Completed) , Concordia University Thesis/Project Title: Security and Privacy Analysis of Parental Control Solutions Present Position: Security Engineer, AMOSSYS, France
2018/9 - 2021/3 Co-Supervisor	Safaie, Tina (Completed) , Concordia University Thesis/Project Title: ByPass: Reconsidering the Usability of Password Managers Present Position: Information Security Analyst, GENAIZ

- 2018/9 - 2020/5
Principal Supervisor Ali, Suzan (Completed) , Concordia University
Thesis/Project Title: A Large-Scale Evaluation of Privacy Practices of Public Wifi Captive Portals
Present Position: Cyber Security Instructor, University of Doha
- 2017/9 - 2020/9
Principal Supervisor Jafari, Mina (Completed) , Concordia University
Thesis/Project Title: Measuring the Effectiveness of Microsoft Authenticode: A Systematic Analysis of Signed Freeware
Present Position: Security Engineer, SAP Canada
- 2016/9 - 2018/12
Principal Supervisor Hossen, Zakir Md. (Completed) , Concordia University
Student Degree Start Date: 2016/9
Thesis/Project Title: On Understanding Permission Usage Contextuality of Android Apps
Present Position: Android Engineer, Amazon
- 2016/9 - 2018/8
Principal Supervisor Fisher, Philippe (In Progress) , Concordia University
Student Degree Start Date: 2016/9
Student Degree Expected Date: 2018/8
Thesis/Project Title: Analyzing OS Mechanisms for Protecting Anti-Ransomware Processes
- 2015/9 - 2017/8
Principal Supervisor Lew, Scott (In Progress) , Concordia University
Student Degree Start Date: 2015/9
Student Degree Expected Date: 2017/8
Thesis/Project Title: Security Analysis of Containerization Technologies
Present Position: Service Desk Manager, Appnovation Technologies, Montreal
- 2014/9 - 2016/12
Co-Supervisor Khanna, Abhimanyu (Completed) , Concordia University
Student Degree Start Date: 2014/9
Student Degree Received Date: 2017/4
Thesis/Project Title: Towards Usable and Fine-grained Security for HTTPS with Middleboxes
Present Position: Senior Consultant, Deloitte Canada
- 2014/1 - 2016/8
Principal Supervisor Mondal, Briti Sundar (Completed) , Concordia University
Student Degree Start Date: 2014/1
Student Canadian Residency Status: Study Permit
Thesis/Project Title: Bintype: A Scalable Type Inference Tool for Compiled C Programs
Present Position: Software Engineer, Meta/Facebook
- 2014/1 - 2016/3
Principal Supervisor Shahkar, Arash (Completed) , Concordia University
Student Degree Start Date: 2014/1
Student Canadian Residency Status: Study Permit
Thesis/Project Title: On Matching Binary to Source Code
Present Position: Software Engineer, Carta
- 2014/1 - 2016/12
Principal Supervisor Khanna, Parul (Completed) , Concordia University
Student Degree Start Date: 2014/1
Student Degree Received Date: 2017/4
Student Canadian Residency Status: Study Permit
Thesis/Project Title: Detecting Privacy Leaks Through Existing Android Frameworks
Present Position: Vice President - Cyber Security, BNP Paribas
- 2013/5 - 2014/4
Principal Supervisor de Carné de Carnavalet, Xavier (Completed) , Concordia University
Student Degree Start Date: 2013/5
Student Degree Received Date: 2014/4
Student Canadian Residency Status: Study Permit
Thesis/Project Title: A Large-scale Evaluation of High-impact Password Strength Meters
Present Position: Ph.D. student, Concordia University

- 2012/9 - 2014/8
Principal Supervisor Majumdar, Suryadipta (Completed) , Concordia University
Student Degree Start Date: 2012/9
Student Degree Received Date: 2014/8
Thesis/Project Title: On End-to-end Encryption for Cloud-based Services
Present Position: Ph.D. student, Concordia University
- 2012/9 - 2013/12
Co-Supervisor Kara, Abdullah Mert (Completed) , Concordia University
Student Degree Start Date: 2012/9
Student Degree Received Date: 2013/12
Thesis/Project Title: Malicious Payload Distribution Channels in Domain Name System
Present Position: Software Developer, Ericsson Canada

Other Supervisors: Co-Supervisor - Debbabi, Mourad
- 2011/9 - 2013/8
Principal Supervisor Saberi Pirouz, Atieh (Completed) , Concordia University
Student Degree Start Date: 2011/9
Student Degree Received Date: 2013/8
Thesis/Project Title: Securing Email Through Online Social Networks
Present Position: Software Engineer, ComboTrip.com (US)
- 2011/9 - 2013/4
Principal Supervisor Skillen, Adam (Completed) , Concordia University
Student Degree Start Date: 2011/9
Student Degree Received Date: 2013/4
Thesis/Project Title: Deniable Storage Encryption for Mobile Devices
Present Position: IT Security Analyst, CGI, Ottawa, Canada
- Doctorate [n=5]**
- 2020/9 - 2024/8
Principal Supervisor Pourali, Sajjad (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: Detection of Hidden Communication Channels
Present Position: Research Assistant, Concordia University
- 2020/5 - 2021/12
Co-Supervisor Mahmoud, Moustafa (Withdrawn) , Concordia University
Thesis/Project Title: Early Stage Detection of Advanced Persistent Malware
Present Position: Technical Lead - Production Security Incident Response, BNP Paribas
- 2017/9 - 2022/11
Principal Supervisor Samarasinghe, Nayanamana (Completed) , Concordia University
Thesis/Project Title: Measuring for privacy: From tracking to cloaking
Present Position: Application Performance Specialist, Morgan Stanley
- 2014/5 - 2019/7
Principal Supervisor de Carné de Carnavalet, Xavier (Completed) , Concordia University
Student Degree Start Date: 2014/5
Thesis/Project Title: Last-Mile TLS Interception: Analysis and Observation of the Non-Public HTTPS Ecosystem
Present Position: Assistant professor, Hong Kong Polytechnic University
- 2013/1 - 2018/7
Principal Supervisor Zhao, Lianying (Completed) , Concordia University
Student Degree Start Date: 2013/1
Student Canadian Residency Status: Study Permit
Thesis/Project Title: Authentication and Data Protection under Strong Adversarial Model
Present Position: Assistant professor, Carleton University, Ottawa, Canada

Event Administration

- 2020/6 - 2020/12
Publications Chair, New Security Paradigms Workshop (NSPW 2020), Workshop, 2020/10 - 2020/10

2019/6 - 2019/12	Publications Chair, New Security Paradigms Workshop (NSPW 2019), Workshop, 2019/9 - 2019/9
2018/6 - 2018/12	Publications Chair, New Security Paradigms Workshop (NSPW 2018), Workshop, 2018/8 - 2018/8
2017/9 - 2018/12	General co-Chair, The 25th ACM Conference on Computer and Communications Security (ACM CCS 2018), Conference, 2018/10 - 2018/10
2017/6 - 2017/12	Publications Chair, New Security Paradigms Workshop (NSPW 2017), Workshop, 2017/10 - 2017/10
2011/9 - 2017/9	Principal Organizer, Security, privacy and forensics (SPF) seminar at Concordia (bi-weekly, ongoing), Seminar, 2011/9 - 2017/9
2016/6 - 2016/12	Publications Chair, New Security Paradigms Workshop (NSPW 2016), Workshop, 2016/9 - 2016/9
2016/5 - 2016/12	Program Co-chair, ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM 2016), Workshop, 2016/10 - 2016/10
2016/10 - 2016/10	Session Chair, Session: "Network security I" in ACM Conference on Computer and Communications Security (CCS 2016), Conference, 2016/10 - 2016/10
2015/6 - 2015/12	Publications Chair, New Security Paradigms Workshop (NSPW 2015), Workshop, 2015/9 - 2015/9
2015/4 - 2015/10	Local Arrangements Chair, Symposium on Reliable Distributed Systems (SRDS 2015), Conference, 2015/9 - 2015/10
2014/1 - 2014/9	Publicity Chair, New Security Paradigms Workshop (NSPW 2014), Workshop, 2014/9 - 2014/9
2010/2 - 2010/4	Local Organizer, Program committee meeting for USENIX Security 2010, Conference, USENIX Association, 2010/4 - 2010/4

Editorial Activities

2020/6 - 2024/5	Associate Editor, IEEE Security & Privacy, Journal
2022/9 - 2023/4	Member, Technical Program Committee, ACM Asia Conference on Computer and Communications Security (ASIACCS 2023), Conference Abstract
2022/5 - 2022/6	Reviewer, IEEE Transactions on Information Forensics & Security (TIFS), Journal
2021/7 - 2022/6	Member, Technical Program Committee, USENIX Security Symposium 2022, Conference Abstract
2021/1 - 2021/12	Reviewer, IEEE Transactions on Information Forensics and Security (TIFS), Journal
2021/1 - 2021/12	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal
2020/1 - 2020/12	Reviewer, IEEE Transactions on Technology and Society, Journal
2019/9 - 2020/8	Guest Co-Editor, IEEE Security & Privacy, Special issue on Hardware-assisted Security 2020, Journal
2020/5 - 2020/7	Member, Technical Program Committee, EAI Security and Privacy in Communication Networks, SecureComm 2020, Conference Abstract
2019/1 - 2019/12	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal
2019/1 - 2019/12	Reviewer, IEEE Access, Journal
2019/1 - 2019/12	Reviewer, IEEE Internet Computing, SI: Meaning of Identity on the Internet, Journal

2019/1 - 2019/12	Reviewer, IEEE IEEE Security & Privacy, SPSI: Internet of Things (IoT) Security and Privacy, Journal
2019/1 - 2019/12	Reviewer, IEEE Transactions on Network and Service Management (TNSM), Journal
2019/5 - 2019/10	Member, Technical Program Committee, ACM Conference on Computer and Communications Security (ACM CCS) 2019, Conference Abstract
2018/1 - 2018/12	Reviewer, Journal of Information and Telecommunication, Journal
2018/1 - 2018/12	Reviewer, Elsevier Computers & Security, Journal
2018/2 - 2018/5	Member, Technical Program Committee, USENIX Security Symposium 2018, Conference Abstract
2017/12 - 2018/3	Member, Technical Program Committee, ACM Asia Conference on Computer and Communications Security (ASIACCS) 2018, Conference Abstract
2017/1 - 2017/12	Reviewer, IEEE Transactions on Information Forensics and Security (TIFS), Journal
2017/1 - 2017/12	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal
2017/9 - 2017/11	Member, Technical Program Committee, Workshop on Socio-Technical Aspects of Security and Trust (STAST) 2017, Conference Abstract
2017/9 - 2017/10	Member, Technical Program Committee, North America Applied Research Competition (CSAW) 2017, Conference Abstract
2017/6 - 2017/8	Member, Technical Program Committee, Conference on Privacy, Security and Trust (PST), 2017, Conference Abstract
2016/11 - 2017/3	Member, Technical Program Committee, ACM Asia Conference on Computer and Communications Security (ASIACCS 2017), Conference Abstract
2016/7 - 2016/11	Chair, Publications, New Security Paradigms Workshop (NSPW 2016), Conference Abstract
2016/9 - 2016/10	Reviewer, IEEE Communications Letters, Journal
2016/7 - 2016/9	Co-Chair, Technical Program Committee, ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM 2016), Conference Abstract
2016/5 - 2016/7	Member, Technical Program Committee, ACM Conference on Computer and Communications Security (CCS 2016), Conference Abstract
2015/10 - 2016/7	Reviewer, ACM Computing Surveys, Journal
2015/1 - 2016/7	Reviewer, IEEE Transactions on Information Forensics and Security (TIFS), Journal
2015/1 - 2016/7	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal
2016/4 - 2016/6	Member, Technical Program Committee, New Security Paradigms Workshop (NSPW 2016), Conference Abstract
2015/12 - 2016/1	Reviewer, IEEE Communications Letters, Journal
2015/1 - 2015/12	Reviewer, IEEE Transactions on Emerging Topics in Computing (TETC), Journal
2015/1 - 2015/12	Reviewer, Scientific Programming, Journal
2014/1 - 2015/12	Reviewer, IEEE Transactions on Cloud Computing (TCC), Journal
2015/7 - 2015/11	Chair, Publications, New Security Paradigms Workshop (NSPW 2015), Conference Abstract
2015/6 - 2015/7	Member, Technical Program Committee, ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM 2015), Conference Abstract

2015/5 - 2015/6	Member, Technical Program Committee, Conference on Trust & Trustworthy Computing (TRUST 2015), Conference Abstract
2015/4 - 2015/6	Member, Technical Program Committee, New Security Paradigms Workshop (NSPW 2015), Conference Abstract
2013/1 - 2014/12	Reviewer, Wiley Security and Communication Networks (SCN), Journal
2012/1 - 2014/12	Reviewer, ACM Transactions on Information and System Security (TISSEC), Journal
2014/7 - 2014/9	Member, Technical Program Committee, IEEE International Conference on Parallel and Distributed Systems (ICPADS 2014), Conference Abstract
2014/6 - 2014/8	Member, Technical Program Committee, Annual Computer Security Applications Conference (ACSAC 2014), Conference Abstract
2014/3 - 2014/4	Member, Technical Program Committee, Conference on Trust & Trustworthy Computing (TRUST 2014), Conference Abstract
2012/1 - 2013/12	Reviewer, IEEE Transactions on Information Forensics and Security (TIFS), Journal
2012/1 - 2013/12	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal
2013/8 - 2013/10	Member, Technical Program Committee, IEEE International Symposium on High Assurance Systems Engineering (HASE 2014), Conference Abstract
2013/8 - 2013/9	Member, Technical Program Committee, Workshop on Anti-malware Testing Research (WATeR 2013), Conference Abstract
2013/3 - 2013/3	Member, Technical Program Committee, Conference on Trust & Trustworthy Computing (TRUST 2013), Conference Abstract
2012/3 - 2012/5	Member, Technical Program Committee, Conference on Availability, Reliability and Security (ARES 2012), Conference Abstract
2012/3 - 2012/5	Member, Technical Program Committee, Conference on Privacy, Security and Trust (PST 2012), Conference Abstract
2010/2 - 2010/4	Member, Technical Program Committee, USENIX Security Symposium 2010, Conference Abstract

Journal Review Activities

2012/1 - 2013/6	Reviewer, IEEE Transactions on Dependable and Secure Computing (TDSC) Number of Works Reviewed / Refereed: 2
2012/6 - 2013/1	Reviewer, ACM Transactions on Information and System Security (TISSEC) Number of Works Reviewed / Refereed: 2
2012/5 - 2013/1	Reviewer, IEEE Transactions on Information Forensics and Security (TIFS) Number of Works Reviewed / Refereed: 2
2010/10 - 2010/12	Reviewer, Springer World Wide Web Journal (WWWJ) Number of Works Reviewed / Refereed: 1
2009/9 - 2009/11	Reviewer, Computer Science and Information Systems (ComSIS) Journal Number of Works Reviewed / Refereed: 1
2008/2 - 2008/3	Reviewer, Journal of Information Security (IJIS) Number of Works Reviewed / Refereed: 1

Conference Review Activities

2013/3 - 2013/4	Program Committee Member, Trust & Trustworthy Computing (TRUST) 2013, Blind, Imperial College London, UK Number of Works Reviewed / Refereed: 5
2013/2 - 2013/2	Reviewer, IEEE International Symposium on Information Theory (ISIT) 2013, Blind, IEEE Number of Works Reviewed / Refereed: 1
2012/4 - 2012/5	Program Committee Member, Privacy, Security and Trust (PST) 2012, Blind, Institut Mines-Telecom Paris, France Number of Works Reviewed / Refereed: 4
2012/4 - 2012/4	Program Committee Member, Availability, Reliability and Security (ARES) 2012, Blind, University of Economics in Prague Number of Works Reviewed / Refereed: 5
2011/1 - 2011/1	External reviewer, IEEE/IFIP Dependable Systems and Networks (DSN) 2011, Blind Number of Works Reviewed / Refereed: 1
2010/2 - 2010/4	Program Committee Member, USENIX Security Symposium 2010, Blind, USENIX Association Number of Works Reviewed / Refereed: 21
2009/6 - 2009/6	External reviewer, ACM Conference on Computer and Communications Security (CCS) 2009, Blind, ACM SIGSAC Number of Works Reviewed / Refereed: 2
2009/4 - 2009/5	Reviewer, International Conference on Ubiquitous Computing (UbiComp) 2009, Blind, ACM Number of Works Reviewed / Refereed: 1
2009/3 - 2009/3	External reviewer, Symposium On Usable Privacy and Security 2009, Blind, Carnegie Mellon CyLab and Google Number of Works Reviewed / Refereed: 1
2009/3 - 2009/3	External reviewer, USENIX Security Symposium 2009, Blind, USENIX Association Number of Works Reviewed / Refereed: 2
2008/10 - 2008/10	External reviewer, ACM Symposium on Information, Computer and Communications Security (ASIACCS) 2009, Blind, ACM SIGSAC Number of Works Reviewed / Refereed: 1
2008/3 - 2008/3	External reviewer, USENIX Security Symposium 2008, Blind, USENIX Association Number of Works Reviewed / Refereed: 1
2007/6 - 2007/6	External reviewer, Annual Computer Security Applications Conference (ACSAC) 2007, Blind, Applied Computer Security Associates Number of Works Reviewed / Refereed: 4
2007/3 - 2007/4	External reviewer, Symposium On Usable Privacy and Security 2007, Blind, Carnegie Mellon CyLab Number of Works Reviewed / Refereed: 2
2007/2 - 2007/2	External reviewer, USENIX Security Symposium 2007, Blind, USENIX Association Number of Works Reviewed / Refereed: 2

Graduate Examination Activities

2013/6 - 2013/6	Master's Oral Exam Member, Weijia Su, Concordia Institute for Information Systems Engineering, Concordia University
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2013/4 - 2013/5	PhD Comprehensive Exam Committee Member, Riham Altawi, Concordia Institute for Information Systems Engineering, Concordia University
2013/1 - 2013/3	PhD External Reader, Jan-Erik Ekberg, Computer Science and Engineering, Aalto University
2013/1 - 2013/3	PhD Oral Exam Member, Khalil Al-Hussaeni, Electrical and Computer Engineering, Concordia University
2012/10 - 2012/11	PhD Oral Exam Member, Ali Mosleh, Electrical and Computer Engineering, Concordia University
2012/7 - 2012/9	PhD Oral Exam Member, Abdel Alim K. Farag, Electrical and Computer Engineering, Concordia University
2012/5 - 2012/5	Master's Oral Exam Member, Michael Schmid, Concordia Institute for Information Systems Engineering, Concordia University
2012/1 - 2012/3	PhD External Reader, Kari Kostianen, Computer Science and Engineering, Aalto University
2011/8 - 2011/8	Master's Oral Exam Member, Wasim Hussain, Electrical and Computer Engineering, Concordia University

Committee Memberships

2013/2 - 2013/5	Committee Member, Preliminary Ph.D. thesis examiner (external), Helsinki University of Technology Jan-Erik Ekberg; supervisors: Tuomas Aura, N. Asokan; Aalto University (formerly known as Helsinki University of Technology)
2012/2 - 2012/5	Committee Member, Preliminary Ph.D. thesis examiner (external), Helsinki University of Technology Kari Kostianen; supervisors: Tuomas Aura, N. Asokan; Aalto University (formerly known as Helsinki University of Technology)

Presentations

- (2021). Betrayed by the Guardian: Security and Privacy Risks of Parental Control Solutions. PrivacyCon 2021, US Federal Trade Commission, United States of America
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
- (2021). In the Name of Security: A Critical Evaluation of Online Security Products. Identity, Privacy and Security Institute (IPSI) Public Lecture, University of Toronto, Toronto, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No
- (2019). On Data Protection against Strong Adversaries. Security Seminar at Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh
Main Audience: Researcher
Invited?: Yes, Keynote?: No

4. (2018). Securing User Data and Open-source Binaries against Strong Adversaries. Security Seminar (Cyberphysical Systems group) at National Institute for Advanced Industrial Science and Technology (AIST), Tsukuba, Tsukuba, Japan
Main Audience: Researcher
Invited?: Yes, Keynote?: No
5. (2018). Password-based Authentication: from Measurements to Solutions. Mini security workshop at Waseda University, Tokyo, Japan
Main Audience: Researcher
Invited?: Yes, Keynote?: No
6. (2018). Securing User Data and Open-source Binaries against Strong Adversaries. Trusted Computing Group, Japan Chapter (TCG-JRF), Tokyo, Japan
Main Audience: Researcher
Invited?: Yes, Keynote?: No
7. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. Electrical Engineering departmental seminar at KTH Royal Institute of Technology, Stockholm, Sweden
Main Audience: Researcher
Invited?: Yes, Keynote?: No
8. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. Seminar for the Cyber-security research group at Tallinn University of Technology, Tallinn, Estonia
Main Audience: Researcher
Invited?: Yes, Keynote?: No
9. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. CS Colloquium, Friedrich-Alexander University Erlangen-Nurnberg, Erlangen, Germany
Main Audience: Researcher
Invited?: Yes, Keynote?: No
10. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. Security Seminar at the University of Innsbruck, Innsbruck, Austria
Main Audience: Researcher
Invited?: Yes, Keynote?: No
11. (2017). Securing Disk and RAM Data Against Strong Adversaries. Security Seminar (CrySP group) at the University of Waterloo, Waterloo, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No
12. (2017). Killed by Proxy: Analyzing Client-end TLS Interception Software. PrivacyCon 2017, US Federal Trade Commission, United States of America
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No
13. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. CS departmental seminar at the University of Helsinki, Helsinki, Finland
Main Audience: Researcher
Invited?: Yes, Keynote?: No
14. (2017). Breaking TLS Security Again and Again: Careless Client-end TLS Proxying. Security seminar (privacy engineering team), Google Zurich, Zurich, Switzerland
Main Audience: Researcher
Invited?: Yes, Keynote?: No
15. (2017). Securing Disk and RAM Data Against Strong Adversaries. Security Colloquium at Munich University of Applied Sciences, Munich, Germany
Main Audience: Researcher
Invited?: Yes, Keynote?: No

16. (2017). Analyses, Measurements and Solutions – A Few Example Cases in Data Security and Authentication. ZISC Lunch Seminar at ETH Zurich, Zurich, Switzerland
Main Audience: Researcher
Invited?: Yes, Keynote?: No
17. (2016). Data Security under Coercion and Physical Attacks. Lecture Series "Current Trends in IT Security", organized by the Chair for IT Security, Technical University of Munich (TU Munich), Munich, Germany
Main Audience: Researcher
Invited?: Yes, Keynote?: No
18. (2016). Data Security under Coercion and Physical Attacks. CS Forum, Aalto University, Espoo, Finland
Main Audience: Researcher
Invited?: Yes, Keynote?: No
19. (2016). Password-based Deceptive Authentication for Data Security. Security seminar at United International University, Dhaka, Bangladesh
Main Audience: Knowledge User
Invited?: Yes, Keynote?: Yes
20. (2012). Designing Systems for an Untrusted Internet. Security Seminar at North South University, Dhaka, Bangladesh
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
21. (2012). Designing Systems for an Untrusted Internet. Security Seminar at Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
22. (2011). IVApps: Trusted Computing for the Masses. MITACS Digital Security Seminar Series at Carleton University, Ottawa, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
23. (2011). ISSNet Research on Trustworthy Networks and Services. Canada-EU Future Internet Workshop, Waterloo, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
24. (2011). Unicorn: Two-Factor Attestation for Data Security. TechnoTalks at Vanier College, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No, Competitive?: No
25. (2011). Authentication and Securing Personal Information in an Untrusted Internet. Security Seminar at Concordia University, Montreal, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
26. (2010). The Usable Security of Passwords based on Digital Objects: From Design and Analysis to User Study. Seminar at University of Calgary, Calgary, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
27. (2010). The Usable Security of Passwords based on Digital Objects: From Design and Analysis to User Study. Seminar at Simon Fraser University, Vancouver, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No

28. (2010). The Usable Security of Passwords based on Digital Objects: From Design and Analysis to User Study. Seminar at University of British Columbia, Vancouver, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
29. (2010). The Usable Security of Passwords based on Digital Objects: From Design and Analysis to User Study. Seminar at University of Ontario Institute of Technology, Oshawa, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No, Competitive?: No
30. Van Oorschot PC. (2008). Security and Usability: The Gap in Real-World Online Banking. Financial Consumer Agency of Canada (FCAC), Ottawa, Canada
Main Audience: Decision Maker
Invited?: Yes, Keynote?: No, Competitive?: No

Broadcast Interviews

- | | |
|----------------------------|--|
| 2021/08/20 -
2021/08/20 | Parental control privacy analysis, The Elias Makos Show, CJAD 800 (Montreal news talk radio station) |
| 2016/05/25 -
2016/05/25 | Security software vulnerabilities, BBC Click (technological and digital news from around the world; recorded phone interview), BBC World Service, UK |
| 2016/05/07 -
2016/05/07 | Security risks due to security software, News and talk radio (live-by-phone), CBS Radio News, San Francisco, USA |
| 2014/04/16 -
2014/04/16 | Are anti-virus programs useless?, KW Magazine (live-by-phone)), CKWR FM, Kitchener, Ontario, Canada |

Text Interviews

- | | |
|------------|---|
| 2022/10/24 | Google's Incognito Mode Isn't As Private As It Sounds — Here's What You Need To Know, MTLBlog, https://www.mtlblog.com/googles-incognito-mode-isnt-as-private-as-it-sounds-heres-what-you-need-to-know |
| 2022/05/19 | Government websites and apps use the same tracking software as commercial ones: Concordia research, The Suburban: https://www.thesuburban.com/life/education/government-websites-and-apps-use-the-same-tracking-software-as-commercial-ones-concordia-research/article_c9fc748c-d781-11ec-930b-67df312a7313.html |
| 2022/05/19 | Oui, Les Gouvernements Vous Suivent, Trouve L'université Concordia, Noovo.info https://www.noovo.info/nouvelle/oui-les-gouvernements-vous-suivent.html |
| 2022/05/18 | Government Websites, Apps Use Same Tracking Software as Commercial Sites, ACM Technews: https://technews.acm.org/archives.cfm?fo=2022-05-may/may-18-2022.html |
| 2021/08/24 | Wifi public : zéro protection, OC Magazine: https://ocmagazine.org/rubriques/vie-privee/wifi-public-zero-protection |
| 2021/08/18 | Sécurité et vie privée: les applications de contrôle parental font rarement l'affaire, Le Devoir: https://www.ledevoir.com/culture/625596/recherche-et-innovation-securite-et-vie-privee-les-applications-de-controle-parental-font-rarement-l-affaire |
| 2020/12/06 | Contrôle parental, La Presse: https://www.lapresse.ca/affaires/techno/2020-12-06/clins-d-oeil-technologiques.php |
| 2020/12/02 | Many Popular Parental Control Solutions Are Insecure, ACM Technews: https://technews.acm.org/archives.cfm?fo=2020-12-dec/dec-04-2020.html |

- 2019/12/22 Most free WiFi hotspots in Montreal track your personal data, study finds, Montreal Gazette: <https://montrealgazette.com/news/local-news/most-free-wifi-hotspots-in-montreal-track-your-personal-data-study-finds>
- 2019/07/23 Un coffre-fort contre les pirates informatiques, La Presse: <https://www.lapresse.ca/actualites/2019-07-23/un-coffre-fort-contre-les-pirates-informatiques>
- 2019/07/17 Concordia professor develops prototype to thwart data theft, Montreal Gazette: <https://montrealgazette.com/news/local-news/concordia-professor-develops-prototype-to-thwart-data-theft>
- 2019/05/21 Wajam, le logiciel de publicités indésirables qui espionne des centaines de millions d'internautes, Le Figaro: <https://www.lefigaro.fr/secteur/high-tech/wajam-le-logiciel-de-publicites-indesirables-qui-espionne-des-millions-d-internautes-20190521>
- 2019/05/20 Let adware be treated as malware, Canuck boffins declare after breaking open Wajam ad injector, The Register: https://www.theregister.com/2019/05/20/wajam_malware_claims/
- 2019/03/30 Data deletion malware can be devastating but also thwarted, says Concordia professor Mohammad Mannan, The Suburban: https://www.thesuburban.com/life/education/data-deletion-malware-can-be-devastating-but-also-thwarted-says/article_c44ff64c-518a-11e9-b749-1f56f30c3b16.html
- 2018/10/08 It's 2018, and network middleware still can't handle TLS without breaking encryption, ZDNet: <https://www.zdnet.com/article/its-2018-and-network-middleware-still-cant-handle-tls-without-breaking-encryption/>
- 2018/10/08 Network Middleware Still Can't Handle TLS Without Breaking Encryption, Slashdot.org: <https://tech.slashdot.org/story/18/10/08/186222/network-middleware-still-cant-handle-tls-without-breaking-encryption>
- 2018/09/27 TLS proxies? Nah. Truthfully Less Secure 'n' poxy, say Canadian infosec researchers, The Register: https://www.theregister.com/2018/09/27/tls_proxies_still_mostly_rubbish_say_canadian_infosec_boffins/
- 2018/02/23 Facebook's mandatory malware scan is an intrusive mess, WIRED: <https://www.wired.com/story/facebook-mandatory-malware-scan/>
- 2017/10/11 Kaspersky, Russia, and the antivirus paradox, WIRED: <https://www.wired.com/story/kaspersky-russia-antivirus/>
- 2017/03/23 The clever 'DoubleAgent' attack turns antivirus into malware, WIRED: <https://www.wired.com/2017/03/clever-doubleagent-attack-turns-antivirus-malware/>
- 2017/02/06 New Security Advances Bridge the Gap Between Software and Hardware, All About Circuits: <https://www.allaboutcircuits.com/news/new-security-advances-bridge-the-gap-between-software-and-hardware/>
- 2016/11/25 Software Hypnoguard Can Protect Your Laptop, Even When it's Asleep, CNN-News18: <https://www.news18.com/news/tech/software-hypnoguard-can-protect-your-laptop-even-when-its-asleep-1315846.html>
- 2016/11/23 How to protect your laptop — even when it's asleep, Science Magazine: <https://scienmag.com/how-to-protect-your-laptop-even-when-its-asleep/>
- 2016/07/13 Hoogleraar hekelt nut van anti-virussoftware, Security.nl: <https://www.security.nl/posting/477790/Hoogleraar+hekelt+nut+van+anti-virussoftware>
- 2016/07/12 Antivirüsler gerçekten koruyor mu?, Hurriyet (Turkey): <http://www.hurriyet.com.tr/antivirusler-gercekten-koruyor-mu-40141589>

- 2016/07/11 U.S. security agency warns against 'useless' antivirus programs, Digital Journal: <http://www.digitaljournal.com/technology/usa-security-agency-warns-against-useless-antivirus-programs/article/469596>
- 2016/07/08 Antivirus software is 'increasingly useless' and may make your computer less safe, CBC News Technology & Science: <http://www.cbc.ca/news/technology/antivirus-software-1.3668746>
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Refereed?: Yes, Invited?: No
Number of Contributors: 2

55. Mannan M, Van Oorschot PC et al. (2007). Security and Usability: The Gap in Real-World Online Banking. New Security Paradigms Workshop (NSPW) 2007, United States of America (1-14). ACM, Conference Date: 2007/9
Paper
First Listed Author
Published
Refereed?: Yes, Invited?: No
Number of Contributors: 2
56. Mannan M, van Oorschot PC et al. (2007). Using a Personal Device to Strengthen Password Authentication from an Untrusted Computer. Financial Cryptography and Data Security (FC) 2007, Scarborough, Trinidad and Tobago (88-103). Springer, Conference Date: 2007/2
Paper
First Listed Author
Published
Refereed?: Yes, Invited?: No
Number of Contributors: 2
57. Mannan M, van Oorschot PC et al. (2006). A Protocol for Secure Public Instant Messaging. Financial Cryptography and Data Security (FC) 2006, Anguilla (20-35). Springer, Conference Date: 2006/2
Paper
First Listed Author
Published
Refereed?: Yes, Invited?: No
Number of Contributors: 2
58. Mannan M, van Oorschot PC et al. (2005). On Instant Messaging Worms, Analysis and Countermeasures. Workshop on Rapid Malcode (WORM) 2005, Fairfax, United States of America (2-11). ACM, Conference Date: 2005/11
Paper
First Listed Author
Published
Refereed?: Yes, Invited?: No
Number of Contributors: 2
59. Mannan M, van Oorschot PC et al. (2004). Secure Public Instant Messaging: A Survey. Conference on Privacy, Security and Trust (PST) 2004, Fredericton, Canada (69-77), Conference Date: 2004/10
Paper
First Listed Author
Published
Refereed?: Yes, Invited?: No
Number of Contributors: 2

Intellectual Property

Patents

1. Protection System and Method against Unauthorized Data Alteration. United States of America. US10977381B2.
Patent Status: Granted/Issued
Year Issued: 2021
Inventors: Mannan, M; *Zhao, L
This state-of-the-art anti-ransomware protection system is based on our NDSS 2019 paper. It provides data security against ransomware with the highest software privileges, including root/admin. It also protects data against deletion attacks.
2. Password Triggered Trusted Encryption Key Deletion. United States of America. US20170230179A1.
Patent Status: Granted/Issued
Year Issued: 2019
Inventors: Mannan, M; *Zhao, L
Our "Trusted Deletion" system enables (based on Gracewipe, published at NDSS 2015): triggering the hidden encryption key deletion process in a way that is indistinguishable from unlocking the hidden data; verification of the deletion process; restricting guessing of passwords used for data confidentiality; and full-memory encryption. Applications include: quick "erase" of hard disks, triggering deletion in lost/stolen laptops, cold-boot protection, erase hard disk under coercion.



Protected when completed

Date Submitted: 2024-03-08 09:53:35

Confirmation Number: 1757461

Template: NSERC_Researcher

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Correspondence language: English

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Work	arashmoh@encs.concordia.ca



Protected when completed

Dr. Arash Mohammadi

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
Persian	Yes	Yes	Yes	Yes	Yes

Degrees

- 2015/11 Post-doctorate, Signal Processing, University of Toronto
Supervisors: Konstantinos N. Plataniotis, 2013/12 - 2015/12
- 2013/11 Doctorate, Electrical Engineering and Computer Science, York University
Supervisors: Amir Asif, 2008/9 - 2013/11
- 2007/10 Master's Thesis, Biomedical Engineering, Amirkabir University of Technology
Supervisors: Almasganj, Farshad, 2005/9 - 2007/10
- 2005/8 Bachelor's, Electrical Engineering, University of Tehran

Recognitions

- 2022/6 Concordia University Research Award of Excellence - 5,000
Concordia University
Prize / Award
Concordia University Research Fellow for the Award in Category B – for researchers who are working towards facilitating and building upon their track record of research excellence, leadership, productivity and influence.
- 2022/2 GCS Research Chair - Tier II - 5,000
Concordia University
Prize / Award
Received Gina Cody School of Engineering (GCS) Dean's Excellence Research Award
- 2021/9 2021 IEEE 5-Minute Video Clip Context - 1,500
IEEE International Conference on Image Processing (ICIP)
Prize / Award
Third Prize at 2021 IEEE International Conference on Image Processing (ICIP) for our video entitled “Deep Learning for COVID-19 Diagnosis A to Z”
- 2020/6 Best Academic Paper Award
EEE International Conference on Prognostics and Health Management
Prize / Award
Best academic Paper Award, 2020 IEEE International Conference on Prognostics and Health Management.

- 2019/6 GCS Research Chair - Tier III - 5,000
Concordia University
Prize / Award
Concordia University, Gina Cody School of Engineering and Computer Science's Research Excellence Award, (GCS Research Chair - Tier III)
- 2019/6 GCS Teaching Excellence Award
Concordia University
Prize / Award
Concordia University, Gina Cody School of Engineering and Computer Science's Teaching Excellence Award in the New Teacher Category
- 2018/7 Concordia President's Excellence in Teaching Award - 2,000
Concordia University
Prize / Award
Concordia President's Excellence in Teaching Award in the New Teacher Category

User Profile

Research Specialization Keywords: Biomedical Signal Processing, Distributed Signal Processing, Human Machine Interfacing (HMI), Information Fusion, Internet of Things (IoT), Machine Learning (ML)/Artificial intelligence (AI), Medical Image Radiomics, Signal Processing over Networks, Statistical Signal processing, Tracking and Localization

Employment

- 2020/6 Associate Professor
Concordia Institute for Information System Engineering (CIISE), Concordia University
Full-time, Assistant Professor
Tenure Status: Tenure
- 2015/12 - 2020/6 Assistant Professor
Concordia Institute of Information System Engineering, Engineering, Concordia University
Full-time, Term, Assistant Professor
Tenure Status: Tenure Track
- 2013/12 - 2015/12 Post-doctoral Fellow
Electrical and Computer Engineering, University of Toronto
Full-time
Tenure Status: Non Tenure Track
Performing research on complex-valued dynamical systems; Designing centralized and distributed complex-valued estimation algorithms; Developing complex-valued clustering and mixture reduction algorithms.
- 2009/1 - 2013/11 Teaching Assistant
Computer Science, York University
Part-time
Tenure Status: Non Tenure Track
Tutorial Teaching Assistant (TTA) for the following courses: (i) Mobile communication (CSE-4215), 3 semesters; (ii) Signals and Systems (CSE3451), 3 semesters. Teaching Assistant for the following courses: (i) Introduction to Computer Science I (CSE1020), 3 semesters; (ii) Introduction to Computer Science II (CSE1030); (iii) Introduction to Computing for Mathematics and Statistics (CSE1560), and; (iv) Computer Use: Fundamentals (CSE1520), 2 semesters.

- 2008/9 - 2013/11
 Research Assistant
 Electrical Engineering and Computer Science, York University
 Full-time
 Tenure Status: Non Tenure Track
 Performing research on distributed signal processing algorithms for systems with non-linear dynamics.
- 2012/9 - 2012/12
 Sessional Instructor
 Electrical Engineering and Computer Science, Engineering, York University
 Full-time, Sessional, Lecturer
 Tenure Status: Non Tenure Track
 Organize lectures, teaching, mark assignments, managing and organizing laboratory classes.
- 2007/10 - 2008/9
 Research Associate
 Speech Processing, Research Center of Intelligent Signal Processing
 Development of Persian speech recognition engine/decoder. Design and performance improvement of a real time automatic Persian speech to text system

Research Funding History

Awarded [n=5]

- 2023/5 - 2028/4
 Principal Applicant
 NSERC Discovery Grant, Grant
Funding Sources:
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 Total Funding - 210,000
 Portion of Funding Received - 100
 Funding Competitive?: Yes
- 2022/8 - 2023/7
 Principal Applicant
 Mitacs cluster (6 Accelerates): "Advance Machine Learning for Medical Survival Analysis", Grant
Funding Sources:
 Mathematics of Information Technology and Complex Systems (MITACS)
 Cluster
 Total Funding - 90,000
 Portion of Funding Received - 60,000
 Funding Competitive?: Yes
- 2021/4 - 2023/4
 Principal Applicant
 Mitacs Cluster (9 Accelerates): "Advanced Signal Processing and Machine Learning for Autonomous Screening in Unconstrained Environments", Grant
Funding Sources:
 Mitacs
 Cluster
 Total Funding - 120,000
 Portion of Funding Received - 120,000
 Funding Competitive?: Yes
- 2019/11 - 2023/4
 Co-applicant
 Micro-Nets: Innovation for Defence Excellence and Security (IDEaS), Grant
Funding Sources:
 Government of Canada
 Micro-Nets: Innovation for Defence Excellence and Security (IDEaS)
 Total Funding - 1,762,116
 Portion of Funding Received - 169,500
 Funding Competitive?: Yes

Co-applicant : Fakhri Karray; Henry Leung; Konstantinos N. Plataniotis; Marina Gavrilova; Mark Coates; Yaoping Hu; Yingxu Wang;

Principal Applicant : Svetlana Yanushkevich

2021/9 - 2022/12
Co-applicant

Canda Foundation for Innovation (CFI): "Toward Intelligent and Resilient Smart Cities with Energy-Vehicle-Human Interactions", Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

CFI

Total Funding - 1,800,000

Portion of Funding Received - 415,502

Funding Competitive?: Yes

Co-applicant : Jun Yan; Walter Lucia;

Principal Applicant : Chadi Assi

Completed [n=11]

2016/4 - 2023/4
Principal Applicant

NSERC Discovery Grant, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery Grant

Total Funding - 217,000

Portion of Funding Received - 217,000

Funding Competitive?: Yes

2022/3 - 2022/7
Principal Applicant

Mitacs Accelerates International (2 Accelerates): "Advanced Signal Processing for Directional BLE-based Indoor Localization", Grant

Funding Sources:

Mitacs

Total Funding - 30,000

Portion of Funding Received - 30,000

Funding Competitive?: Yes

2021/2 - 2022/1
Principal Applicant

Horizon Postdoctoral Fellowship, Grant

Funding Sources:

Concordia University

Horizon Postdoctoral Fellowship

Total Funding - 76,000

Portion of Funding Received - 38,000

Funding Competitive?: Yes

Co-applicant : Konstantinos N. Plataniotis

2019/5 - 2021/4
Principal Applicant

Mitacs Cluster (9 Accelerates): "Advanced Signal Processing and Machine Learning for BLE-based Indoor Localization", Grant

Funding Sources:

Mitacs

Mitacs Cluster (9 Accelerates)

Total Funding - 120,000

Portion of Funding Received - 93,333

Funding Competitive?: Yes

Co-applicant : Konstantinos N. Plataniotis

2017/9 - 2019/9

FRQNT New University Researchers Start up Program, Grant

Principal Applicant **Funding Sources:**
Fonds de recherche du Québec - Nature et technologies (FRQNT)
FRQNT
Total Funding - 89,730
Portion of Funding Received - 89,730
Funding Competitive?: Yes

2019/2 - 2019/7
Principal Investigator **Funding Sources:**
NSERC-ENGAGE, Grant
Natural Sciences and Engineering Research Council of Canada (NSERC)
NSERC-Engage
Total Funding - 25,000
Portion of Funding Received - 25,000
Funding Competitive?: Yes

2018/5 - 2019/5
Principal Applicant **Funding Sources:**
Concordia University
Capital Research Innovation Funds
Total Funding - 100,000
Portion of Funding Received - 99,989
Funding Competitive?: Yes
Co-applicant : Amr Youssef; Chadi Assi; Habib Benali; Jun Yan; Lingyu Wang; Luis Rodrigues; Walter Lucia

2018/4 - 2019/4
Principal Applicant **Funding Sources:**
Concordia University
Aid to Research-Related Events Grant (ARRE)
Total Funding - 7,500
Portion of Funding Received - 7,500
Funding Competitive?: Yes

2016/8 - 2017/11
Principal Investigator **Funding Sources:**
NSERC GRF: Signal Processing Through Graphs, Grant
Natural Sciences and Engineering Research Council of Canada (NSERC)
Total Funding - 4,247
Portion of Funding Received - 4,247
Funding Competitive?: Yes

2017/4 - 2017/10
Principal Applicant **Funding Sources:**
NSERC ENGAGE, Grant
Natural Sciences and Engineering Research Council of Canada (NSERC)
ENGAGE
Total Funding - 25,000
Portion of Funding Received - 25,000
Funding Competitive?: Yes

2016/10 - 2017/10
Principal Applicant **Funding Sources:**
Concordia University
Aid to Research-Related Events Grant (ARRE), Grant
Total Funding - 7,500
Portion of Funding Received - 7,500
Funding Competitive?: Yes

Under Review [n=1]

2023/5 - 2028/4
Co-applicant

Enhancing the Resilience and Security of the Smart Grid, Grant

Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Alliance
Total Funding - 2,406,522
Portion of Funding Received - 0
Funding Competitive?: Yes

Co-applicant : Amr M.Youssef; Chadi Assi; Jun Yan; Lingyu Wang; Mohsen Ghafouri;
Principal Applicant : Mourad Debbabi

Student/Postdoctoral Supervision**Bachelor's [n=18]**

2022/10 - 2023/9
Principal Supervisor

Corinne Beaudoin-Pellerin (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/10 - 2023/9
Principal Supervisor

Karl Schroeder (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/10 - 2023/9
Principal Supervisor

Timothee Duthoit (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/10 - 2023/9
Principal Supervisor

Anonna Chowdhury (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/10 - 2023/9
Principal Supervisor

Khaled Matloub (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/10 - 2023/9
Principal Supervisor

Mathias Ho (Completed) , Concordia University
Thesis/Project Title: Automatic Pill Dispenser
Present Position: Student

2022/5 - 2022/8
Principal Supervisor

Kshitiz Bansal (Completed) , Concordia University
Thesis/Project Title: Man Machine Interfacing via sEMG Signals
Present Position: Mitacs GlobaLink

2022/5 - 2022/8
Principal Supervisor

HaoTian Hong (Completed) , Concordia University
Thesis/Project Title: Man-Machine Interfacing via sEMG Signals coupled with AR/VR
Present Position: Mitacs GlobaLink

2022/5 - 2022/8
Principal Supervisor

Anuj Attri (Completed) , Concordia University
Thesis/Project Title: AR/VR for Man-Machine Interfacing
Present Position: Mitacs GlobaLink

2020/5 - 2020/8
Principal Supervisor

Yaling Wu (Completed) , Concordia University
Thesis/Project Title: Lung Cancer Radiomics: Deep Learning-based Automatic Tumor Annotation
Present Position: Student

2020/5 - 2021/9 Principal Supervisor	Marian Maksimos (Completed) , Concordia University Thesis/Project Title: Multiple Model Reinforcement Learning for Autonomous Systems Present Position: Student
2019/5 - 2019/12 Principal Supervisor	Laura Isabel Grueso (Completed) , Concordia University Thesis/Project Title: Assistive Technologies: Design of Motion Graphics for Brain Computer Interfacing Present Position: Industry
2018/5 - 2018/9 Principal Supervisor	Jesse Steven Abeke (Completed) , Concordia University Thesis/Project Title: Secure State Estimation in Smart Grids via Phasor Measurement Units Present Position: Student
2018/5 - 2018/9 Principal Supervisor	William Cui (Completed) , Concordia University Thesis/Project Title: Control of a Mobile Robot Using an Advanced EEG Headset for Brain Computer Interfacing Present Position: NSERC USRA Student
2018/5 - 2018/9 Principal Supervisor	Suzette Slim (Completed) , Concordia University Thesis/Project Title: Segmentation of Lung Cancer Tumors Present Position: TRAC Student
2017/5 - 2017/9 Principal Supervisor	Desiree Blizzard (Completed) , Concordia University Thesis/Project Title: Event-based Object Tracking for Intrusion Detection Present Position: NSERC USRA Student
2017/5 - 2017/9 Principal Supervisor	Tim Maloney (Completed) , Concordia University Thesis/Project Title: Online EEG-based Brain Computer Interface for Robotic Control Present Position: NSRC USRA Student
2017/5 - 2017/8 Co-Supervisor	Mohammad Nour Ghalayini (Completed) , Concordia University Thesis/Project Title: Cooperative Unmanned Aerial Vehicles Cyber-Physical Testbed Present Position: Student, Concordia University

Master's non-Thesis [n=1]

2017/9 - 2017/12 Principal Supervisor	Kabir Ahmed (Completed) , Concordia University Thesis/Project Title: Degradation Modelling/Analysis and Implementation based on NASA data Present Position: Student, Concordia University
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Master's Thesis [n=12]

2023/1 - 2024/12 Principal Supervisor	Mary Acquah (In Progress) , Concordia University Thesis/Project Title: Secure Distributed Estimation/Learning based on Block-Chain Technologies Present Position: Student
2022/9 - 2024/8 Principal Supervisor	June Sung Moon (In Progress) , Concordia University Thesis/Project Title: Brain Computer Interfacing via Augmented Reality Present Position: Student
2021/9 - 2023/8 Co-Supervisor	Mansooreh Montazerin (Completed) , Concordia University Thesis/Project Title: Gesture Recognition via High-density sEMg Signals Present Position: Student
2021/1 - 2022/12 Principal Supervisor	Bahar Karimi (Completed) , Concordia University Thesis/Project Title: Autonomous Cognitive Assessment Avatar Present Position: Student

- 2020/1 - 2021/12
Principal Supervisor
Shahin Heidarian (Completed) , Concordia University
Thesis/Project Title: Capsule Network-based COVID-19 Diagnosis and Transformer-based Lung Cancer Invasiveness Prediction via Computerized Tomography (CT) Images
Present Position: Machine Learning Scientist, Synthesis Health Intelligence Inc.
- 2019/9 - 2021/8
Co-Supervisor
Farnoush Ronaghi (Completed) , Concordia University
Thesis/Project Title: Deep Learning-based Information Fusion Frameworks for Stock Price Movement Prediction
Present Position: Data Analyst, Rakuten Kobo Inc.
- 2019/1 - 2020/12
Principal Supervisor
Mohammadamin Atashi (Completed) , Concordia University
Thesis/Project Title: Multiple Model-based Indoor Localization via Bluetooth Low Energy and Inertial Measurement Unit Sensors
Present Position: Senior Data Scientist, The Globe and Mail
- 2019/1 - 2020/12
Principal Supervisor
Raika Karimi (Completed) , Concordia University
Thesis/Project Title: Low Fatigue Designs and Deep Learning-based Classification for Motion Visual Evoked Potentials
Present Position: Machine Learning Research Engineer, Huawei
- 2018/9 - 2020/8
Principal Supervisor
Parvin Malekzadeh (Completed) , Concordia University
Thesis/Project Title: Multiple Model Bayesian Estimation for BLE-based Localization and RL-based Decision Support of Autonomous Agents
Present Position: PhD Candidate, University of Toronto
- 2018/1 - 2019/12
Co-Supervisor
Mahsa Mirgholami (Completed) , Concordia University
Thesis/Project Title: EEG-based Brain-Computer Interfaces Using Motor-Imagery Experiments
Present Position: Data Engineer, Merkle Canada
- 2016/9 - 2018/7
Principal Supervisor
Somaieh Davar (Completed) , Concordia University
Thesis/Project Title: Ternary and Hybrid Event-based Particle Filtering for Distributed State Estimation in Cyber-Physical Systems
Present Position: Surgical Innovation Fellow, McGill University
- 2016/9 - 2018/6
Principal Supervisor
Golnar Kalantar (Completed) , Concordia University
Thesis/Project Title: Advanced Signal Processing Solutions for Brain-Computer Interfaces: From Theory to Practice
Present Position: Data Scientist, Octave Group
- Doctorate [n=11]**
- 2019/9 - 2023/5
Principal Supervisor
Zohreh Hajiakhondi (In Progress) , Concordia University
Thesis/Project Title: Caching in Wireless Sensor Networks
Present Position: PhD Candidate
- 2019/5 - 2022/10
Principal Supervisor
Mohammad Salimibeni (In Progress) , Concordia University
Thesis/Project Title: Implementation of Location-based Services based on BLE Beacons
Present Position: PhD Candidate
- 2019/4 - 2023/5
Co-Supervisor
Afshin Ebita (In Progress) , Concordia University
Thesis/Project Title: Wide Area Monitoring in Smart Grids
Present Position: PhD Candidate
- 2018/9 - 2022/9
Co-Supervisor
Abolfazl Rahiminejad (In Progress) , Concordia University
Thesis/Project Title: Micro-Grid Management Systems
Present Position: PhD Candidate

2018/9 - 2023/5 Co-Supervisor	Saghar Vahidi (In Progress) , Concordia University Thesis/Project Title: Wide Area Monitoring Systems in Smart Grid Present Position: PhD Candidate
2018/6 - 2022/9 Principal Supervisor	Elaheh Rahimian (In Progress) , Concordia University Thesis/Project Title: Advanced Bio-Signal Processing for Wearable Technologies Present Position: PhD Candidate
2018/6 - 2022/9 Co-Supervisor	Soheil Zabihi (In Progress) , Concordia University Thesis/Project Title: Deep Learning for Visual Tracking Present Position: PhD Candidate
2017/9 - 2021/8 Principal Supervisor	Parnian Afshar (Completed) , Concordia University Thesis/Project Title: Capsule Network-based Radiomics: From Diagnosis to Treatment Present Position: Data Scientist II, Amazon
2016/9 - 2020/12 Principal Supervisor	Soroosh Shahtalebi (Completed) , Concordia University Thesis/Project Title: Towards effective application of data-driven learning models for assistive technologies and brain-computer interfaces. Present Position: Postdoctoral Research Fellow, Vector Institute
2016/5 - 2020/12 Co-Supervisor	Ali Al-Dulaimi (Completed) , Concordia University Thesis/Project Title: Degradation Modeling and Remaining Useful Life Estimation: From Statistical Signal Processing to Deep Learning Models. Present Position: Assistant Professor, University of Missouri
2016/1 - 2020/12 Co-Supervisor	Amir Amini (Completed) , Concordia University Thesis/Project Title: Event-triggered Consensus Frameworks for Multi-agent Systems Present Position: Engineer - MTS, MDA Ltd.

Post-doctorate [n=4]

2021/2 - 2022/1 Co-Supervisor	Amir Amini (Completed) , Concordia University Thesis/Project Title: Secure Localization via Smart Beacons in Internet of Things (IoT) Present Position: Engineer - MTS, MDA Ltd.
2021/1 - 2021/11 Co-Supervisor	Ali Al-Dulaimi (Completed) , Concordia University Thesis/Project Title: Prognostic Health Management Present Position: Assistant Professor, University of Missouri
2019/9 - 2020/1 Co-Supervisor	Farzad Amirjavid (Completed) , Concordia University Thesis/Project Title: Signal Processing and Machine Learning for BLE-based Indoor Localization Present Position: Data Scientist
2016/8 - 2017/10 Co-Supervisor	Hamidreza Sadreazami (Completed) , Concordia University Thesis/Project Title: Graph-based Signal Processing Present Position: Senior Data Scientist, Groupe Dynamite

Event Administration

2023/6 - 2024/7	Organizing Committee Member, Program Chair, IEEE International Conference on Human-Machine Systems (IEEE ICGMS), Conference, 2024/5 - 2024/5
2022/9 - 2023/7	Organizing Committee Member, Tutorials Co-Chair, 2023 IEEE Intelligent Vehicles (IV), Conference, 2023/6 - 2023/6

2022/5 - 2022/11	Sole Special Session Organizer, Signal Processing for Physiological Signals, as part of IEEE Asilomar Conference on Signals, Systems, and Computers, Conference, 2022/11 - 2022/11
2019/8 - 2021/12	Organizing Committee Member, General Co-Chair, IEEE International Conference on Autonomous Systems (ICAS), Conference, 2021/8 - 2021/8
2020/4 - 2021/10	Organizing Committee Member, Special Session Co-Chair, IEEE International Conference on Image Processing (ICIP), Conference, 2021/9 - 2021/9
2020/4 - 2021/6	Organizing Committee Member, Challenge Co-Chair, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Conference, 2021/6 - 2021/6
2020/5 - 2020/11	Sole Special Session Organizer, Statistical Signal Processing Over Networks, as part of IEEE Asilomar Conference on Signals, Systems, and Computers, Conference, 2020/11 - 2020/11
2020/5 - 2020/11	Sole Special Session Organizer, Neuro-Rehabilitation and Assistive Technologies, as part of IEEE Asilomar Conference on Signals, Systems, and Computers, Conference, 2020/11 - 2020/11
2020/4 - 2020/10	Lead Special Session Organizer, Explainable Machine Learning for Image Processing Special Session, as part of 2020 IEEE International Conference on Image Processing (ICIP), Conference, 2020/10 - 2020/10
2019/4 - 2019/11	General Co-Chair, Symposium on Advanced Bio-Signal Processing & Machine Learning for Assistive and Neuro-Rehabilitation Systems, Conference, 2019/11 - 2019/11
2019/4 - 2019/10	Lead Special Session Organizer, Explainable Machine Learning for Image Processing Special Session as part of 2019 IEEE International Conference on Image Processing (ICIP), Conference, 2019/10 - 2019/10
2019/1 - 2019/6	Organization & Technical Committee Member, Autonomy and Intelligence in Robotic Rehabilitation and Assistive Technologies as as part of 2019 RehabWeek, Workshop, 2019/6 - 2019/6
2018/1 - 2018/10	General Co-Chair, Symposium on Advanced Bio-Signal Processing and Machine Learning for Medical Cyber-Physical Systems, Conference, 2018/10 - 2018/10
2018/4 - 2018/9	Lead Organizer, 2018 IEEE Video and Image Processing (VIP) Cup, Conference, 2018/12 - 2018/12
2017/1 - 2017/11	General Co-Chair, Symposium on Advanced Bio-Signal Processing for Rehabilitation & Assistive Systems, Conference, 2017/11 - 2017/11
2017/2 - 2017/10	Lead Special Session Organizer, Bio-Signal Processing for Movement Assessment, Neuro-Rehabilitation & Assistive Technologies, Conference, 2017/10 - 2017/10

Editorial Activities

2022/9 - 2025/8	Associate Editor (AE), International Journal of Digital Human, Journal
2021/11 - 2024/12	Associate Editor (AE), Nature Scientific Reports, Journal
2020/1 - 2023/12	Associate Editor (AE), IEEE Signal Processing Letters, Journal
2019/9 - 2021/4	Guest Editor (GE), IEEE Signal Processing Magazine (SPM), Special Issue entitled "Signal Processing for Neurorehabilitation and Assistive Technologies", Journal
2017/1 - 2020/7	Associate Editor (AE), IET Signal Processing, Journal
2016/12 - 2018/3	Lead Guest Editor (LGE), IEEE Transactions on Signal and Information Processing over Networks, Journal

International Collaboration Activities

2022/1 - 2024/12	Research Collaborator, Australia Research collaboration with Prof. Hamid Alinejad Rokny from University of New South Wales, (UNSW Sydney), Sydney, Australia on Graph-Learning techniques to analyze electronic health records.
2021/7 - 2023/12	Research Collaborator, United States of America Research collaboration with Prof. E. Mark Haacke from Wayne State University, Detroit, Michigan, USA, on development of signal processing and machine learning solutions for diagnosis based on MRI images.
2021/6 - 2023/12	Research Collaborator, United States of America Research collaboration with Prof. Reza Taleei from Thomas Jefferson University Hospitals, Philadelphia, PA United States, on development of prognostic signal processing and machine learning models.
2019/9 - 2023/12	Research Collaborator, United Kingdom Research collaboration with Prof. Dario Farina from Imperial Collage London, Imperial College London, London, United Kingdom, on development of signal processing and machine learning solutions to advance human machine interfacing.
2019/1 - 2022/12	Research Collaborator, United States of America Research collaboration with Prof. S. Farokh Atashzar from New York University (NYU), New York, NY, United States, on development of signal processing and machine learning models for Rehabilitation and Assistive Systems.
2017/6 - 2022/7	Research Collaborator, United States of America Research collaboration with Prof. Mohseni from Case Western Reserve University, Cleveland, OH, USA on development of advance processing solutions for cuff-less blood pressure estimation based on a new device developed in the BioMicroSystems Lab.
2018/6 - 2021/12	Research Collaborator, United States of America Research collaboration with Dr. Keyvan Farahani from National Cancer Institute (NCI), USA, on development of signal processing and machine learning solutions for Medical Image Radiomics.
2019/5 - 2020/12	Research Collaborator, United States of America Research collaboration with Dr. Ehsan Saeidpour and Prof. Kenneth Loparo from Case Western Reserve University, Cleveland, OH, United States, on application of signal processing techniques for load demand response forecasting in Smart Grids.

Committee Memberships

2022/1	Chair, Academic Committee Chair, Canadian Medical and Biological Engineering Society (CMBES)
2018/9	Committee Member, IEEE System, Man, and Cybernetics (SMC) Technical committee on "Brain-Inspired Cognitive Systems", IEEE
2016/8	Co-chair, Montreal Chapter, IEEE Signal Processing Society (SPS)
2022/9 - 2024/8	Committee Member, Steering Committee of EEE Autonomous Systems Initiative (ASI), IEEE Signal Processing Society (SPS)
2019/1 - 2021/12	Committee Member, IEEE Signal Processing Society (SPS) Student Services Committee, IEEE

2018/1 - 2021/12	Committee Member, Membership Board of IEEE Signal processing Society (SPS), Institute of Electrical and Electronics Engineers (IEEE) Voting member of IEEE Signal processing Society (SPS) Membership Board
2018/1 - 2021/12	Chair, (Director) Membership Services Developments of IEEE Signal Processing Society (SPS), Institute of Electrical and Electronics Engineers (IEEE) Elected as the Director Membership Services of IEEE Signal Processing Society (SPS) and chair of the associated committee.
2018/1 - 2021/12	Committee Member, Publication Board of Signal processing Society (SPS), Institute of Electrical and Electronics Engineers (IEEE) Member (non-voting) of IEEE Signal processing Society (SPS) Publication Board
2018/1 - 2021/12	Committee Member, Conference Board of IEEE Signal Processing Society (SPS), Institute of Electrical and Electronics Engineers (IEEE) Voting member of IEEE Signal Processing (SPS) Conference Board.

Other Memberships

2022/6 - 2023/12	Committee Member, Concordia University Gina Cody School (GCS), Funding Adjudication Committee
2022/4 - 2023/12	Committee Member, Concordia University Gina Cody School (GCS), Faculty Optimization Program (FOP) Committee
2022/2 - 2023/12	Committee Member, Concordia University Gina Cody School (GCS), Research Grant Committee
2021/4 - 2022/12	Committee Member, Concordia University Concordia University Human Research Ethics Committee (UHREC)
2021/1 - 2022/12	Committee Member, Concordia University Concordia University, SGS Graduate Awards/Prizes Adjudication Committees
2021/1 - 2022/12	Committee Member, Concordia University President's Excellence in Teaching Award (PETA) Committee
2017/8 - 2019/8	Committee Member, Concordia University ENCS Faculty Health and Safety Committee
2017/3 - 2019/3	Committee Member, Concordia University ENCS Faculty Council

Presentations

- (2022). Biological Signal Processing and Machine Learning: From Brain Computer Interfaces (BCI) to Cancer/COVID-19 Radiomics. Seminar Series of University of New South Wales (UNSW Sydney), Graduate School of Biomedical Engineering, Australia
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
- (2022). Signal Processing (SP) and Machine Learning (ML) for Brain Computer Interfacing (BCI) & Brain MRI Analysis. PERFORM/BIC Research Retreat, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: No

3. (2021). On Future Development of Autonomous Systems. Plenary Panel at IEEE International Conference on Autonomous Systems (ICAS), Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
4. (2021). Deep Learning for Diagnosis/Prognosis of COVID-19 Chest Images. engAGE / PERFORM Research Retreat, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
5. (2020). IEEE Signal Processing Society (SPS) Membership Preview. IEEE Signal Processing Society (SPS), Canada
Main Audience: General Public
Invited?: Yes, Keynote?: Yes
6. (2020). Advanced Biological Signal Processing and Machine Learning Systems. Canadian Society of Iranian Engineers & Architects, Toronto, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: Yes
7. (2019). Distributed, Event-based, and Secure Multi-Agent Autonomous Systems. IEEE SPS AutoDefense Winter School on Autonomous Systems, Ottawa, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
8. (2018). Advanced Signal Processing & Machine Learning for Hybrid Brain Computer Interfacing and Pathological Tremor Extraction. Toronto Rehabilitation Institute Seminar Series, Canada
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes

Publications

Journal Articles

1. S. Afshar, M. Roshanzamir, H. Asgharnezhad, A. Mohammadi, H. Alinejad-Rokny. (2023). A Novel Uncertainty-aware Skin Cancer Diagnosis based on Deep Learning. *Neural Computing and Applications*. 35: 22179–2218.
Published
Refereed?: Yes, Open Access?: No
2. S. Zabihi*, E. Rahimian*, A. Asif, A. Mohammadi. (2023). TraHGR: Transformer for Hand Gesture Recognition via ElectroMyography. *IEEE Transactions on Neural Systems & Rehabilitation Engineering*. 31: 4211-4224.
Published
Refereed?: Yes, Open Access?: Yes
3. G. Kianfar, M. Azadi, J. Abouei, A. Mohammadi, K.N. Plataniotis. (2023). Wireless Body Area NanoNetworks via Vascular Molecular Communication. *IEEE Transactions on NanoBioscience*.
Revision Requested
Refereed?: Yes, Open Access?: No
4. X. Liu, F. Deng, W. Wei, X. Zhao, A. Mohammadi. (2023). Consensus Tracking of Networked Stochastic Multi-Agent Systems with Adaptive Fault-Tolerant Control under Markovian Switching. *IEEE Transactions on Control of Network Systems*.
Submitted
Refereed?: Yes, Open Access?: No

5. N. Enshaei, F. Naderkhani, F. Berger, S. Mubareka, V. Campos, K. Narang, V. Thayalasuthan, A. Mohammadi, A. Oikonomou. (2023). Differentiation of COVID-19 from non-COVID Seasonal Viral Infections on Baseline Chest Radiographs: Comparison of a Deep Learning Model with Multireader Evaluation. *Radiology*.
Submitted
Refereed?: Yes, Open Access?: No
6. X. Liu, F. Deng, W. Wei, X. Zhao, A. Mohammadi. (2023). Fault-tolerant Tracking Control of Networked Stochastic Heterogeneous Multi-Agent Systems with Communication Time-Delay. *IEEE Transactions on Circuits and Systems II: Express Briefs*.
Submitted
Refereed?: Yes, Open Access?: No
7. S. Vahidi*, A. Amini, M. Ghafouri, M. Au, A. Mohammadi, and M. Debbabi. (2023). Resilient Periodic Observer-based Event-Triggered Wide-Area Controller For Oscillation Damping Against Time Synchronization Attacks in WAMPAC Systems. *IEEE Transactions on Industrial Informatics*.
Revision Requested
Refereed?: Yes, Open Access?: No
8. Z. HajiAkhondi*, A. Mohammadi, J. Abouei, and K.N. Plataniotis,. (2023). CLSA: Contrastive Learning-based Survival Analysis for Popularity Prediction in MEC Networks. *IEEE Internet of Things (IoT) Journal*.
Accepted
Refereed?: Yes, Open Access?: No
9. A. Rahiminezhad*, M. Ghafouri, R. Atallah, W. Lucia, M. Debbabi, and A. Mohammadi. (2023). Resilience Enhancement of Islanded Microgrid by Diversification, Reconfiguration, and DER Placement/Sizing. *International Journal of Electrical Power & Energy Systems*. 147
Published
Refereed?: Yes, Open Access?: No
10. M. Montazerin*, E. Rahimian*, F. Naderkhani, S. Farokh Atashzar, S. Yanushkevich, A. Mohammadi. (2023). Hand Gesture Recognition with High-Density Electromyogram Signals via Transformer Architecture. *Nature Scientific Reports*. 13
Published
Refereed?: Yes, Open Access?: Yes
11. A. Ebita*, M. Ghafouri, M. Debbabi, A. Mohammadi. (2023). Spatial-Temporal Data-Driven Model for Load Altering Attack Detection in Smart Power Distribution Networks. *IEEE Transactions on Industrial Informatics*.
Revision Requested
Refereed?: Yes, Open Access?: No
12. S. Vahidi*, M. Ghafouri, M. Au, M. Kassouf, A. Mohammadi, and M. Debbabi. (2022). Security of Wide-Area Monitoring, Protection and Control (WAMPAC) Systems: A Survey on Challenges and Opportunities. *IEEE Communications Surveys and Tutorials*. 25(2): 1294-1335.
Published
Refereed?: Yes, Open Access?: No
13. B. Karimi*, S. Zabihi*, A. Keynia, A. Montazami, A. Mohammadi. (2022). AVCA: Autonomous Virtual Cognitive Assessment. *Transactions on Computational Science*.
Published
Refereed?: Yes, Open Access?: No
14. N. Enshaei, A. Oikonomou, M.J. Rafiee, P. Afshar*, S. Heidarian*, A. Mohammadi, K.N. Plataniotis, and F. Naderkhani. (2022). COVID-Rate: An Automated Framework for Segmentation of COVID-19 Lesions from Chest CT Images. *Nature Scientific Reports*. 12(1)
Published
Refereed?: Yes, Open Access?: Yes

15. M. Salimibeni*, Z. Hajiakhondi*, A. Mohammadi, Y. Wang. (2022). B-ICT: A Trustworthy Blockchain-Enabled System for Indoor Contact Tracing in Epidemic Control. *IEEE Internet of Things Journal*. 10(7): 5992-601.
Published
Refereed?: Yes, Open Access?: No
16. S. Khademi*, S. Heidarian*, P. Afshar*, N. Enshaei, F. Naderkhani, M.J. Rafiee, A. Oikonomou, A. Shafiee, F. Babaki Fard, K.N. Plataniotis, and A. Mohammadi. (2022). Robust Framework for COVID-19 Disease Identification from a Multicenter Dataset of Chest CT Scans. *Plos One*.
Published
Refereed?: Yes, Open Access?: Yes
17. M.A. Atashi*, and A. Mohammadi. (2022). Online Dynamic Window (ODW) Assisted Two-stage LSTM Frameworks for Indoor Localization. *Journal of Signal Processing Systems*.
Published
Refereed?: Yes, Open Access?: No
18. A. Amini*, A. Mohammadi, M. Hou, and A. Asif. (2022). Secure Dynamic Event-triggering Control for Consensus Under Asynchronous Denial of Service. *Frontiers in Computer Science*.
Revision Requested
Refereed?: Yes, Open Access?: Yes
19. R. Karimi*, A. Mohammadi, Amir Asif, H. Benali. (2022). DF-SSmVEP: Dual Frequency Aggregated Steady-State Motion Visual Evoked Potential Design with Bifold Canonical Correlation Analysis. *Sensors*. 22(7)
Published
Refereed?: Yes, Open Access?: Yes
20. M. Salimibeni*, A. Mohammadi, P. Malekzadeh*, K.N. Plataniotis. (2022). Multi-Agent Reinforcement Learning via Adaptive Kalman Temporal Difference and Successor Representation. *Sensors*. 22(4)
Published
Refereed?: Yes, Open Access?: Yes
21. P. Afshar*, M.J. Rafiee, F. Naderkhani, Shahin Heidarian*, N. Enshaei, A. Oikonomou, F. Babaki Fard, R. Anconina, K. Farahani, K.N. Plataniotis, and A. Mohammadi. (2022). Human-level COVID-19 Diagnosis from Low-dose CT Scans Using a Two-stage Time-distributed Capsule Network. *Nature Scientific Reports*. 12(1)
Published
Refereed?: Yes, Open Access?: Yes
22. S. Zabih*, E. Rahimian*, S. Sharma, S.K. Sethi, S. Gharabaghi, A. Asif, E.M. Haacke, M.S. Jog, A. Mohammadi. (2022). Q-Net: A Quantitative Susceptibility Mapping-based Deep Neural Network for Differential Diagnosis of Brain Iron Deposition in Hemochromatosis. *Nature Scientific Reports*.
Submitted
Refereed?: Yes, Open Access?: Yes
23. A. Amini*, A. Asif, and A. Mohammadi. (2022). Fault Tolerant Periodic Event-triggered Consensus Under Communication Delay and Multiple Attacks. *IEEE Systems Journal*.
Published
Refereed?: Yes, Open Access?: No
24. A. Rahiminejad*, J. Plotnek, R. Atallah, M.A. Dubois, D. Malatrait, M. Ghafouri, A. Mohammadi, M. Debbabi. (2022). A Resilience-Based Recovery Scheme for Smart Grid Restoration Following Cyberattacks to Substations. *International Journal of Electrical Power & Energy Systems*.
Published
Refereed?: Yes, Open Access?: No

25. S. Zabihi*, E. Rahimian*, A. Asif, S. Yanushkevich, A. Mohammadi. (2022). Light-weighted CNN-Attention based Architecture Trained with a Hybrid Objective Function for EMG-based Human Machine Interfaces. *Transactions on Computational Science*.
Published
Refereed?: Yes, Open Access?: No
26. E. Rahimian*, S. Zabihi*, A. Asif, D. Farina, S.F. Atashzar, A. Mohammadi. (2022). TEMGNet: Deep Transformer-based Decoding of Upperlimb sEMG for Hand Gestures Recognition. *IEEE Transactions on Medical Robotics and Bionics*.
Submitted
Refereed?: Yes, Open Access?: No
27. Z. HajiAkhondi*, A. Mohammadi, M. Hou, and K. N. Plataniotis. (2022). DQLEL: Deep Q-Learning for Energy-Optimized LoS/NLoS UWB Node Selection. *IEEE Transactions on Signal Processing*. 70: 2532-2547.
Published
Refereed?: Yes, Open Access?: No
28. P. Malekzadeh*, M. Salimibeni*, A. Mohammadi, M. Hou, and K.N. Plataniotis. (2022). AKF-SR: Adaptive Kalman Filtering based Successor Representations. *Neurocomputing*. 476(7): 476-490.
Published
Refereed?: Yes, Open Access?: No
29. A. Amini*, M. Ghafouri, A. Mohammadi, M. Hou, A. Asif, and K.N. Plataniotis. (2022). Secure Sampled-data Observer-based Control for Wind Turbine Oscillation Under Cyber Attacks. *IEEE Transactions on Smart Grid*. 12(4): 3188-3202.
Published
Refereed?: Yes, Open Access?: No
30. S. Zabihi*, E. Rahimian*, F. Marefat, A. Asif, P. Mohseni, and A. Mohammadi. (2022). BP-Net: Cuff-less and Non-invasive Blood Pressure Estimation via a Generic Deep Convolutional Architecture. *Biomedical Signal Processing and Control*. 78
Published
Refereed?: Yes, Open Access?: No
31. M. Roshanzamir, A. Shamsi, H. Asgharnezhad, R. Alizadehsani, S. Hussain, H. Moosaei, A. Mohammadi, R. Acharya, H. Alinejad-Rokny. (2022). Quantifying Uncertainty in Automated Detection of Alzheimer's Patients Using Deep Neural Network. *IEEE Intelligent Systems*.
Accepted
Refereed?: Yes
32. F. Rounaghi*, M. Salimibeni*, F. Naderkhani, and A. Mohammadi. (2022). COVID19-HPSMP: COVID-19 Adopted Hybrid and Parallel Deep Information Fusion Framework for Stock Price Movement Prediction. *Expert Systems with Applications*. 187
Published
Refereed?: Yes, Open Access?: No
33. Z. Hajiakhondi*, A. Mohammadi, J. Abouei, M. Hou, and K.N. Plataniotis. (2022). Joint Transmission Scheme and Coded Content Placement in Cluster-centric UAV-aided Cellular Networks. *IEEE Internet of Things Journal*. 9(13): 11098-11114.
Published
Refereed?: Yes, Open Access?: No
34. A. Amini*, A. Asif, and A. Mohammadi. (2022). A Unified Optimization for Resilient Dynamic Event-Triggering Consensus Under Denial of Service. *IEEE Transactions on Cybernetics*. 52(5)
Published
Refereed?: Yes, Open Access?: No

35. A. Amini*, A. Asif, and A. Mohammadi. (2021). Sampled-data Dynamic Event-triggering Control for Networked Systems Subject to DoS Attacks. *IEEE Transactions on Network Science and Engineering*. 8(3)
Published
Refereed?: Yes, Open Access?: No
36. S. Heidarian*, P. Afshar*, N. Enshaei, F. Naderkhani, A. Oikonomou, S.F. Atashzar, F. Babaki Fard, K. Samimi, K.N. Plataniotis, M.J. Rafiee, and A. Mohammadi. (2021). COVID-FACT: A Fully-Automated Capsule Network-based Framework for Identification of COVID-19 Cases from Chest CT scans. *Frontiers in Artificial Intelligence*. 4
Published
Refereed?: Yes, Open Access?: Yes
37. A. Rasti-Meymandi, A. Madahian, J. Abouei, A. Mirvakili, Z. Hajiakhondi*, A. Mohammadi, and M. Uysal. (2021). Design and Implementation of VLC-based Smart Barrier Gate Systems. *International Journal of Electronics & Communications*.
Published
Refereed?: Yes, Open Access?: No
38. Z. Hajiakhondi*, A. Mohammadi, and J. Abouei. (2021). Deep Reinforcement Learning for Trustworthy and Time-Varying Connection Scheduling in a Coupled UAV-Based Femtocaching Architecture. *IEEE Access*. 9: 32263-32281.
Published
Refereed?: Yes, Open Access?: Yes
39. P. Afshar*, F. Naderkhani, A. Oikonomou, M.J. Rafiee, A. Mohammadi, K.N. Plataniotis. (2021). MIXCAPS: A Capsule Network-based Mixture of Experts for Lung Nodule Malignancy Prediction. *Pattern Recognition*. 16
Published
Refereed?: Yes, Open Access?: No
40. A. Amini*, A. Asif, and A. Mohammadi. (2021). RQ-CEASE: A Resilient Quantized Collaborative Event-triggered Average consensus Sampled-data Framework Under Denial of Service Attack. *IEEE Transactions on Systems, Man and Cybernetics: Systems*. 51(11)
Published
Refereed?: Yes
41. P. Afshar*, S. Heidarian*, N. Enshaei, F. Naderkhani, M.J. Rafiee, A. Oikonomou, F. Babaki Fard, K. Samimi, K.N. Plataniotis, and A. Mohammadi. (2021). COVID-CT-MD: COVID-19 Computed Tomography (CT) Scan Dataset Applicable in Machine Learning and Deep Learning. *Nature Scientific Data*. 8(121)
Published
Refereed?: Yes, Open Access?: Yes
42. D. Farina, A. Mohammadi, T. Adali, N. V. Thakor and K. N. Plataniotis. (2021). Signal Processing for Neurorehabilitation and Assistive Technologies [From the Guest Editors]. *IEEE Signal Processing Magazine*. 38(4)
Published
Refereed?: Yes, Open Access?: No
43. S. Shahtalebi*, S.F. Atashzar, O. Samotus, R.V. Patel, M. Jog, and A. Mohammadi. (2021). NeurDNet: An Artificial Intelligent Approach in Neurological Disorders Classification. *Nature Scientific Reports*. 11
Published
Refereed?: Yes, Open Access?: Yes
44. E. Rahimian*, S. Zabih*, A. Asif, D. Farina, S.F. Atashzar, and A. Mohammadi. (2021). FS-HGR: Few-shot Learning for Hand Gesture Recognition via ElectroMyography. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. 29: 1004-1015.
Published
Refereed?: Yes, Open Access?: Yes

45. A. Mohammadi, Y. Wang, N. Enshaei, P. Afshar*, S. Heidarian*, F. Naderkhani, A. Oikonomou, M.J. Rafiee, H.C.R. Oliveira, S. Yanushkevich, K.N. Plataniotis. (2021). Diagnosis/Prognosis of COVID-19 Chest Images via Machine Learning and Hypersignal Processing: Challenges, opportunities, and applications. *IEEE Signal Processing Magazine*. 38(5): 37-66.
Published
Refereed?: Yes, Open Access?: No
46. P. Afshar*, S. Heidarian*, F. Naderkhani, A. Oikonomou, K.N. Plataniotis, A. Mohammadi. (2020). COVID-CAPS: A Capsule Network-based Framework for Identification of COVID-19 Cases from X-ray Images. *Pattern Recognition Letter*. 138
Published
Refereed?: Yes, Open Access?: No
47. A. Amini*, A. Asif, and A. Mohammadi. (2020). Formation-Containment Control Using Dynamic Event-triggering Mechanism for Multi-agent Systems. *IEEE/CAA Journal of Automatica Sinica*. 7(5)
Published
Refereed?: Yes, Open Access?: No
48. P. Afshar*, A. Oikonomou, F. Naderkhani, P.N. Tyrrell, K.N. Plataniotis, K. Farahani, and A. Mohammadi. (2020). A 3D Multi-scale Capsule Network for Lung Nodule Malignancy Prediction. *Nature Scientific Reports*. 10
Published
Refereed?: Yes, Open Access?: No
49. Z. Hajiakhondi*, J. Abouei, M. Jassemuddin, and A. Mohammadi. (2020). Mobility-Aware Femtocaching Algorithm in D2D Networks Based on Handover. *IEEE Transactions on Vehicular Technology*. 69(9)
Published
Refereed?: Yes, Open Access?: No
50. A. Al-Dulaimi*, A. Mohammadi, and A. Asif. (2020). Noisy Parallel Hybrid Model of NBGRU and NCNN Architectures for Remaining Useful Life Estimation. *Quality Engineering*. 32(3)
Published
Refereed?: Yes, Open Access?: No
51. P. Malekzadeh*, K.N. Plataniotis, and A. Mohammadi. (2020). STUPEFY: Set-Valued Box Particle Filtering for BLE-based Indoor Localization. *IEEE Signal Processing Letters*. 26(12)
Published
Refereed?: Yes, Open Access?: No
52. E.S. Parizy, A.J. Ardakani, A. Mohammadi, and K.A. Loparo. (2020). Co-designed Incentives for an Aimed Renewable Energy Contribution and Volunteer Load Shedding. *IET Renewable Power Generation*. 14(12)
Published
Refereed?: Yes, Open Access?: No
53. S. Hassanhosseini, M.R. Taban, J. Abouei, A. Mohammadi. (2020). Improving Performance of Indoor Localization using Compressive Sensing and Normal Hedge Algorithm. *Turkish Journal of Electrical Engineering Computer Sciences*. 28(4)
Published
Refereed?: Yes, Open Access?: No
54. P. Afshar*, A. Mohammadi, K.N. Plataniotis, A. Oikonomou, H. Benali. (2020). From Hand-Crafted to Deep Learning-based Cancer Radiomics: Challenges and Opportunities. *IEEE Signal Processing Magazine*. 36(4)
Published
Refereed?: Yes, Open Access?: No

55. P. Afshar*, A. Mohammadi, P.N. Tyrrell, K.N. Plataniotis, and A. Oikonomou. (2020). DRTOP: Deep learning-based Radiomics for the Time-to-event Outcome Prediction in Pulmonary Malignancies. *Nature Scientific Reports*. 10
Published
Refereed?: Yes, Open Access?: Yes
56. P. Afshar*, A. Mohammadi, P.N. Tyrrell, K.N. Plataniotis, and A. Oikonomou. (2020). BayesCap: A Bayesian Approach to Brain Tumor Classification Using Capsule Networks. *IEEE Signal Processing Letters*. 27: 2024-2028.
Published
Refereed?: Yes, Open Access?: No
57. S. Parizy, A.J. Ardakani, A. Mohammadi, and K.A. Loparo. (2020). A New Quantitative Load Profile Measure for Demand Response Performance Evaluation. *International Journal of Electrical Power and Energy Systems*. 121
Published
Refereed?: Yes, Open Access?: No
58. E. Rahimian*, S. Zabihi*, S.F. Atashzar, A. Asif, and A. Mohammadi. (2020). Surface EMG-Based Hand Gesture Recognition via Hybrid and Dilated Deep Neural Network Architectures for Neurorobotic Prostheses. *Journal of Medical Robotics Research*. 5(1)
Published
Refereed?: Yes, Open Access?: No
59. P. Malekzadeh*, M. Salimibeni*, A. Mohammadi, A. Assa, and K.N. Plataniotis. (2020). MM-KTD: Multiple Model Kalman Temporal Differences for Reinforcement Learning. *IEEE Access*. 8: 128716-128729.
Published
Refereed?: Yes, Open Access?: Yes
60. S. Shahtalebi*, S.F. Atashzar, O. Samotus, R.V. Patel, M. Jog, and A. Mohammadi. (2020). PHTNet: Characterization and Deep Mining of Involuntary Pathological Hand Tremor using Recurrent Neural Network Models. *Nature Scientific Reports*. 10
Published
Refereed?: Yes, Open Access?: Yes
61. A. Amini*, A. Asif, and A. Mohammadi. (2019). A Performance Guaranteed Sampled-data Event-triggered Consensus Approach for Linear Multi-agent Systems. *Information Science*. 484
Published
Refereed?: Yes, Open Access?: No
62. A. Al-Dulaimi*, S. Zabihi*, A. Asif, A. Mohammadi. (2019). A Multiple-Model and Hybrid Deep Neural Network Model for Remaining Useful Life Estimation. *Computers in Industry*. 108: 186-196.
Published
Refereed?: Yes
63. S. Shahtalebi*, S.F. Atashzar, R. Patel, A. Mohammadi. (2019). WAKE: Wavelet Decomposition Coupled with Adaptive Kalman Filtering for Pathological Tremor Extraction. *Biomedical Signal Processing and Control*. 48: 179-188.
Published
Refereed?: Yes
64. A. Mohammadi, P. Afshar*, A. Asif, K. Farahani, J. Kirby, A. Oikonomou, K.N. Plataniotis. (2019). Lung Cancer Radiomics: Highlights from the IEEE Video and Image Processing Cup 2018 Student Competition. *IEEE Signal Processing Magazine*. 39(1): 164-173.
Published
Refereed?: Yes

65. S. Shahtalebi*, S.F. Atashzaar, R. Patel, A. Mohammadi. (2019). HMFP-DBRNN: Real-time Hand Motion Filtering and Prediction via Deep Bidirectional RNN for Robotic Rehabilitation Systems. *IEEE Robotics and Automation Letters*. 4(2): 1061-1068.
Published
Refereed?: Yes
66. A. Al-Dulaimi*, S. Zabihi*, A. Asif, and A. Mohammadi. (2019). Noisy Hybrid Neural Network Architecture for Remaining Useful Life Estimation. *Computing and Information Science in Engineering*.
Published
Refereed?: Yes, Open Access?: No
67. A. Mohammadi, P. Cheng, V. Piuri, K. Plataniotis, P. Campisi. (2018). [Guest Editorial] Distributed Signal Processing for Security and Privacy in Networked Cyber-Physical Systems. *IEEE Trans. Signal and Information Processing over Networks*. 4(1): 1-3.
Published
Refereed?: Yes
68. A. Mohammadi, S. Davar*, K.N. Plataniotis. (2018). Ternary Event-based State Estimation with Joint Point, Quantized, and Set-valued Measurements. *IEEE Signal Processing Letters*. 25(5): 665 - 669.
Published
Refereed?: Yes
69. A. Amini*, A. Asif, A. Mohammadi. (2018). CEASE: A Collaborative Event-Triggered Average-Consensus Sampled-Data Framework With Performance Guarantees for Multi-Agent Systems. *IEEE Transactions on Signal Processing*. 66(23): 6069-6109.
Published
Refereed?: Yes
70. H. Sadreazami*, A. Asif, A. Mohammadi. (2018). Iterative Graph-based Filtering for Image Abstraction and Stylization. *IEEE Transactions on Circuits and Systems II: Express Briefs*. 65(2): 251-255.
Published
Refereed?: Yes, Open Access?: No
71. A. Mohammadi, K.N. Plataniotis. (2018). Non-Circular Attacks on Phasor Measurement Units for State Estimation in Smart Grid. *Journal of Selected Topics in Signal Processing*. 12(4): 777-789.
Published
Refereed?: Yes
72. S. Shahtalebi*, A. Mohammadi. (2018). Bayesian Optimized Spectral Filters Coupled with Ternary ECOC for Single Trial EEG Classification. *IEEE Transactions on Neural Systems and Rehabilitation Engineering*. 26(12): 2249-2259.
Published
Refereed?: Yes
73. A. Mohammadi, C. Yang, Q. Chen. (2018). Attack Detection/Isolation via a Secure Multi-Sensor Fusion Framework for Cyber-Physical Systems. *Complexity*.
Published
Refereed?: Yes

Conference Publications

1. M. Salimibeni*, A. Mohammadi. (2023). Hybrid Indoor Localization via Reinforcement Learning-based Information Fusion. *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*,
Paper
Published
Refereed?: Yes, Invited?: Yes

2. A. Rahiminejad*, O. Duman, M. Ghafouri, R. Atallah, A. Mohammadi, M. Debbabi. (2023). A Resilience Quantitative Framework for Wide Area Damping Control Against Cyberattacks. IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT),
Paper
Published
Refereed?: Yes, Invited?: No
3. S. Zabihi*, E. Rahimian*, A. Asif, A. Mohammadi. (2023). Light-weighted CNN-Attention based architecture for Hand Gesture Recognition via ElectroMyography. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
4. S. Khademi*, S. Heidarian*, P. Afshar*, F. Naderkhani, A. Oikonomou, K.N. Plataniotis, A. Mohammadi. (2023). Spatio-Temporal Hybrid Fusion of CAE and SWIn Transformers for Lung Cancer Malignancy Prediction. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
5. Z. HajiAkhondi*, A. Mohammadi, M. Hou, J. Abouei, K.N. Plataniotis. (2023). ViT-CAT: Parallel Vision Transformers with Cross Attention Fusion for Popularity Prediction in MEC Networks. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
6. M. Montazerin*, E. Rahimian*, F. Naderkhani, S.F. Atashzar, H. Alinejad-Rokny, A. Mohammadi. (2023). HYDRA-HGR: A Hybrid Transformer-based Architecture for Fusion of Macroscopic and Microscopic Neural Drive Information. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
7. M. Montazerin*, S. Zabihi*, E. Rahimian*, A. Mohammadi, F. Naderkhani. (2022). ViT-HGR: Vision Transformer-based Hand Gesture Recognition from High Density Surface EMG Signals. 44th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC),
Paper
Published
Refereed?: Yes, Invited?: No
8. S. Vahidi*, A. Amini*, M. Ghafouri, M. Au, A. Mohammadi, and M. Debbabi. (2022). Resilient Periodic Observer-based Control For Wide Area Oscillation Damping Against Time Synchronization Attack. Innovative Smart Grid Technologies (ISGT),
Paper
Published
Refereed?: Yes, Invited?: No
9. A. Rahiminejad*, M. Ghafouri, R. Atallah, A. Mohammadi, and M. Debbabi. (2022). A Cyber-Physical Resilience-Based Survivability Metric against Topological Cyberattacks. Innovative Smart Grid Technologies (ISGT),
Paper
Published
Refereed?: Yes, Invited?: No

10. Z. Hajiakhondi*, M. Hou, and Arash Mohammad. (2022). JUNO: Jump-Start Reinforcement Learning-based Node Selection for UWB Indoor Localization. IEEE Global Communications Conference (GLOBECOM), Paper
Published
Refereed?: Yes, Invited?: No
11. Z. Hajiakhondi*, M. Hou, A. Mohammadi. (2022). Content Placement in a Cluster-Centric Mobile Edge Caching Network. IEEE International Conference on Networking, Sensing and Control (IEEE ICNSC), Paper
Published
Refereed?: Yes, Invited?: Yes
12. N. Enshaei, M.J. Rafiee, A. Mohammadi, and F. Naderkhani. (2022). Data Shapley Value for Handling Noisy Labels: An application in Screening COVID-19 Pneumonia from Chest CT Scans. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Paper
Published
Refereed?: Yes, Invited?: No
13. B. Karimi*, S. Zabihi*, M. Salimibeni*, A. Mohammadi. (2022). Autonomous Virtual Cognitive Assessment via NLP and Hand Gesture Recognition. IEEE Asilomar Conference on Signals, Systems, and Computers, Paper
Published
Refereed?: Yes, Invited?: Yes
14. E. Rahimian*, S. Zabihi*, A. Asif, D. Farina, S.F. Atashzar, and A. Mohammadi. (2022). Hand Gesture Recognition Using Temporal Convolutions and Attention Mechanism. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Paper
Published
Refereed?: Yes, Invited?: No
15. D.E. Rebbah, A. Ebtia*, M. Ghafouri, M. Kassouf, R. Atallah, M. Debbabi, and A. Mohammadi. (2022). Real-Time Co-simulation Platform for Security Analysis of Distribution Automation Systems. Innovative Smart Grid Technologies (ISGT), Paper
Published
Refereed?: Yes, Invited?: No
16. Z. Hajiakhondi*, A. Mohammadi, E. Rahimian*, S. Heidarian*, J. Abouei, and K.N. Plataniotis. (2022). TEDGE-Caching: Transformer-based Edge Caching Towards 6G Network. IEEE International Conference on Communication (ICC), Paper
Published
Refereed?: Yes, Invited?: No
17. S. Heidarian*, P. Afshar*, F. Naderkhani, M.J. Rafiee, A. Oikonomou, K.N. Plataniotis, and A. Mohammadi. (2021). Hybrid Deep Learning Model for Diagnosis of COVID-19 using CT Scans and Clinical/Demographic Data. IEEE International Conference on Image Processing (ICIP), Paper
Published
Refereed?: Yes, Invited?: No

18. M. Salimibeni*, P. Malekzadeh*, A. Mohammadi, P. Spachos, and, K.N. Plataniotis. (2021). MAKF-SR: Multi-Agent Adaptive Kalman Filtering-Based Successor Representations. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: Yes
19. A. Atashi*, and A. Mohammadi. (2021). Online Dynamic Window (ODW) Assisted 2-Stage LSTM Indoor Localization for Smart Phones. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
20. Y. Wang, I. Pitas, K. N. Plataniotis, C.S. Regazzoni, B.M. Sadler, A. Roy-Chowdhury, M. Hou, A. Mohammadi, L. Marcenaro, F.S. Atashzar, and S. alZahir. (2021). On Future Development of Autonomous Systems: A Report of the Plenary Panel at IEEE ICAS'21. IEEE International Conference on Autonomous Systems (ICAS),
Paper
Published
Refereed?: Yes, Invited?: Yes
21. Y. Wang, K. N. Plataniotis, A. Mohammadi, L. Marcenaro, A. Asif, M. Hou, H. Leung, and M. Gavrilova. (2021). Perspectives on the Emerging Field of Autonomous Systems and its Theoretical Foundations. IEEE International Conference on Autonomous Systems (ICAS),
Paper
Published
Refereed?: Yes, Invited?: Yes
22. E. Rahimian*, S. Zabihi*, A. Asif, S.F. Atashzar, and A. Mohammadi. (2021). Trustworthy Adaptation with Few-Shot Learning for Hand Gesture Recognition. IEEE International Conference on Autonomous Systems (ICAS),
Paper
Published
Refereed?: Yes, Invited?: No
23. N. Enshaei, P. Afshar*, S. Heidarian*, A. Mohammadi, M.J. Rafiee, A. Oikonomou, F. Babaki Fard, K.N. Plataniotis, and F. Naderkhani. (2021). An Ensemble Learning Framework For Multi-Class Covid-19 Lesion Segmentation From Chest Ct Images. IEEE International Conference on Autonomous Systems (ICAS),
Paper
Published
Refereed?: Yes, Invited?: No
24. Y. Wang, S. Yanushkevich, A. Mohammadi, K. N. Plataniotis, M. Coates, B. Fidan, M.L. Gavrilova, Y. Hu, F. Karray, H. Leung, and M. Hou. (2021). Advances in Autonomous Systems: A Summary of the AutoDefence Summer School at IEEE ICAS'21. IEEE International Conference on Autonomous Systems (ICAS),
Paper
Published
Refereed?: Yes, Invited?: Yes
25. A. Rasti-Meymandi, J. Abouei, Z. Hajiakhondi*, A. Mohammadi, and, A. Asif. (2021). Fast Machine Learning-based Signal Classification in Energy Constrained CRN: FPGA Design and Implementation. IEEE International Conference on Autonomous Systems (ICAS),
Paper
Published
Refereed?: Yes, Invited?: No

26. S. Zabihi*, E. Rahimian*, Amir Asif, and A. Mohammadi. (2021). SepUnet: Depthwise Separable Convolution Integrated U-Net For MRI Reconstruction. IEEE International Conference on Image Processing (ICIP),
Paper
Published
Refereed?: Yes, Invited?: No
27. S. Heidarian*, P. Afshar*, A. Mohammadi, M.J. Rafiee, A. Oikonomou, K.N. Plataniotis, and F. Naderkhani. (2021). CTCAPS: Feature Extraction-based Automated Framework for COVID-19 Disease Identification from Chest CT Scans using Capsule Networks. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
28. S. Heidarian*, P. Afshar*, N. Enshaei, F. Naderkhani, M.J. Rafiee, A. Oikonomou, F. Babaki Fard, A. Shafiee, K.N. Plataniotis, and A. Mohammadi. (2021). WSO-CAPS: Diagnosis Of Lung Infection From Low And Ultra-Lowdose CT Scans Using Capsule Networks And Windowsetting Optimization. IEEE International Conference on Autonomous Systems (ICAS),
Paper
Published
Refereed?: Yes, Invited?: No
29. Z. Hajiakhondi*, M. Salimibeni*, A. Mohammadi, and, K.N. Plataniotis. (2021). Bluetooth Low Energy and CNN-based Angle of Arrival Localization in Presence of Rayleigh Fading. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
30. B. Sarhadi, J. Abouei, Z. Hajiakhondi*, A. Mohammadi, and K. N. Plataniotis. (2021). Streaming Compression Multimedia Data over WMSNs based on Fairness Cluster-based Routing Protocol. IEEE International Conference on Systems, Man, and Cybernetics (SMC),
Paper
Published
Refereed?: Yes, Invited?: No
31. E. Rahimian*, S. Zabihi*, A. Asif, S.F. Atashzar, and A. Mohammadi. (2021). Few-Shot Learning for Decoding Surface Electromyography for Hand Gesture Recognition. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
32. A. Al-Dulaimi*, A. Asif, and A. Mohammadi. (2020). Multipath Parallel Hybrid Deep Neural Networks Framework for Remaining Useful Life Estimation. IEEE International Conference on Prognostics and Health Management (PHM),
Paper
Published
Refereed?: Yes, Invited?: No
33. E. Rahimian*, S. Zabihi*, S.F. Atashzar, Amir Asif, and A. Mohammadi. (2020). XceptionTime: Independent Time-Window xceptiontime architecture for hand gesture classification.IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), (1304-1308)
Paper
Published
Refereed?: Yes, Invited?: No

34. Y. Wang, S.N. Yanushkevich, M. Hou, K.N. Plataniotis, M. Coates, M. Gavrilova, Y. Hu, F. Karray, H. Leung, A. Mohammadi, S. Kwong, E.W. Tunstel, L. Trajkovic, I.J. Rudas, J. Kacprzyk. (2020). A Tripartite Theory of Trustworthiness for Autonomous Systems. IEEE International Conference on Systems, Man, and Cybernetics (SMC),
Paper
Published
Refereed?: Yes, Invited?: Yes
35. M. Asadi, J. Abouei, Z. Hajiakhondi*, M. Mazidi, and A. Mohammadi. (2020). FDIA Detection through an Adaptive Multi- Level Features Classification in Smart Grids. IEEE International Conference on Systems, Man, and Cybernetics (SMC),
Paper
Published
Refereed?: Yes, Invited?: No
36. A. Al-Dulaimi*, A. Mohammadi, and A. Asif. (2020). Remaining Useful Life Estimation via Hybrid of NBGRU and CNN. Institute of Industrial & Systems Engineers (IISE) Annual Conference & Expo,
Paper
Published
Refereed?: Yes, Invited?: No
37. A. Amini*, A. Asif, and A. Mohammadi. (2020). Dynamic Event-triggered Formation Control for Multi-agent Systems: A Co-design Optimization Approach. IEEE American Control Conference (ACC),
Paper
Published
Refereed?: Yes, Invited?: No
38. Z. Hajiakhondi*, M. Salimibeni*, K. N. Plataniotis, and A. Mohammadi. (2020). Bluetooth Low Energy-based Angle of Arrival Estimation via Switch Antenna Array for Indoor Localization. IEEE International Conference on Information Fusion,
Paper
Published
Refereed?: Yes, Invited?: No
39. P. Afshar*, A. Oikonomou, K.N. Plataniotis, and A. Mohammadi. (2020). MDR-SURV: a Multi-scale Deep Learning-based Radiomics for SURVival Prediction in Pulmonary Malignancies. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
40. P. Afshar*, K. N. Plataniotis, and A. Mohammadi. (2020). BoostCaps: A Boosted Capsule Network for Brain Tumor Classification. IEEE Engineering in Medicine and Biology Conference (EMBC),
Paper
Published
Refereed?: Yes, Invited?: No
41. P. Malekzadeh*, S. Mehryar, P. Spachos, K.N. Plataniotis, A. Mohammadi. (2020). Non-Gaussian BLE-based Indoor Localization via Gaussian Sum Filtering Coupled with Wasserstein Distances. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: Yes

42. F. Ronaghi*, M. Salimibeni*, F. Naderkhani, and A. Mohammadi. (2020). ND-SMPF: A Noisy Deep Neural Network Fusion Framework for Stock Price Movement Prediction. IEEE International Conference on Information Fusion,
Paper
Published
Refereed?: Yes, Invited?: No
43. A. Al-Dulaimi*, A. Mohammadi, and A. Asif. (2020). Noisy Parallel, Hybrid Model for Remaining Useful Life Estimation (NPHM). Institute of Industrial & Systems Engineers (IISE) Annual Conference & Expo,
Paper
Published
Refereed?: Yes, Invited?: No
44. M. Salimibeni*, P. Malekzadeh*, K.N. Plataniotis, and A. Mohammadi. (2020). Distributed Hybrid Kalman Temporal Differences for Reinforcement Learning. IEEE Asilomar Conference on Signals, Systems, and Computers,
Paper
Published
Refereed?: Yes, Invited?: Yes
45. R. Karimi*, L. Rosero*, Amir Asif, and A. Mohammadi. (2020). Deep Video Canonical Correlation Analysis for Steady State motion Visual Evoked Potential Feature Extraction. European Signal Processing Conference (EUSIPCO),
Paper
Published
Refereed?: Yes, Invited?: No
46. M. Salimibeni*, Z. Hajiakhondi*, P. Malekzadeh*, M.A. Atashi*, K.N. Plataniotis, A. Mohammadi. (2020). IoT-TD: IoT Dataset for Multiple Model BLE-based Indoor Tracking. European Signal Processing Conference (EUSIPCO),
Paper
Published
Refereed?: Yes, Invited?: No
47. M.A. Atashi*, M. Salimibeni*, P. Malekzadeh*, Z. Hajiakhondi*, K.N. Plataniotis, A. Mohammadi. (2020). Orientation- Matched Multiple Modeling for RSSI-based Indoor Localization via BLE Sensors. European Signal Processing Conference (EUSIPCO),
Paper
Published
Refereed?: Yes, Invited?: No
48. E. Rahimian*, S. Zabihi*, A. Asif, and A. Mohammadi. (2020). Hybrid Deep Neural Networks for Sparse Surface EMG-Based Hand Gesture Recognition. IEEE Asilomar Conference on Signals, Systems, and Computers,
Paper
Published
Refereed?: Yes, Invited?: Yes
49. Z. Hajiakhondi*, M. Salimibeni*, A. Mohammadi, and K.N, Plataniotis. (2020). Bluetooth Low Energy-based Angle of Arrival Estimation in Presence of Rayleigh Fading. IEEE International Conference on Systems, Man, and Cybernetics (SMC),
Paper
Published
Refereed?: Yes, Invited?: No

50. S. Shahtalebi*, A. Asif, A. Mohammadi. (2020). Siamese Neural Networks for EEG-based Brain-computer Interfaces. IEEE Engineering in Medicine and Biology Conference (EMBC),
Paper
Published
Refereed?: Yes, Invited?: No
51. A. Amini*, A. Asif, and A. Mohammadi. (2019). Quantized Event-triggered Sampled-data Average Consensus with Guaranteed Rate of Convergence. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
52. M. Salimibeni*, P. Malekzadeh*, M.A. Atashi*, M. Barbulescu, K.N. Plataniotis, A. Mohammadi. (2019). Event-Triggered Monitoring/Communication of Inertial Measurement Unit for IoT Applications. IEEE Sensors,
Paper
Published
Refereed?: Yes, Invited?: No
53. E. Rahimian*, S. Zabihi*, A. Asif, and A. Mohammadi. (2019). sEMG-Based Hand Gesture Recognition via Dilated Convolutional Neural Networks. IEEE Global Signal Processing Conference (GlobalSIP),
Paper
Published
Refereed?: Yes, Invited?: No
54. P. Afshar*, K.N. Plataniotis, and A. Mohammadi. (2019). Capsule Networks for Brain Tumor Classification based on MRI Images and Course Tumor Boundaries. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
55. M.A. Atashi*, M. Salimibeni*, P. Malekzadeh*, M. Barbulescu, K.N. Plataniotis, A. Mohammadi. (2019). Multiple Model BLE-based Tracking via Validation of RSSI Fluctuations Under Different Conditions. IEEE International Conference on Information Fusion,
Paper
Published
Refereed?: Yes, Invited?: No
56. P. Afshar*, K.N. Plataniotis, and A. Mohammadi. (2019). Explainable Capsule Networks for Cancer Radiomics. IEEE International Conference on Image Processing (ICIP),
Paper
Published
Refereed?: Yes, Invited?: Yes
57. S. Shahtalebi*, S.F. Atashzar, R.V. Patel, A. Mohammadi. (2019). Training of Deep Bidirectional RNNs for Hand Motion Filtering via Multimodal Data Fusion. IEEE Global Signal Processing Conference (GlobalSIP),
Paper
Published
Refereed?: Yes, Invited?: No
58. A. Amini*, A. Azarbahram, A. Mohammadi, and A. Asif. (2019). Resilient Event-triggered Average Consensus Under Denial of Service Attack and Uncertain Network. IEEE International Conference on Control, Decision and Information Technologies (CoDIT),
Paper
Published
Refereed?: Yes, Invited?: Yes

59. A. Amini*, Z. Zeinali, A. Asif, and A. Mohammadi. (2019). Performance Constrained Distributed Event-triggered Consensus in Multi-agent Systems. IEEE American Control Conference (ACC),
Paper
Published
Refereed?: Yes, Invited?: No
60. M. Mirgholami*, S. Shahtalebi*, R. Karimi*, A. Asif, and A. Mohammadi. (2019). Adaptive Subject-Specific Bayesian Spectral Filtering for Single Trial EEG Classification. IEEE Global Signal Processing Conference (GlobalSIP),
Paper
Published
Refereed?: Yes, Invited?: No
61. P. Malekzadeh*, M. Salimibeni*, M.A. Atashi*, M. Barbulescu, K.N. Plataniotis, A. Mohammadi. (2019). Gaussian Mixture- Based Indoor Localization via Bluetooth Low Energy Sensors. IEEE Sensors,
Paper
Published
Refereed?: Yes, Invited?: No
62. R. Karimi*, L. Rosero*, M. Mirgholami*, Amir Asif, and A. Mohammadi. (2019). Study on Novel Designs with Reduced Fatigue for Steady State Motion Visual Evoked Potentials. IEEE Global Signal Processing Conference (GlobalSIP),
Paper
Published
Refereed?: Yes, Invited?: No
63. A. Al-Dulaimi*, S. Zabihi*, A. Asif, and A. Mohammadi. (2019). A Hybrid Deep Neural Network Framework for Estimating Remaining Useful Life in Prognostic Health Management Industrial Applications. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
64. S. Shahtalebi* and A. Mohammadi. (2019). Feature Space Reduction for Single Trial EEG Classification based on Wavelet Decomposition. IEEE International Engineering in Medicine and Biology Conference (EMBC),
Paper
Published
Refereed?: Yes, Invited?: No
65. S. Mehryar, P. Malekzadeh*, S. Mazuelas, P. Spachos, K.N. Plataniotis, and A. Mohammadi. (2019). Belief Condensation Filtering for RSSI-based State Estimation in Indoor Localization. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: Yes
66. G. Kalantar*, A. Mohammadi, N. Sadrieh. (2018). Analyzing the Effect of Bluetooth Low Energy (BLE) with Randomized MAC Addresses in IoT Applications. IEEE International Conference on Internet of Things (iThings),
Paper
Published
Refereed?: Yes, Invited?: No

67. G. Kalantar*, M. Mirgholami*, Amir Asif, and A. Mohammadi. (2018). Improving the Performance of Motor Imagery EEG-based BCIs via an Adaptive Epoch Trimming Mechanism. IEEE Global Signal Processing Conference (GlobalSIP),
Paper
Published
Refereed?: Yes, Invited?: No
68. A. Amini*, A. Mohammadi, A. Asif. (2018). Resilient Event-Triggered Consensus with Exponential Convergence in Multi-agent Systems. IEEE American Control Conference (ACC),
Paper
Published
Refereed?: Yes, Invited?: No
69. P. Afshar*, A. Shahroudnejad, A. Mohammadi. (2018). CARISI: Convolutional Autoencoder-based Inter-Slice Interpolation of Brain Tumor Volumetric Images. IEEE International Conference on Image Processing (ICIP),
Paper
Published
Refereed?: Yes, Invited?: No
70. S. Davar*, A. Mohammadi, K. Plataniotis. (2018). Autonomous and self-aware systems, Autonomous Vehicles, Event-triggered estimation, Particle filtering. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP): Special Session on Signal Processing for Autonomous and Self Aware systems,
Paper
Published
Refereed?: Yes, Invited?: Yes
71. A. Amini*, A. Asif, A. Mohammadi. (2018). A Robust Event-Triggered Consensus Strategy for Linear Multiagent Systems with Uncertain Network Topology. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
72. A. Al-Dulaimi*, A. Mohammadi, A. Asif. (2018). Interactive Multiple Model Particle Filters for Generalized Degradation Path Modeling. Institute of Industrial & Systems Engineers (IISE) Annual Conference & Expo,
Paper
Published
Refereed?: Yes, Invited?: No
73. A. Shahroudnejad, P. Afshar*, K.N. Plataniotis, and A. Mohammadi. (2018). Improved Explainability of Capsule Networks: Relevance Path by Agreement. IEEE Global Conference on Signal and Information Processing,
Paper
Published
Refereed?: Yes, Invited?: No
74. G. Kalantar*, S. Mukhopadhyay, F. Marefat, P. Mohseni, A. Mohammadi. (2018). WAKE-BPAT: Wavelet based Adaptive Kalman Filtering for Blood Pressure Estimation via Fusion of Pulse Arrival Times. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No

75. A. Amini*, A. Asif, A. Mohammadi. (2018). An Event-triggered Average Consensus Algorithm with Performance Guarantees for Distributed Sensor Networks. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
76. V. Khorasani, A. Mohammadi, S. Atashzar, R. Patel. (2018). Multiple-Model and Reduced-Order Kalman Filtering for Pathological Hand Tremor Extraction. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
77. S. Shahtalebi*, A. Mohammadi. (2018). A Bayesian Framework to Optimize Double Band Spectra Spatial Filters for Motor Imagery Classification. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Published
Refereed?: Yes, Invited?: No
78. P. Afshar*, A. Mohammadi, K. Plataniotis. (2018). Tumor Classification via Capsule Nets. IEEE International Conference on Image Processing (ICIP),
Paper
Published
Refereed?: Yes, Invited?: No



Protected when completed

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Template: NSERC_Researcher

Professor Farnoosh Naderkhani

Correspondence language: English

Contact Information

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Address

Primary Affiliation (*)

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Email

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Protected when completed

Professor Farnoosh Naderkhani

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
Persian	Yes	Yes	Yes	Yes	Yes
Turkish	Yes	Yes	Yes	Yes	Yes

Degrees

- 2018/6 Post-doctorate, Industrial and Systems Engineering, Georgia Institute of Technology
Supervisors: Dr. Kamran Paynabar, 2017/9 - 2018/6
- 2017/6 Doctorate, Industrial Engineering, University of Toronto
Supervisors: Prof. Viliam Makis, 2012/1 - 2017/6
- 2009/6 Bachelor's, Industrial Engineering, University of Tehran

Recognitions

- 2023/9 Concordia University Research Award of Excellence - 5,000
Concordia University
Prize / Award
Concordia University Research Fellow for the Award in Category A
- 2023/8 Gina Cody School's Teaching Excellence Award
Concordia University
Prize / Award
Recipient of Gina Cody School of Engineering and Computer Science Teaching Excellence Award in the New Teacher Category
- 2022/5 - 2024/4 Gina Cody Research and innovation Fellowship - 40,000
Concordia University
Prize / Award
Awarded the Gina Cody School of Engineering and Computer Science's Research and Innovation Fellowship Award
- 2017/9 - 2019/9 NSERC Postdoctoral Fellowship (NSERC-PDF) - 90,000
Georgia Institute of Technology
Prize / Award
Postgraduate Scholarship

User Profile

Research Specialization Keywords: Condition Monitoring, Diagnosis/Prognosis Analysis, Predictive Monitoring, Quality Control, Reliability, Survival Analysis

Employment

- 2023/6 Associate Professor
Concordia Institute for Information System Engineering (CIISE), Concordia University
Full-time
Tenure Status: Tenure
- 2018/7 Assistant Professor
Concordia Institute of Information System Engineering, Concordia University
Full-time
Tenure Status: Tenure Track
- 2017/9 - 2018/6 Post-doctoral fellow
Industrial and Systems Engineering, Georgia Institute of Technology
Full-time
Tenure Status: Non Tenure Track
- 2011/9 - 2017/6 Research Assistant
Mechanical and Industrial Engineering (MIE), University of Toronto
Full-time
Tenure Status: Non Tenure Track
Performing research on quality control in economic design of multivariate Bayesian control chart and developing optimal maintenance policy for a partially observable system subject to stochastic degradation.
- 2013/1 - 2016/6 Research Intern and Project Lead
Mechanical and Industrial Engineering (MIE), University of Toronto
Part-time
Tenure Status: Non Tenure Track
Collaborative research program between University of Toronto (U of T) and Bombardier Aerospace Inc. to perform research on different areas such as improving the efficiency of Operations.
- 2011/9 - 2016/5 Teaching Assistant
Mechanical and Industrial Engineering (MIE), University of Toronto
Part-time
Tenure Status: Non Tenure Track
Tutorial and lab teaching assistant for the following courses: (i) MIE364: Methods of Quality Control & Improvement, 4 semesters; (ii) MIE1727H: Statistical Methods of Quality Assurance, 1 semester; (iii) MIE360: Systems Modelling and Simulation, 2 semesters; (iv) MIE367: Cases in Operational Research, 3 semesters.
- 2011/9 - 2012/9 Collaborative Research Assistant
Mechanical and Industrial Engineering (MIE), University of Toronto
Part-time
Tenure Status: Non Tenure Track
Performing research on a collaborative research program between University of Toronto (U of T) and Ministry of Transportation Ontario (MTO) on developing a stochastic approach to model and forecast highway collisions in winter time.

Leaves of Absence and Impact on Research

- 2021/1 - 2022/1 Parental, Concordia University
Maternity Leave: January 2021 to January 2022.

Research Funding History

Awarded [n=5]

- 2023/1 - 2024/12
Principal Applicant
Gina Cody Research & Innovation Fellowship, Grant
Funding Sources:
Concordia University
Total Funding - 40,000
Portion of Funding Received - 40,000
Funding Competitive?: Yes
- 2019/4 - 2024/3
Principal Applicant
Natural Sciences and Engineering Research Council of Canada- ECR supplement, Grant
Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Total Funding - 12,500
Portion of Funding Received - 12,500
Funding Competitive?: Yes
- 2019/4 - 2024/3
Principal Applicant
Natural Sciences and Engineering Research Council of Canada (NSERC)- Discovery Grant (NSERC DG), Grant
Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Total Funding - 130,000
Portion of Funding Received - 13,000
Funding Competitive?: Yes
- 2021/11 - 2023/10
Principal Applicant
Mitacs Cluster, Grant
Funding Sources:
Mathematics of Information Technology and Complex Systems (MITACS) Cluster
Total Funding - 107,000
Portion of Funding Received - 107,000
Funding Competitive?: Yes
- 2021/5 - 2023/4
Co-investigator
Sunnybrook AFP Innovation Fund, Grant
Funding Sources:
Sunnybrook Hospital
Total Funding - 100,000
Portion of Funding Received - 40,000
Funding Competitive?: Yes

Completed [n=2]

- 2018/12 - 2020/12
Principal Applicant
Concordia Start-Up Grant, Grant
Funding Sources:
Concordia University
Total Funding - 50,000
Portion of Funding Received - 50,000
Funding Competitive?: No
- 2017/9 - 2018/6
Principal Applicant
Natural Sciences and Engineering Research Council of Canada (NSERC)-Post doctoral Fellowship (NSERC-PDF), Fellowship
Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Total Funding - 90,000

Portion of Funding Received - 90,000
Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's non-Thesis [n=6]

2020/1 - 2020/5 Academic Advisor	Maryam Raza (Completed) , Concordia University Thesis/Project Title: Application of Advanced Machine Learning Solutions in Quality Control Present Position: Flight science intern at Bombardier Aerospace Inc.
2020/1 - 2020/5 Principal Supervisor	Misha Kindarji (Completed) , Concordia University Thesis/Project Title: Canada Post Process Optimization Present Position: Principal Implementation Project Manager, Ceridian
2020/1 - 2020/5 Principal Supervisor	Uday Tatareddy (Completed) , Concordia University Thesis/Project Title: Detail Walk Through of Predicting Remaining Useful Life using Machine Learning and Deep Learning Present Position: ETL Developer, Wipro
2019/9 - 2019/12 Principal Supervisor	Houman Esmaili Burekheyl (Completed) , Concordia University Thesis/Project Title: Maintenance Management in Aviation Present Position: Data Management Analyst, Pratt & Whitney
2019/5 - 2019/8 Principal Supervisor	Sahil Bohat (Completed) , Concordia University Thesis/Project Title: Deep Learning-based Predictive Maintenance Present Position: Data Scientist, Industry
2018/9 - 2019/5 Principal Supervisor	Hamid Ahmadpanah (Completed) , Concordia University Thesis/Project Title: Fault Detection of a Hydraulic Test Rig based on Real Multi-Sensor Data Present Position: Master Student

Master's Thesis [n=8]

2022/9 - 2025/12 Principal Supervisor	Marzieh Saadat (In Progress) , Concordia University Thesis/Project Title: Prognostic Health Management via Active Learning Solutions Present Position: PhD Student, Concordia University
2022/1 - 2023/9 Principal Supervisor	Mehrnaz Salmani (In Progress) , Concordia University Thesis/Project Title: Deep Neural Networks for Maintenance Management Present Position: Student, Concordia University
2021/9 - 2023/8 Co-Supervisor	Mansooreh Montazerin (Completed) , Concordia University Thesis/Project Title: Deep Learning Methods for Hand Gesture Recognition via High-Density Surface Electromyogram (HD-sEMG) Signals Present Position: PhD Student, University of Southern California
2021/1 - 2023/9 Principal Supervisor	Mehrnaz Mirzaei (In Progress) , Concordia University Thesis/Project Title: Deep Learning-based Reliability Analysis Present Position: Student, Concordia University
2019/9 - 2021/9 Principal Supervisor	Kamyar Azar (Completed) , Concordia University Thesis/Project Title: Hybrid Statistical, Machine Learning, and Deep Learning Models for Fault Diagnosis and Prognosis in Condition-based Maintenance Present Position: Data Scientist, Playground

2019/9 - 2021/8 Co-Supervisor	Farnoush Rounaghi (Completed) , Concordia University Thesis/Project Title: Deep Learning-based Predictive Analysis Present Position: Data Analyst, Rakuten Kobo Inc.
2019/1 - 2021/5 Principal Supervisor	Negar Ghodsi (Completed) , Concordia University Thesis/Project Title: Optimal control of supply chain network with disruption Present Position: Operations Scheduler, Vention Inc.
2019/1 - 2021/5 Principal Supervisor	Safwan Ahmad (Completed) , Concordia University Thesis/Project Title: Hybrid Statistical and Deep Learning Models for Diagnosis and Prognosis in Manufacturing Systems Present Position: Data Specialist, VIA

Doctorate [n=3]

2022/1 - 2025/12 Principal Supervisor	Hengameh Hadian (In Progress) , Concordia University Thesis/Project Title: Condition-based Maintenance via Industrial Internet-of-Things Present Position: PhD Student, Concordia University
2022/1 - 2025/12 Principal Supervisor	Soroosh Shahsafi (In Progress) , Concordia University Thesis/Project Title: Artificial Intelligence-based Predictive Analytics Present Position: PhD Student, Concordia University
2019/5 - 2023/12 Principal Supervisor	Nastaran Enshaei (In Progress) , Concordia University Thesis/Project Title: Radiomics-based Diagnostics and Prognostics Present Position: PhD Candidate, Concordia University

Event Administration

2023/1 - 2023/8	Organizer, GCS GirlSet, Workshop, 2023/1 - 2023/8
2022/1 - 2022/8	Organizer, GCS GirlSet, Workshop, 2022/1 - 2022/8
2021/3 - 2021/3	Lead Special Panel Organizer, Young Women in Engineering, Seminar, 2021/3 - 2021/3
2020/1 - 2020/8	Organizer, GCS GirlSet, Workshop, 2020/1 - 2020/8
2019/9 - 2019/9	Lead Special Panel Organizer, The Future Talent of Quality, Seminar, 2019/9 - 2019/9
2019/1 - 2019/8	Organizer, GCS GirlsSet, Workshop, 2019/1 - 2019/8
2019/2 - 2019/4	Organizer, Sustainable Feet-on-the-Ground Humanitarian Technology, Seminar, 2019/4 - 2019/4
2019/1 - 2019/3	Organizer, Many Faces of Quality Networking, Seminar, 2019/3 - 2019/3
2018/4 - 2018/10	Competition Jury Member, 2018 IEEE Video and Image Processing (VIP) Cup, Conference, 2018/10 - 2018/10
2016/9 - 2017/6	Graduate Student Union Representative, Elected Member of the Association of Mechanical and Industrial Engineering graduate students (AMIGAS)., Association, 2009/9 - 2018/9

Committee Memberships

2019/1	<p>Committee Member, Leadership Board of American Society for Quality (ASQ) Montreal Section, American Society for Quality (ASQ)</p> <p>I serve as the Student Outreach Committee Chair in Montreal section of the ASQ since January 2019 due to my recent involvements, contributions, and activities within the ASQ Society. ASQ is the world's premier professional society for quality scientists and professionals.</p>
2021/1 - 2023/12	<p>Committee Member, IEEE Reliability Society Administrative Committee (AdCom), IEEE Reliability Society (RS)</p>
2021/1 - 2023/12	<p>Committee Member, Student Achievement Award Committee, IEEE Reliability Society (RS)</p>
2022/8 - 2023/7	<p>Chair, Program Chair and Local arrangement Chair, 2023 IEEE International Prognostic and Health Management (PHM) Conference</p> <p>I am serving as a Program Chair at 2023 IEEE International Conference on Prognostic and Health Management (PHM), which is a Flagship Conference of "IEEE Reliability Society". The conference will be held at Concordia University in June 2023.</p>
2021/8 - 2022/7	<p>Chair, Program Chair, 2022 IEEE International Prognostic and Health Management (PHM) Conference</p> <p>I was serving as the Program Chair of 2022 IEEE International Conference on Prognostic and Health Management, which is a Flagship Conference of "IEEE Reliability Society".</p>
2020/8 - 2021/7	<p>Chair, Paper Review Chair, 2021 IEEE International Prognostic and Health Management (PHM) Conference</p> <p>Given success of the 2020 IEEE PHM Conference, I was invited to serve as the Paper Review Chair (Technical Program Chair) for the 2021 PHM.</p>
2019/8 - 2021/7	<p>Chair, Local Arrangement Chair, 2021 IEEE International Conference on Autonomous Systems (IEEE ICAS)</p> <p>I was serving as the Local Arrangement Co-Chair of 2021 IEEE International Conference on Autonomous Systems (ICAS'21), which was a new Flagship Conference of "IEEE Signal Processing Society (SPS)".</p>
2019/8 - 2020/7	<p>Co-chair, Paper Review Vice-Chair, 2020 IEEE International Prognostic and Health Management (PHM) Conference</p> <p>I was the Paper Review Chair (Technical Program Chair) at 2020 IEEE International Conference on Prognostic and Health Management (PHM), which is a Flagship Conference of "IEEE Reliability Society".</p>

Other Memberships

2022/11	<p>Member, Concordia University</p> <p>Member of SGS Horizon Postdoctoral Fellowship Review Committee: I am serving as a member of SGS Horizon Postdoctoral Fellowship Review Committee at Concordia University since November 2022.</p>
2021/9	<p>Member, Concordia University</p> <p>Member of Concordia Applied AI Institute: I am serving as a member of Concordia Applied AI Institute.</p>
2021/1	<p>Member, Concordia University</p> <p>Member of Thermal Spray and Surface Engineering (TSSE) Research Centre: I am serving as a member of Thermal Spray and Surface Engineering (TSSE) Research Centre at Concordia University since 2021.</p>

Publications

Journal Articles

1. Montazerin, M. Rahimian, E. Naderkhani, F. Atashzar, S.F. Yanushkevich, S. Mohammadi, A. (2023). Transformer-based Hand Gesture Recognition via High-Density EMG Signals: From Instantaneous Recognition to Fusion of Motor Unit Spike Trains. *Nature Scientific Reports*.
Revision Requested
Refereed?: Yes, Open Access?: Yes
2. Azar, K. Naderkhani, F. (2023). Haz-Net: Deep Learning-based Cox's Proportional Hazard Network for Maintenance Applications. *IEEE Transactions on Reliability*.
Revision Requested
Refereed?: Yes, Open Access?: No
3. Rasay, H. Naderkhani, F. Azizi, F. (2023). A Mathematical Maintenance Model for a Production System Subject to Deterioration According to a Stochastic Geometric Process. *Annals of Operations Research*.
Submitted
Refereed?: Yes, Open Access?: No
4. Khademi, S. Heidarian, S. Afshar, P. Enshaei, N. Naderkhani, N. Rafiee, M.J. Oikonomou, A. Shafiee, A. Babaki Fard, F. Plataniotis, K.N. Mohammadi, A. (2023). Robust Framework for COVID-19 Identification from a Multicenter Dataset of Chest CT Scans. *Plos One*. 18(3)
Published
Refereed?: Yes, Open Access?: Yes
5. Enshaei, N. Paul, P. Tremblay, S. Naderkhani, F. Ebadi, A. (2023). A Deep Learning-based Automatic Meter Reading System for Real-time Gas Consumption Monitoring “, under review in *Energy Journal*.
Energy Journal.
Submitted
Refereed?: Yes
6. Rasay, H. Azizi, F. Salmani, M. Naderkhani, F. (2023). Joint Optimization of Condition-based Maintenance and Production Rate using Reinforcement Learning Algorithms. *Applied Mathematical Modeling*.
Submitted
Refereed?: Yes, Open Access?: No
7. Naderkhani, F. (2022). Time to Signal Distribution of Multivariate Bayesian Control Chart with Dual Sampling Scheme. *International Journal of Production Research (IJPR)*. 60(20): 6124-614.
Published
Refereed?: Yes
8. Azar, K. Naderkhani, K. (2022). Semi-supervised clustering-based method for fault diagnosis and prognosis: A case study. *Reliability Engineering & System Safety*. 222
Published
Refereed?: Yes, Open Access?: No
9. Rounaghi, F. Salimibeni, M. Naderkhani, F. Mohammadi, A. (2022). COVID19-HPSMP: COVID-19 Adopted Hybrid and Parallel Deep Information Fusion Framework for Stock Price Movement Prediction. *Expert Systems with Applications*. 187
Published
Refereed?: Yes, Open Access?: No
10. Afshar, P. Rafiee, M.J. Naderkhani, F. Heidarian, F. Enshaei, F. Oikonomou, A. Babaki Fard, F. Anconina, R. Farahani, K. Plataniotis, K.N. Mohammadi, A. (2022). Human-level COVID-19 Diagnosis from Lowdose CT Scans Using a Two-stage Time-distributed Capsule Network. *Nature Scientific Reports*. 12
Published
Refereed?: Yes, Open Access?: Yes

11. Rassay, H. Naderkhani, F. (2022). Mathematical Maintenance Model for Manufacturing Systems under Depredations According to a Stochastic Geometric Process. *Applied Mathematical Modeling*.
Submitted
Refereed?: Yes, Open Access?: No
12. Rassay, H. Naderkhani, F. Azizi, F. (2022). Opportunistic Maintenance Integrated Model for a Two-stage Manufacturing Process. *International Journal of Advanced Manufacturing Technology*. 119: 8173–8191.
Published
Refereed?: Yes, Open Access?: No
13. Enshaei, N. Afshar, P. Heidarian, S. Oikonomou, A. Plataniotis, K.N. Rafiee, M.J. Mohammadi, A. Naderkhani, F. (2022). COVID-Rate: An Automated Framework for Segmentation of COVID-19 Lesions from Chest CT Scan. *Nature Scientific Report*. 12
Published
Refereed?: Yes, Open Access?: Yes
14. Mohammadi, A. Wang, Y. Enshaei, N. Afshar, P. Naderkhani, F. Oikonomou, A. Rafiee, M.J. Yanushkevich, S. Oliveira, H.C.R. Plataniotis, K.N. (2021). Diagnosis/Prognosis of COVID-19 Chest Images via Machine Learning and Hypersignal Processing: Challenges, opportunities, and applications. *IEEE Signal Processing Magazine (SPM)*. 38(5)
Published
Refereed?: Yes, Open Access?: No
15. Heidarian, S. Afshar, P. Enshaei, N. Naderkhani, F. Oikonomou, A. Atashzar, S.F. Babaki Fard, F. Samimi, K. Plataniotis, K.N. Mohammadi, A. Rafiee, M.J. (2021). COVID-FACT: A Fully-Automated Capsule Network-based Framework for Identification of COVID-19 Cases from Chest CT scans. *Frontiers in Artificial Intelligence*. 4
Published
Refereed?: Yes, Open Access?: Yes
16. Afshar, P. Heidarian, S. Enshaei, N. Naderkhani, F. Rafiee, M.J. Oikonomou, A. Babaki Fard, F. Samimi, K. Plataniotis, K.N. Mohammadi, A. (2021). COVID-CT-MD: COVID-19 Computed Tomography (CT) Scan Dataset Applicable in Machine Learning and Deep Learning. *Nature Scientific Data*. 8(121)
Published
Refereed?: Yes, Open Access?: Yes
17. Afshar, P. Naderkhani, F. Oikonomou, A. Rafiee, M.J. Mohammadi, A. Plataniotis, K.N. (2021). MIXCAPS: A Capsule Network-based Mixture of Experts for Lung Nodule Malignancy Prediction. *Pattern Recognition*. 116
Published
Refereed?: Yes, Open Access?: No
18. Afshar, P. Heidarian, S. Naderkhani, F. Plataniotis, K.N. Mohammadi A. (2020). COVID-CAPS: A Capsule Network-based Framework for Identification of COVID-19 Cases from X-ray Images. *Pattern Recognition Letter*. 138: 638-643.
Published
Refereed?: Yes
19. Rassay, H. Naderkhani, F. Golmohammadi, A.M. (2020). Designing Variable Sampling Plans based on Lifetime Performance Index under Failure Censoring Reliability Tests. *Journal of Quality Engineering*. 32(3): 354-370.
Published
Refereed?: Yes, Open Access?: No
20. Afshar, P. Oikonomou, A. Naderkhani, F. Tyrrell, P.N. Plataniotis, K.N. Farahani K. Mohammadi, A. (2020). 3D-MCN: A 3D Multi-scale Capsule Network for Lung Nodule Malignancy Prediction. *Nature Scientific Report*.
Published
Refereed?: Yes, Open Access?: Yes

21. Jafari, L., Naderkhani, F., and Makis, V. (2018). Joint Optimization of Maintenance Policy and Inspection Interval for a Two-units Series System using Proportional Hazards Model. Journal of the Operational Research Society. 69(1): 36-48.
Published
Refereed?: Yes, Open Access?: No

Book Chapters

1. Ghodsi, N. Naderkhani, F. Awashti, A. (2021). Optimal Control Policy for a Partially Observable Facility under Stochastic Disruption. Fleet Management and Planning for Sustainable Connected Mobility Systems. : 1-23.
Published, IGI Global
Refereed?: Yes
2. Enshaei, N. Naderkhani, F. (2019). A Comprehensive Review on Advanced Maintenance Strategies for Smart Railways. Interdisciplinary Approaches to Decision Making for Sustainable Supply Chains. : 1-19.
Published, IGI Global
Refereed?: Yes

Conference Publications

1. Mirzaei, M. Saadat, M. Naderkhani, F. (2023). Application of Machine Learning for Anomaly Detection in Printed Circuit Boards Imbalance Data Set. IEEE Conference on Prognostics and Health Management (ICPHM),
Paper
Accepted
Refereed?: Yes, Invited?: Yes
2. Khademi, S. Heidarian, S. Afshar, P. Naderkhani, F. Oikonomou, A. Plataniotis, K.N. Mohammadi, A. (2023). Spatio-Temporal Hybrid Fusion of CAE and SWIn Transformers for Lung Cancer Malignancy Prediction. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Accepted
Refereed?: Yes, Invited?: No
3. Hadian, H. Naderkhani, F. (2023). Deep Learning-Based Models for Wind and Solar Curtailment Forecasting. International Conference on Energy Harvesting, Storage, and Transfer (EHST),
Paper
Accepted
Refereed?: Yes, Invited?: No
4. Montazerin, M. Rahimian, E. Naderkhani, F. Atashzar, S.F. Alinejad-Rokny, H. Mohammadi, A. (2023). HYDRA-HGR: A Hybrid Transformer-based Architecture for Fusion of Macroscopic and Microscopic Neural Drive Information. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP),
Paper
Accepted
Refereed?: Yes, Invited?: No
5. Rasay, H. Azizi, F. Salmani, M. Naderkhani, F. (2023). A Reinforcement Learning Algorithm for Optimal Dynamic Policies of Joint Condition-based Maintenance. IEEE Conference on Prognostics and Health Management (ICPHM),
Paper
Accepted
Refereed?: Yes, Invited?: No

6. Rasay, H. Naderkhani, F. (2022). Reinforcement Learning based on Stochastic Dynamic Programming for Condition-based Maintenance of Deteriorating Production Processes. IEEE International Conference on Prognostics and Health Management, Paper
Published
Refereed?: Yes, Invited?: No
7. Montazerin, M. Zabihi, S. Rahimian, E. Mohammadi, A. Naderkhani, F. (2022). ViT-HGR: Vision transformer-based hand gesture recognition from high density surface EMG signals. 44th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), Paper
Published
Refereed?: Yes, Invited?: No
8. Enshaei, N. Rafiee, M.J. Mohammadi, A. Naderkhani, F. (2022). Data Shapley Value for Handling Noisy Labels: An application in Screening COVID-19 Pneumonia from Chest CT Scans,. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Paper
Published
Refereed?: Yes, Invited?: No
9. Salmani, M. Azizi, F. Rasay, H. Naderkhani, F. (2022). Dynamic Maintenance for Large Scale Identical Parallel Manufacturing Systems Using Reinforcement Learning. The 69th Annual Reliability & Maintainability Symposium (RAMS® 2023), Paper
Published
Refereed?: Yes, Invited?: No
10. Enshaei, N. Rafiee, M.J. Naderkhani, F. (2022). A Generalization Enhancement Approach for Deep Learning Segmentation Models: Application in COVID-19 Lesion Segmentation from Chest CT Images. European Signal Processing Conference (EUSIPCO), Paper
Published
Refereed?: Yes, Invited?: No
11. Azizi, F. Rasay, H. Naderkhani, F. (2022). Dynamic Maintenance of Continuously Monitored Parallel Systems. IEEE International Conference on Prognostics and Health Management (PHM), Paper
Published
Refereed?: Yes, Invited?: No
12. Heidarian, S. Afshar, P. Naderkhani, F. Rafiee, M.J. Oikonomou, A. Plataniotis, K.N. Mohammadi, A. (2021). Hybrid Deep Learning Model for Diagnosis of COVID-19 using CT Scans and Clinical/Demographic Data. IEEE International Conference on Image Processing (ICIP), Paper
Published
Refereed?: Yes, Invited?: No
13. Heidarian, S. Afshar, P. Enshaei, N. Naderkhani, F. Rafiee, M.J. Oikonomou, A. Babaki Fard, F. Shafiee, A. Plataniotis, K.N. Mohammadi, A. (2021). WSO-CAPS: Diagnosis Of Lung Infection From Low And Ultra-Lowdose CT Scans Using Capsule Networks And Windowsetting Optimization. IEEE International Conference on Autonomous Systems (ICAS), Paper
Published
Refereed?: Yes, Invited?: No

14. Heidarian, S. Afshar, P. Mohammadi, A. Rafiee, M.J. Oikonomou, A. Plataniotis, K.N. Naderkhani, F. (2021). CT-CAPS: Feature Extraction-based Automated Framework for COVID-19 Disease Identification from Chest CT Scans using Capsule Networks. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Paper
Published
Refereed?: Yes, Invited?: Yes
15. Enshaei, N. Afshar, P. Heidarian, S. Mohammadi, A. Rafiee, M.J. Oikonomou, FA. Babaki Fard, F. Plataniotis, K.N. Naderkhani, F. (2021). An Ensemble Learning Framework For Multi-Class Covid-19 Lesion Segmentation From Chest Ct Images. IEEE International Conference on Autonomous Systems (ICAS), Paper
Published
Refereed?: Yes, Invited?: Yes
16. Rasay, H. Naderkhani, F. (2021). Comparison of Two Maintenance Policies for the Coordination of Decisions of Quality Control and Maintenance Planning. IEEE International Conference on Prognostics and Health Management, Paper
Published
Refereed?: Yes, Invited?: Yes
17. Azar, K. Naderkhani, F. (2020). Semi-Supervised Learning Approach for Optimizing Condition-based-Maintenance (CBM) Decisions. IEEE International Conference on Prognostics and Health Management, Paper
Published
Refereed?: Yes, Invited?: No
18. Enshaei, N. Naderkhani, F. (2020). Application of Deep Learning for Fault Diagnostic in Induction Machine's Bearings. IEEE International Conference on Prognostics and Health Management, Paper
Published
Refereed?: Yes, Invited?: No
19. Ronaghi, F. Salimibeni, M. Naderkhani, F. Mohammadi, A. (2020). ND-SMPF: A Noisy Deep Neural Network Fusion Framework for Stock Price Movement Prediction. IEEE International Conference on Information Fusion, Paper
Published
Refereed?: Yes, Invited?: No
20. Enshaei, N. Ahmad, S. Naderkhani, F. (2020). Automated detection of textured-surface defects using UNet-based semantic segmentation network. IEEE International Conference on Prognostics and Health Management, Paper
Published
Refereed?: Yes, Invited?: No
21. Ahmad, S. Enshaei, N. Awasthi, A. Naderkhani, F. (2020). Integrated Deep Learning and Statistical Process Control for Online Monitoring of Manufacturing Processes. IEEE International Conference on Prognostics and Health Management, Paper
Published
Refereed?: Yes, Invited?: No

22. Rasay, H. Naderkhani, F. (2020). Designing a Reliability Quick Switching Sampling Plan based on the Lifetime Performance Index. IEEE International Conference on Prognostics and Health Management, Paper
Published
Refereed?: Yes, Invited?: No
23. Ghodsi, N. Naderkhani, F. Awasthi, A. (2019). Application of Markov Decision Process in Facility Location under Disruption. Canadian Operation Research Conference (CORS), Paper
Published
Refereed?: Yes, Invited?: No
24. Ahmad, S. Naderkhani, F. Awasthi, A. (2019). Deep Learning Based Survival Analysis. Canadian Operation Research Conference (CORS), Paper
Published
Refereed?: Yes, Invited?: No



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Dr. Zachary Patterson

Correspondence language: English

Contact Information

The primary information is denoted by (*)

Address

Mailing

1455, blvd. De Maisonneuve ouest
H 1255 - 15
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This is a draft version only. Do not submit to any funding organization. Only the final version from the History page can be submitted.

Protected when completed

Dr. Zachary Patterson

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes

Degrees

- 2008/8 Post-doctorate, Transportation Land-use Modeling, Ecole polytechnique fédérale de Lausanne
Supervisors: Michel Bierlaire, 2006/10 - 2008/9
- 2007/2 Doctorate, Freight Transportation Modeling and the Environment, McGill University
Supervisors: Gordon Ewing, 2003/8 - 2006/5
- 2000/5 Master's Thesis, Transportation/Environmental Economics, Simon Fraser University
Supervisors: Nancy Olewiler, 1997/9 - 2000/5
- 1997/5 Bachelor's, Economic Anthropology, McGill University
Supervisors: Laurel Bossen, 1993/9 - 1997/5

User Profile

Research Specialization Keywords: emerging data, computational geoprocessing, discrete choice experiments, energy use, passenger transportation, passenger travel behaviour, stated preference tech., transp. and environment, transp. land-use modeling, transportation economics

Employment

- 2023/6 Professor
Concordia Institute for Information Systems Engineering, Sir George Williams, Concordia University
Full-time, Professor
Tenure Status: Tenure
- 2021/6 - 2023/6 Associate Professor
Concordia Institute for Information Systems Engineering, Gina Cody School of Business, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure

2016/6 - 2021/5	Associate Professor Geography, Planning and Environment, Faculty of Arts & Sciences, Concordia University Full-time, Associate Professor Tenure Status: Tenure
2010/8 - 2016/5	Assistant Professor Geography, Concordia University Full-time Tenure Status: Tenure Track
2008/9 - 2010/5	Modeling Specialist Information sur la mobilité et transport métropolitain, Agence métropolitaine de transport, Montreal
2007/9 - 2008/6	Co-managing director Urban Utility Management, École Polytechnique Fédérale de Lausanne
2003/9 - 2006/5	PhD Candidate Geography, McGill University Full-time Tenure Status: Non Tenure Track
2005/1 - 2005/5	Teaching Assistant Geography, McGill University Part-time Tenure Status: Non Tenure Track
2004/9 - 2004/12	Teaching Assistant Geography, McGill University Part-time Tenure Status: Non Tenure Track
2004/1 - 2004/5	Teaching Assistant Geography, McGill University Part-time Tenure Status: Non Tenure Track
2000/10 - 2003/8	Economist Environment, Economy and Trade, Commission for Environmental Cooperation
2000/5 - 2000/9	Junior Economist Transportation and Energy Use Division, Natural Resources Canada
1999/1 - 1999/8	Teaching Assistant Economics, Simon Fraser University Part-time Tenure Status: Non Tenure Track

Research Funding History

Awarded [n=6]

2023/5 - 2030/4 Collaborator	Bridging Divides: Migrant Integration in the mid-21st Century, Grant Funding Sources: Canada First Research Excellence Fund Total Funding - 99,253,482 Portion of Funding Received - 2,800,000 Funding Competitive?: Yes
2022/5 - 2027/4	Graph Neural Networks for Transit Passenger Flow Prediction, Grant

Principal Investigator	<p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 180,000 Portion of Funding Received - 180,000 Funding Competitive?: Yes</p>
2021/1 - 2027/2 Principal Investigator	<p>Micro Transit Demand Management (microTDM) - AI & Transit Operations, Grant</p> <p>Funding Sources: Mitacs iPDF Total Funding - 900,000 Portion of Funding Received - 735,000 Funding Competitive?: No</p>
2020/5 - 2027/2 Principal Investigator	<p>Micro Transit Demand Management (microTDM) with Big Data and Artificial Intelligence, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 1,426,666 Portion of Funding Received - 1,336,666 Funding Competitive?: Yes</p> <p>Co-investigator : Nizar Bouguila; Owen Waygood</p>
2018/5 - 2024/4 Co-applicant	<p>Canadian Urban Environmental Health Research Consortium (CANUE), Grant</p> <p>Funding Sources: Canadian Institutes of Health Research (CIHR) Total Funding - 4,200,000 Portion of Funding Received - 60,000 Funding Competitive?: Yes</p> <p>Co-applicant : Dan Rainham; Greg Evans;</p> <p>Principal Applicant : Howard Hu; Jeffrey Brook; Kim Mcgrail; Michael Brauer; Padmaja Subarrao; Philip Awadalla</p>
2021/3 - 2022/4 Principal Investigator	<p>Développement d'indicateurs d'accessibilité pour la production d'analyses multimodales et non comparatives (R860.1), Contract</p> <p>Funding Sources: Ministère des Transports (Québec) Total Funding - 86,000 Portion of Funding Received - 86,000 Funding Competitive?: No</p>
Completed [n=14]	
2022/1 - 2022/12 Principal Investigator	<p>Graph Neural Networks for Transit Data Imputation, Grant</p> <p>Funding Sources: Concordia University Next Generation Cities Institute Total Funding - 5,000 Portion of Funding Received - 5,000 Funding Competitive?: Yes</p>
2021/11 - 2022/5 Principal Applicant	<p>Anticipation de mouvement des usagers dans l'espace d'une intersection avec feu de circulation à partir de données de sources multiples, Grant</p>

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Explore

Total Funding - 5,000

Portion of Funding Received - 5,000

Funding Competitive?: Yes

2021/11 - 2022/5
Principal Applicant

Modélisation de mobilité à l'aide de jumeaux numériques, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

Explore

Total Funding - 5,000

Portion of Funding Received - 5,000

Funding Competitive?: Yes

2017/3 - 2021/3
Co-applicant

Time, Geography, and Food: How time use, social-spatial context, transportation options, and personal economics affect access to food in cities, Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

Insight Grants

Total Funding - 264,305

Portion of Funding Received - 25,000

Funding Competitive?: Yes

Co-applicant : Jason Gililand; Leia Minaker; Steven Farber;

Collaborator : Kristian Larsen;

Principal Applicant : Michael Widener

2018/7 - 2018/12
Principal Applicant

MTL Trajet 2018 - A Smartphone Travel Survey, Contract

Funding Sources:

Ville de Montréal

Total Funding - 23,000

Portion of Funding Received - 23,000

Funding Competitive?: No

2016/5 - 2018/4
Principal Applicant

The DataMobile Partnership: An Open Platform for Spatialized Data Collection and Analysis, Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

Partnership Development Grants

Total Funding - 297,736

Portion of Funding Received - 120,000

Funding Competitive?: Yes

Co-applicant : Benoit Lavigne; Bilal Farooq; Jean-François Cantin; Michael Widener; Steven Farber;

Collaborator : Pierre Tremblay

2017/3 - 2018/3
Principal Applicant

The DataMobile Platform - Research Dissemination and Outreach, Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

Connection Grants

Total Funding - 40,306

Portion of Funding Received - 40,306

2017/7 - 2017/12
Principal Applicant

Funding Competitive?: Yes

MTL Trajet 2017 - A Smartphone Travel Survey, Contract

Funding Sources:
Ville de Montréal
Total Funding - 20,000
Portion of Funding Received - 20,000
Funding Competitive?: No

2017/6 - 2017/12
Principal Applicant

MTL Trajet 2017 - A Smartphone Travel Survey App, Contract

Funding Sources:
Ville de Montreal
Research Contract
Total Funding - 23,000
Portion of Funding Received - 20,000
Funding Competitive?: No

2016/7 - 2017/12
Principal Investigator

CFSMobile - A GPS travel component to the Canada Food Study, Contract

Funding Sources:
University of Waterloo
PHAC: Public Health Agency of Canada Innovation Strategy
Total Funding - 12,650
Portion of Funding Received - 12,650
Funding Competitive?: No

2017/7 - 2017/12
Principal Applicant

City Logger, Contract

Funding Sources:
UofT Transportation Research Institute
TTS 2.0
Total Funding - 20,000
Portion of Funding Received - 17,000
Funding Competitive?: Yes

2016/11 - 2017/11
Principal Applicant

THE DATAMOBILE PLATFORM WORKSHOP, Grant

Funding Sources:
Concordia University
Aid to research related events
Total Funding - 4,910
Portion of Funding Received - 4,910
Funding Competitive?: Yes

2016/11 - 2017/10
Principal Applicant

Aid to Research-related Events for the Itinerum Platform Workshop, Grant

Funding Sources:
Concordia University
Aid to Research-related Events
Total Funding - 5,000
Portion of Funding Received - 5,000
Funding Competitive?: Yes

2016/6 - 2017/6
Principal Applicant

CANADA RESEARCH CHAIR - TIER 2 IN TRANSPORTATION AND LAND USE LINKAGES FOR REGIONAL SUSTAINABILITY - SUPPORT FOR INFRASTRUCTURE UPGRADES, Research Chair

Funding Sources:
Concordia University
SUPPORT FOR INFRASTRUCTURE UPGRADES

Total Funding - 30,000
 Portion of Funding Received - 30,000
 Funding Competitive?: No

Student/Postdoctoral Supervision

Bachelor's [n=2]

- 2022/5 - 2022/9
Co-Supervisor Raghav Narula (Mitacs Globalink Intern) (All But Degree) , Thapar Institute of Engineering and Technology
 Student Degree Expected Date: 2023/5
 Thesis/Project Title: Variational graph convolution network with normalizing flows for passenger flow prediction.
 Present Position: Undergraduate Student
- 2022/5 - 2022/9
Co-Supervisor Mohamed Chaaben (Mitacs Globalink Intern) (Completed) , École Supérieure des communications de Tunis
 Thesis/Project Title: Short-Term Bus Passenger Flow Prediction Using Multi-Component Graph Attention Neural Network Model
 Present Position: Master's student (Concordia Institute for Information Systems Engineering)

Bachelor's Honours [n=4]

- 2020/5 - 2021/8
Principal Supervisor Aaron Bensmihen (Completed) , Concordia University
 Thesis/Project Title: The Multimodal Accessibility Benchmark and Innovation in Canadian Cities.
 Present Position: Master's of Urban Planning Student (McGill University), McGill University - Urban Planning
- 2019/5 - 2020/8
Principal Supervisor Scott McCallum (Completed) , Concordia University
 Thesis/Project Title: Google Location History and Activity Space Stabilization.
 Present Position: Product Owner, MobilityData, MobilityData IO
- 2019/5 - 2021/4
Principal Supervisor Ben Azoulay (Completed) , Concordia University
 Thesis/Project Title: Standardized Reporting Guidelines for Smartphone Travel Surveys.
 Present Position: Area Manager, Amazon, Amazon
- 2017/2 - 2020/5
Principal Supervisor Phillip Veilleux (Completed) , Concordia University
 Thesis/Project Title: GTFS and Transit Accessibility Measures.
 Present Position: Senior Analyst, Canada Mortgage and Housing Corporation, Canada Mortgage and Housing Corporation

Master's Equivalent [n=1]

- 2016/5 - 2018/12
Principal Supervisor Megan Chan (Completed) , Concordia University
 Thesis/Project Title: Applications of smartphone transportation data collection to EIA
 Present Position: Invoicing Representative, Traffic Tech, Traffic Tech

Master's non-Thesis [n=2]

- 2022/11 - 2023/4
Co-Supervisor Mina Amiripour (Completed) , Concordia University
 Thesis/Project Title: Cloud-base Monitoring and Alerting IoT System
 Present Position: Engineer at BusPas, Inc.

2021/9 - 2022/9
Co-Supervisor Kimia Jourabchi (Completed) , Concordia University
Thesis/Project Title: Deep learning for trajectory analysis at intersections with digital twins
Present Position: Quality Control Specialist, Expresco, Concordia University

Master's Thesis [n=15]

2023/9 - 2025/8
Principal Supervisor Isaac Otchere (In Progress) , Concordia University
Student Degree Expected Date: 2025/8
Thesis/Project Title: Long-term residential and mode choice patterns with smartphone travel survey applications
Present Position: Master's student, Concordia Institute for Information Systems Engineering

2023/7 - 2025/6
Co-Supervisor Nadira Nipa (In Progress) , Concordia University
Student Degree Expected Date: 2025/6
Thesis/Project Title: Data fusion and security
Present Position: Master's student, Concordia Institute for Information Systems Engineering

2023/1 - 2024/12
Co-Supervisor Mohamed Chaaben (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Non-zero inflated Graph Neural Network for Transit Passenger Flow Prediction
Present Position: Master's student, Concordia Institute for Information Systems Engineering

2022/10 - 2023/12
Co-Supervisor Pardis Ghazi Amin (Completed) , Concordia University
Thesis/Project Title: AI for computer vision for video analysis for passenger counting at bus stops
Present Position: Master's student, Concordia Institute for Information Systems Engineering

2022/10 - 2023/12
Co-Supervisor Farnaz Kashefinshabouri (Completed) , Concordia University
Thesis/Project Title: Deep learning approaches to Smart Bus Stop energy demand forecasting and management
Present Position: Master's student, Concordia Institute for Information Systems Engineering

2021/9 - 2022/12
Principal Supervisor Sneha Paul (Completed) , Concordia University
Thesis/Project Title: Data modeling and fusion for the development of digital twins of intersections
Present Position: PhD Student, Concordia Institute for Information Systems Engineering, Concordia University

2020/10 - 2021/12
Co-Supervisor Vemuri, Ravi (Completed) , Concordia University
Thesis/Project Title: Bayesian methods for traffic count estimations with video data at intersections
Present Position: Machine Learning Fellow, Fellowship.AI (San Francisco), Concordia University - CIISE

2020/10 - 2022/9
Co-Supervisor Baghdadi, Ali (Completed) , Concordia University
Thesis/Project Title: Load-factor forecasting with online APC and AVL data
Present Position: Senior Cloud Specialist, CGI, Concordia University - CIISE

2020/9 - 2022/9
Co-Supervisor Wood, Hannah (Completed) , Concordia University
Thesis/Project Title: Load-factor forecasting with historical APC and AVL data
Present Position: Cloud Solution Architect, Microsoft, Concordia University - CIISE

2020/5 - 2024/5 Principal Supervisor	Gavin Hermanson (All But Degree) , Concordia University Student Degree Expected Date: 2024/5 Thesis/Project Title: Multimodal accessibility measures in transportation planning Present Position: Transportation Planner, City of New Westminster, Concordia University - Department of Geography
2020/1 - 2021/9 Co-Supervisor	Laffont, Pierre Christophe Marc (Completed) , Polytechnique Montréal Thesis/Project Title: Electrical vehicle forecast requirements to meet CO2 emission goals in Montreal Present Position: Data Analyst, Exo - Réseau de transport métropolitain, Polytechnique Montréal - Civil Engineering
2017/8 - 2018/8 Co-Supervisor	Zhang, Qi (Completed) , Concordia University Thesis/Project Title: Machine learning for information inference from smartphone travel survey data Present Position: Biostatistician, Jewish General Hospital (Montreal), Lady Davis Institute for Medical Research
2017/4 - 2018/8 Co-Supervisor	Akbarzadeh, Hannah (Withdrawn) , Concordia University Thesis/Project Title: Information inference from smartphone travel survey data Present Position: Unknown, Unknown
2017/1 - 2017/5 Co-Supervisor	Hamouni, Parham (Completed) , Concordia University Thesis/Project Title: Information inference from smartphone travel survey data Present Position: Senior Data Scientist, The Kraft Heinz Company, Concordia University
2015/11 - 2017/5 Co-Supervisor	Rezaei, Mohsen (Completed) , Concordia University Thesis/Project Title: Travel mode inference from data collected with smartphone travel survey applications Present Position: Data Engineer - Machine Learning, CGI, Concordia University

Doctorate [n=14]

2024/1 - 2026/12 Principal Supervisor	Farbod Abbasi (In Progress) , Concordia University Student Degree Expected Date: 2026/12 Thesis/Project Title: Deep Learning in Travel Behaviour Analysis and Simulation Present Position: PhD Student, Concordia Institute for Information Systems Engineering
2024/1 - 2026/12 Co-Supervisor	Eric Agyemang (In Progress) , Concordia University Student Degree Expected Date: 2026/12 Thesis/Project Title: Federated Learning in Autonomous IOT Devices Present Position: PhD Student, Concordia Institute for Information Systems Engineering
2024/1 - 2026/12 Principal Supervisor	Houman Haghi (In Progress) , Concordia University Student Degree Expected Date: 2026/12 Thesis/Project Title: Deep Learning Methods in Residential Location Choice Modelling and Simulation Present Position: PhD Student, Concordia Institute for Information Systems Engineering
2023/9 - 2027/8 Principal Supervisor	Mahan Mollajafari (In Progress) , Concordia University Student Degree Expected Date: 2027/8 Thesis/Project Title: Modeling of long-term residential and mode choice decisions of new Canadians Present Position: PhD Student, Concordia Institute for Information Systems Engineering

2023/9 - 2026/12 Co-Supervisor	Amin Fattahi (In Progress) , Polytechnique de Montréal Student Degree Expected Date: 2026/12 Thesis/Project Title: Willingness to Pay for GHG Emissions Reduction in Residential Location Choice Present Position: PhD Student, Polytechnique de Montréal
2023/1 - 2027/12 Co-Supervisor	Sneha Paul (In Progress) , Concordia University Student Degree Expected Date: 2027/12 Thesis/Project Title: AI in computer vision for passenger counting at bus stops Present Position: PhD Student, Mitacs Intern (BusPas, Inc.), Concordia Institute for Information Systems Engineering
2021/9 - 2025/9 Co-Supervisor	Siavash Farazmand (In Progress) , Concordia University Student Degree Expected Date: 2025/9 Thesis/Project Title: Artificial intelligence-based user profiling in transportation planning Present Position: PhD Student, Mitacs Intern (BusPas, Inc.), Concordia University
2021/9 - 2021/12 Principal Supervisor	Saeed Rahmani (In Progress) , Concordia University Thesis/Project Title: Network-based deep-learning approaches in transportation planning Present Position: PhD Student, Delft Technical University, Concordia University
2021/2 - 2022/5 Co-Supervisor	Amirnia, Ashkan (Withdrawn) , Concordia University Thesis/Project Title: Recommender systems for transit itinerary diversion Present Position: Unknown, Concordia University - CIISE
2021/1 - 2025/6 Co-Supervisor	Baghbani, Asiye (In Progress) , Concordia University Student Degree Expected Date: 2025/6 Thesis/Project Title: Graph Neural Networks for Transit Load Factor Forecasting Present Position: PhD Student, Mitacs Intern (BusPas, Inc.), Concordia University - CIISE
2020/9 - 2025/12 Co-Supervisor	Hamed Naseri (In Progress) , Polytechnique Montréal Student Degree Expected Date: 2023/9 Thesis/Project Title: Machine learning methods for estimating transit passenger diversion Present Position: PhD Student, Polytechnique Montréal - Civil Engineering
2019/9 - 2024/12 Co-Supervisor	Roudbari, Naghmeh Shafiee (In Progress) , Concordia University Thesis/Project Title: Automated Data Acquisition Methods for Transportation and Land-use Modeling Present Position: PhD Student, Concordia University - Computer Science
2017/1 - 2021/4 Co-Supervisor	Badu-Marfo, Godwin (Completed) , Concordia University Thesis/Project Title: Methods to ensure server-side confidentiality and security with Big Transport Data Present Position: Senior ML Engineer, Qube Tech, Ryerson University - Civil Engineering
2016/9 - 2020/5 Co-Supervisor	Yazdizadeh, Ali (Completed) , Concordia University Thesis/Project Title: The Application of Artificial Intelligence for Analyzing Traveler Mobility and Activity Patterns with Smartphone Data Present Position: Senior Data Scientist, Metrolinx, Metrolinx
Post-doctorate [n=8]	
2023/7 - 2025/6 Co-Supervisor	Xiaoyu Zhang (In Progress) , Polytechnique de Montréal Student Degree Expected Date: 2025/6 Thesis/Project Title: A Framework for On-demand Transit Simulation Present Position: Postdoctoral Researcher, Polytechnique de Montréal

2023/1 - 2023/12 Co-Supervisor	Mehdi Meshkani (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Recommender systems for on-demand transit dispatching Present Position: Postdoctoral Researcher, Mitacs Intern (BusPas, Inc.), Concordia Institute for Information Systems Engineering
2022/10 - 2023/2 Co-Supervisor	Fereshteh Samadi (Completed) , Concordia University Thesis/Project Title: AI for transit passenger count forecasting Present Position: Postdoctoral Fellow (Ecole de technologie superieure), École de technologie supérieure
2021/1 - 2021/7 Co-Supervisor	Ihou, Eddy (Completed) , Concordia University Thesis/Project Title: User Profiling for transit demand management. Present Position: Data scientist, Zetane Systems Inc., Concordia University - CIISE
2021/1 - 2022/9 Co-Supervisor	Pan Long (Completed) , Polytechnique Montréal Thesis/Project Title: Discrete Choice Experiments for Transit Diversion. Present Position: Assistant Professor, Beijing Jiaotong University, Polytechnique Montréal - Civil Engineering
2020/9 - 2021/10 Co-Supervisor	Muhammad Azam (Completed) , Concordia University Thesis/Project Title: AI for Transit Load Factor Forecasting. Present Position: Artificial Intelligence Lead, Axem Neurotechnology, Concordia University - CIISE
2018/1 - 2021/12 Co-Supervisor	Bobin Wang (Completed) , Polytechnique Montréal Thesis/Project Title: Discrete Choice Experiments for Transit User Diversion Present Position: Assistant Professor, Université Laval, Polytechnique Montréal - Civil Engineering
2017/8 - 2018/6 Co-Supervisor	Fallah-Shorhani, Masoud (Completed) , McGill University Thesis/Project Title: Calculating daily pollution emissions exposure with smartphone data Present Position: Senior Research Associate, University of Southern California, University of Southern California

Research Associate [n=4]

2019/5 - 2020/8 Principal Supervisor	Dillan Cools (Completed) , Concordia University Thesis/Project Title: Google Location History and Activity Space Stabilization. Present Position: Master's of Urban Planning Student (McGill University), Concordia University - Department of Geography
2017/2 - 2017/7 Principal Supervisor	Stephane Lavoie (Completed) , Concordia University Thesis/Project Title: Design of Documentation for Itinerum Platform. Present Position: Freelance documentary filmmaker, writer and designer, University of British Columbia
2017/2 - 2017/7 Principal Supervisor	Hannah Materne (Completed) , Concordia University Thesis/Project Title: Design of Documentation for Itinerum Platform. Present Position: Freelance Graphic Designer, Self-employed
2015/11 - 2022/5 Principal Supervisor	Kyle Fitzsimmons, Concordia University Thesis/Project Title: Research development Present Position: Research Frontend and Smart Contracts Developer, DFX Finance, Concordia University

Event Administration

2020/6 - 2020/6	Organizer, The Economy of Cities: Urban planning and transportation, Seminar, 2020/6 - 2020/6
2020/1 - 2020/1	Co-organizer, Travel Behaviour and Safety Studies from the Psychological / Neurophysiological Perspective: Application of Virtual Reality, Workshop, 2020/1 - 2020/1
2019/1 - 2019/1	Co-organizer, Hands-on Workshop for VR in Stated Response Research, Workshop, 2019/1 - 2019/1
2019/1 - 2019/1	Organizer, Beyond Disciplines: Cities, Workshop, 2019/1 - 2019/1
2018/1 - 2018/1	Co-organizer, Workshop on Virtual and Augmented Reality for Travel Behavior Analysis, Workshop, 2018/1 - 2018/1
2015/3 - 2017/1	Organizer, TRB Workshop on the Use of Visualization in Stated Preference Surveys, Workshop, 2017/1 - 2017/1

Editorial Activities

2018/1 - 2024/1	Reviewer, Transportation, Journal
2023/1 - 2023/12	Reviewer, Transportation Planning and Technology, Journal
2023/1 - 2023/12	Reviewer, Travel Behaviour and Society, Journal
2021/1 - 2023/12	Reviewer, IEEE Intelligent Transportation Systems Transactions, Journal
2015/1 - 2023/12	Reviewer, Transportation Research: Part A, Journal
2010/9 - 2023/6	Reviewer, Transportation Research Record, Journal
2022/1 - 2022/12	Reviewer, Geospatial Information Science, Journal
2022/1 - 2022/12	Reviewer, Journal of Advanced Transportation, Journal
2022/1 - 2022/12	Reviewer, Journal of Environmental Economics and Policy, Journal
2022/1 - 2022/12	Reviewer, Environment and Planning B: Planning and Design, Journal
2020/1 - 2022/12	Reviewer, Journal of Planning Education Research, Journal
2021/8 - 2021/12	Reviewer, Transportation Research Part C: Emerging Technologies, Journal
2019/1 - 2021/12	Reviewer, Urban Studies, Journal
2020/1 - 2020/12	Reviewer, Computers Environment and Urban Systems, Journal
2017/1 - 2020/12	Reviewer, Journal of Geographical Systems, Journal
2019/1 - 2019/12	Reviewer, Journal of Environmental Economics and Management, Journal
2019/1 - 2019/12	Reviewer, Landscape and Urban Planning, Journal
2018/1 - 2018/12	Reviewer, PlosOne, Journal
2018/1 - 2018/12	Reviewer, Sensors, Journal
2017/1 - 2017/12	Reviewer, International Journal of GIS, Journal

Knowledge and Technology Translation

2021/5 - 2023/6 Principal Investigator, R&D Collaboration with Industry
 Group/Organization/Business Serviced: Transports Québec
 Target Stakeholder: Government Personnel
 Outcome / Deliverable: Development of multimodal accessibility transportation indicators for transportation planning purposes.
 Evidence of Uptake/Impact: Report and knowledge transfer presentation to wide group of representatives of Transports Québec.

International Collaboration Activities

2021/1 - 2021/12 Research Collaborator, United States of America
 Development of research needs statements with professors at Central Florida University, University of Virginia and University of Tennessee

2016/1 - 2018/1 Research Collaborator, United States of America
 With Ricardo Daziano (and Owen Waygood of Laval), work on representational mode in Discrete Choice Experiments on respondent willingness to pay estimates for GHG reductions

2016/5 - 2017/2 Research Collaborator, United States of America
 PI of grant application submitted to the Transatlantic Partnership "Digging into Data Challenge" with Catherine Lawson (and others) of University at Albany

2016/5 - 2017/2 Research Collaborator, United Kingdom
 PI of grant application submitted to the Transatlantic Partnership "Digging into Data Challenge" with Aruna Sivakumar (and others) of Imperial College London

Committee Memberships

2022/4 - 2026/3 Chair, TRB Standing Committee on Travel Survey Methods (AEP25), Transportation Research Board of the United States

2020/4 - 2024/4 Committee Member, Transportation Research Board Urban Data Committee (AED20), US Transportation Research Board

2021/6 - 2023/12 Co-chair, Big Urban Data subcommittee AED20(2), US Transportation Research Board

2018/1 - 2023/12 Co-chair, Stated Response Subcommittee of Travel Survey Methods Committee, US Transportation Research Board

2016/6 - 2023/4 Committee Member, TRB Standing Committee on Travel Survey Methods (ABJ40), Transportation Research Board

2014/1 - 2019/5 Committee Member, Scientific Committee of the Chaire Mobilité, École Polytechnique de Montréal

Other Memberships

2010/5 Regular Member, Centre interuniversitaire de recherche sur les réseaux d'entreprise, la logistique et le transport

Presentations

1. Zachary Patterson, Mehdi Meshkani, Siavash Farazmand & Zachary Patterson. (2024). Innovative On-Demand Transit for First-Mile Trips: A Cutting-Edge Approach. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
2. (2024). Revolutionary Instrument or Another Tool in the Toolbox?. Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
3. Long Pan, EOD Waygood, and Zachary Patterson. (2023). Public Transit Itinerary Choice Analysis Considering Various Incentives. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
4. Hamed Naseri, Owen Waygood, Zachary Patterson & Bobin Wang. (2023). Who Is More Likely to Buy Electric Vehicles?. World Conference on Transportation Research, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No
5. Hamed Naseri, EOD Waygood, Bobin Wang and Zachary Patterson. (2023). An Interpretable Machine Learning Approach to Predict Who Will Buy Electric Vehicles. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
6. Hamed Naseri, Owen Waygood, Zachary Patterson, Meredith Alousi-Jones, Bobin Wang. (2023). Travel Mode Choice Prediction: Developing New Techniques to Prioritize Variables and Interpret Black-box Machine Learning Techniques. World Conference on Transportation Research, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No
7. (2023). Développement d'indicateurs d'accessibilité pour la production d'analyses multimodales et non comparatives - Projet R860.1. Activité de transfert de connaissance, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
8. Ashkan Amirnia, Long Pan, EOD Waygood, Zachary Patterson and Nizar Bouguila. (2023). Personalized Bus Recommender System Approach For Flattening Demand. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
9. Mohamed Chaaben, Asiye Baghbani, Nizar Bouguila and Zachary Patterson. (2023). Short-Term Bus Passenger Flow Prediction Using Multi-Component Graph Attention Neural Network Model. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
10. Zachary Patterson, E.O.D. Waygood and Long Pan. (2023). How Bus Crowding Information Affects Bus Transit User Itinerary Choice. World Conference on Transport Research, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No

11. Hamed Naseri, Owen Waygood, Zachary Patterson, Meredith Alousi-Jones & Bobin Wang. (2023). Travel Mode Choice Prediction: Developing New Techniques to Prioritize Variables and Interpret Black-box Machine Learning Techniques. World Conference on Transport Research, Montreal, Canada
Main Audience: Researcher
Invited?: No, Keynote?: No
12. Asiye Baghbani, Saeed Rahmani, Nizar Bouguila and Zachary Patterson. (2023). Multi-step Short-term Passenger Flow Prediction In Bus Networks Using Graph-based Deep Learning Model. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
13. Hamed Naseri, EOD Waygood, Bobin Wang and Zachary Patterson. (2023). Application of Machine Learning to Child Mode Choice with a Novel Technique to Optimize Hyperparameters. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Main Audience: Researcher
Invited?: No, Keynote?: No
14. Zachary Patterson and Ben Azoulay. (2023). Towards Standardization of Reporting in Smartphone Travel Surveys. The 12th International Conference on Transport Survey Methods, Porto Novo, Portugal
Main Audience: Researcher
Invited?: No, Keynote?: No
15. Zachary Patterson, Bobin Wang, E.O.D. Waygood, Ricardo Daziano, Marketta Braun Kohlova. (2022). Consistency Analysis of Survey Data. The 12th International Conference on Transport Survey Methods, Porto Novo, Portugal
Main Audience: Researcher
Invited?: No, Keynote?: No
16. Long Pan, E.O.D Waygood and Zachary Patterson. (2022). Public transit itinerary choice analysis considering various incentives. Conference of the International Association of Travel Behaviour Research, Santiago, Chile
Main Audience: Researcher
Invited?: No, Keynote?: No
17. Hamed Naseri, E.O.D Waygood, Bobin Wang and Zachary Patterson. (2022). An Interpretable Machine Learning Approach to Predict Who Will Buy Electric Vehicles. Conference of the International Association of Travel Behaviour Research, Santiago, Chile
Main Audience: Researcher
Invited?: No, Keynote?: No
18. (2021). Smart Cities - A solution for infrastructure longevity?. MTL Connect, Online, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No
19. (2020). Une appli peut-elle sauver les villes ?. MTL Connecte (Le Monde), Montreal, Canada
Main Audience: General Public
Invited?: Yes, Keynote?: No
20. (2020). The Walrus Leadership Roundtable: Building the Next-Generation City. The Walrus Leadership Roundtable, Online, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
21. (2019). Applications smartphone pour le recueil de données de mobilité. Journées d'études sur la mobilité urbaine, Paris, France
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No

Broadcast Interviews

2017/10/03 - 2017/10/03	MTL Trajet, Global News Morning, Global Television
2016/02/05 - 2016/09/01	Mapping Bus Routes with Smartphones in Africa, RadioCanada International, RadioCanada International
2014/10/24 - 2015/10/24	Seniors and Suburbanization, Radio Canada International (French), Radio Canada International (French)
2014/10/14 - 2015/10/14	Suburbanization of Seniors, Radio Canada International (English), Radio Canada International
2014/11/01 - 2014/11/01	Suburbanization of Seniors, Des aînés et des droits, CIBL (Montreal), CHOQ-FM (Toronto)
2014/10/17 - 2014/10/17	Suburbanization of Seniors, The Aaron Rand Show, CJAD (Montreal)
2014/10/15 - 2014/10/15	Suburbanization of Seniors, CBC Montreal - Radio Noon, CBC Radio

Publications

Journal Articles

1. Long Pan, EOD Waygood & Zachary Patterson. (2024). How Bus Crowding Information Affects Bus Transit User Itinerary Choice. *Cast Studies on Transport Policy*.
Accepted
Refereed?: Yes, Open Access?: No
2. Mehdi Meshkani, Siavash Farazmand, Nizar Bouguila & Zachary Patterson. (2024). Innovative On-Demand Transit for First-Mile Trips: A Cutting-Edge Approach. *Transportation Research Record*.
Accepted
Refereed?: Yes, Open Access?: No
3. Hamed Naseri, Owen Waygood, Zachary Patterson & Bobin Wang. (2024). Who Is More Likely to Buy Electric Vehicles?. *Transport Policy*.
Submitted
Refereed?: Yes, Open Access?: No
4. Hamed Naseri, Owen Waygood, Zachary Patterson, Meredith Alousi-Jones & Bobin Wang. (2024). Travel Mode Choice Prediction: Developing New Techniques to Prioritize Variables and Interpret Black-box Machine Learning Techniques. *Transportation Planning and Technology*.
Submitted
Refereed?: Yes, Open Access?: No
5. Sneha Paul, Zachary Patterson & Nizar Bouguila. (2024). FishSegSSL: A Semi-supervised Semantic Segmentation Framework for Fish-eye Images. *Journal of Imaging*.
Submitted
Refereed?: Yes, Open Access?: Yes
6. Bobin Wang, E.O.D. Xun Ji, Hamed Naseri, Alex L. Loiselle, Ricardo A. Daziano, Zachary Patterson, and Matthew Feinberg. (2023). How to Effectively Communicate about Greenhouse Gas Emissions with Different Populations. *Environmental Science & Policy*. 147(September): 29-43.
Published
Refereed?: Yes

7. Sneha Paul, Zachary Patterson & Nizar Bouguila. (2023). DualMLP: A Two-stream Fusion Model for 3D Point Cloud Classification. The Visual Computer Journal: <https://doi.org/10.1007/s00371-023-03114-3>.
Published
Refereed?: Yes, Open Access?: No
8. Hamed Naseri,* EOD Waygood, Bobin Wang and Zachary Patterson. (2023). An Interpretable Machine Learning Approach to Predict Who Will Buy Electric Vehicles. Transportation Research Record.
Published
Refereed?: Yes
9. Saeed Rahmani, Nizar Bouguila and Zachary Patterson. (2023). Graph Neural Networks for Intelligent Transportation Systems: A Survey. IEEE Transactions for Intelligent Transportation Systems.
Published
Refereed?: Yes
10. Long Pan, EOD Waygood, and Zachary Patterson. (2023). Public Transit Itinerary Choice Analysis Considering Various Incentives. Transportation Research Record. 2677(11)
Published
Refereed?: Yes
11. Zachary Patterson, Aaron Bensmihen, Gavin Hermanson. (2023). The Multimodal Accessibility Target. Transportation Research Record. 2678(1)
Published
Refereed?: Yes, Open Access?: Yes
12. Bobin Wang, Xun Ji, E.O.D. Waygood, Hamed Naseri, Alex Latulipe Loiselle, Zachary Patterson, Matthew Feinberg. (2023). Exploring the Effects of New Framing Techniques for Greenhouse Gas Emissions. Journal of Cleaner Production.
Revision Requested
Refereed?: Yes
13. Hamed Naseri, EOD Waygood, Bobin Wang and Zachary Patterson. (2022). Application of Machine Learning to Child Mode Choice with a Novel Technique to Optimize Hyperparameters. International Journal of Environmental Research and Public Health. 19(4)
Published
Refereed?: Yes
14. Pierre Laffont; E.O.D. Waygood; Zachary Patterson. (2022). How Many EVs Are Needed To Reach CO2 Emissions Goals? A Case Study from Montreal, Canada. Sustainability. 14(3)
Published
Refereed?: Yes
15. Godwin Badu-Marfo, Bilal Farooq and Zachary Patterson. (2022). Composite Travel Generative Adversarial Networks for Tabular and Sequential Population Synthesis. IEEE Transactions on Intelligent Transportation Systems. 23(10)
Published
Refereed?: Yes
16. Ali Baghdadi, Narges Manouchehri, Zachary Patterson, Wentao Fan, and Nizar Bouguila. (2022). Hierarchical Dirichlet and Pitman-Yor process mixtures of shifted scaled dirichlet distributions for proportional data modelling. Computational Intelligence. 38: 2095-2115.
Published
Refereed?: Yes
17. Asiye Baghbani, Nizar Bouguila, Zachary Patterson. (2022). Short-Term Passenger Flow Prediction Using a Bus Network Graph Convolutional LSTM Neural Network Model. Transportation Research Record. 2677(2)
Published
Refereed?: Yes, Open Access?: No

18. Bochu Liu, Michael J. Widener, Lindsey G. Smith, Steven Farber, Dionne Gesink, Leia M. Minaker, Zachary Patterson, Kristian Larsen, and Jason Gilliland. (2022). Time-Geographic Project of Household Food Provision: Conceptualization and a Pilot Case Study. *Annals of the American Association of Geographers*. Published
Refereed?: Yes
19. Hamed Naseri; E.O.D. Waygood; Bobin Wang; Zachary Patterson; Ricardo Daziano. (2022). A Novel Feature Selection Technique to Better Predict Climate Change Stage of Change. *Sustainability*. 14(40)
Published
Refereed?: Yes
20. Godwin Badu-Marfo, Bilal Farooq, Zachary Patterson. (2022). Differentially Private Multi-Output Deep Generative Networks for Population Mobility Data Synthesis. *Transportation Research Part A: Policy and Practice*.
Revision Requested
Refereed?: Yes, Open Access?: No
21. Bochu Liu, Michael J. Widener, Lindsey G. Smith, Steven Farber, Dionne Gesink, Leia M. Minaker, Zachary Patterson, Kristian Larsen, and Jason Gilliland. (2022). Who's cooking tonight? a time-use study of coupled adults in Toronto, Canada. *Time & Society*. 33(4): 480--507.
Published
Refereed?: Yes, Open Access?: Yes
22. Long Pan, E.O.D. Waygood, Zachary Patterson. (2022). Would You Wait? Bus Choice Behavior Analysis Considering Various Incentives. *Transportation Research Record*. 2676(7)
Published
Refereed?: Yes, Open Access?: No
23. Dillan Cools, Scott Christian McCallum, Daniel Rainham, Nathan Taylor, and Zachary Patterson. (2021). Understanding Google Location History as a tool for travel diary data acquisition. *Transportation Research Record*. 2675(1)
Published
Refereed?: Yes, Open Access?: No
24. Bochu Liu, Michael J. Widener, Lindsey G. Smith, Steven Farber, Leia M. Minaker, Zachary Patterson, Kristian Larsen, Jason Gilliland. (2021). Disentangling Time Use, Food Environment, and Food Behaviors Using Multi-Channel Sequence Analysis. *Geographical Analysis*. 54(4): 881-917.
Published
Refereed?: Yes, Open Access?: Yes
25. Ali Yazdizadeh, Zachary Patterson & Bilal Farooq. (2021). Semi-supervised GANs to Infer Travel Modes in GPS Trajectories. *Journal of Big Data Analytics in Transportation*. (July)
Published
Refereed?: Yes, Open Access?: No
26. Ravi Teja Vemuri, Muhammad Azam, Nizar Bouguila & Zachary Patterson. (2021). A Bayesian sampling framework for asymmetric generalized Gaussian mixture models learning. *Neural Computing and Applications*.
Published
Refereed?: Yes, Open Access?: No
27. E. O. D. Waygood, Bobin Wang, Ricardo A. Daziano, Zachary Patterson & Markéta Braun Kohlová. (2021). The climate change stage of change measure: vehicle choice experiment. *Journal of Environmental Planning and Management*.
Published
Refereed?: Yes, Open Access?: Yes

28. Ali Yazdizadeh, Arash Kalatian, Zachary Patterson, Bilal Farooq. (2021). Multi-task Recurrent Neural Networks to Simultaneously Infer Mode and Purpose in GPS Trajectories. Transportation. Submitted
Refereed?: Yes, Open Access?: No
29. BobinWang, E.O.D.Waygood, Ricardo A. Daziano, Zachary Patterson, Matthew Feinberg. (2021). Does Hedonic Framing Improve People's Willingness-To-Pay for Vehicle Greenhouse Gas Emissions?. Transportation Research Part D. 98(September)
Published
Refereed?: Yes, Open Access?: Yes
30. Lindsey G Smith, Michael J Widener, Bochu Liu, Steven Farber, Leia Minaker, Zachary Patterson, Kristian Larsen and Jason Gilliland. (2021). Comparing household and individual measures of access through a food environment lens: what household food opportunities are missed when measuring access to food retail at the individual level. Annals of the American Association of Geographers.
Published
Refereed?: Yes, Open Access?: No
31. Ben Azoulay, Zachary Patterson. (2021). Towards the Standardization of Reporting in Smartphone Travel Surveys: The Development and Application of the Smartphone Survey Reporting Guidelines (SSRGs). Transportation Research Procedia from the 12th International Conference on Transport Survey Methods.
Accepted
Refereed?: Yes, Open Access?: No
32. R.Daziano, E.O.D.Waygood, Z.Patterson, M.Feinberg, B.Wang. (2020). Reframing greenhouse gas emissions information presentation on the Environmental Protection Agency's new-vehicle labels to increase willingness to pay. Journal of Cleaner Production. 279(10 January)
Published
Refereed?: Yes, Open Access?: No
33. Ali Yazdizadeh, Zachary Patterson & Bilal Farooq. (2020). Ensemble Convolutional Neural Networks for Mode Inference in Smartphone Travel Survey. IEEE Transactions on Intelligent Transportation Systems. 21(6)
Published
Refereed?: Yes, Open Access?: No
34. Godwin Badu-Marfo, Bilal Farooq & Zachary Patterson. (2019). Perturbation Methods for Protection of Sensitive Location Data: Smartphone Travel Survey Case Study. Transportation Research Record. 2673(12)
Published
Refereed?: Yes, Open Access?: No
35. Ali Yazdizadeh, Zachary Patterson, Bilal Farooq. (2019). An automated approach from GPS traces to complete trip information. International Journal of Transportation Science and Technology. 8(1): 82-100.
Published
Refereed?: Yes, Open Access?: Yes
36. Zachary Patterson, Kyle Fitzsimmons, Stewart Jackson, Takeshi Mukai. (2019). Itinerum: The open smartphone travel survey platform. SoftwareX. 10(Jul-Dec)
Published
Refereed?: Yes, Open Access?: Yes
37. Godwin Badu-Marfo, Bilal Farooq, Zachary Patterson. (2019). A Perspective on the Challenges and Opportunities for Privacy-Aware Big Transportation Data. Journal of Big Data Analytics in Transportation. (1): 1-23.
Published
Refereed?: Yes, Open Access?: No

38. Masoud Fallah-Shorshani, Marianne Hatzopoulou, Nancy A. Ross, Zachary Patterson, Scott Weichenthal. (2018). Evaluating the Impact of Neighborhood Characteristics on Differences between Residential and Mobility-Based Exposures to Outdoor Air Pollution. *Environmental Science & Technology*. 52(18): 10777–10786.
Published
Refereed?: Yes, Open Access?: No
39. Ali Rezaei and Zachary Patterson. (2018). Preference Stability in Household Location Choice: Accounting for the Evolution of Choice Behavior in Montreal across Three Censuses. *Research in Transportation Economics*. 67(May): 44-53.
Published
Refereed?: Yes, Open Access?: No
40. Michael J Widener, Leia M Minaker, Jessica L Reid, Zachary Patterson, Tara Kamal Ahmadi, David Hammond. (2018). Activity space-based measures of the food environment and their relationships to food purchasing behaviours for young urban adults in Canada. *Public Health Nutrition*. 21(11)
Published
Refereed?: Yes, Open Access?: Yes

Book Chapters

1. Ravi Vemuri, Narges Manouchehri, Zachary Patterson, and Nizar Bouguila. (2021). Bayesian Inference of Hidden Markov Models using Dirichlet Mixtures. Nizar Bouguila, W. Fan, and M. Amayri. *Hidden Markov Models and Applications*. : 157–176.
Published, Springer
Refereed?: Yes
2. Ali Baghdadi, Narges Manouchehri, Zachary Patterson and Nizar Bouguila. (2021). Shifted-Scaled-Dirichlet Based Hierarchical Dirichlet Process Hidden Markov Models with Variational Inference Learning. Nizar Bouguila; W. Fan; M. Amayri. *Hidden Markov Models and Applications*. : 263–292.
Published, Springer
Refereed?: Yes

Reports

1. Gavin Hermanson, Pierre Laffont and Zachary Patterson. (2023). Rapport final : Développement d'indicateurs d'accessibilité pour la production d'analyses multimodales et non comparatives R860.1. 77. Transports Québec.
2. Gavin Hermanson, Pierre Laffont, Zachary Patterson. (2021). Rapport d'étape : Développement d'indicateurs d'accessibilité pour la production d'analyses multimodales et non comparatives R860.1. 26. Transports Quebec.
3. Bobin Wang, Owen Waygood, Zachary Patterson. (2021). Micro Transit Demand Management (microTDM) with Big Data and Artificial Intelligence. 23. BusPas Inc.

Conference Publications

1. Sneha Paul, Zachary Patterson & Nizar Bouguila. (2024). Semi-supervised Semantic Segmentation on Vehicle-Mounted Fish-eye Camera Images. 103rd Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2024/1
Poster
Published
Refereed?: Yes, Invited?: No

2. Asiye Baghbani, Saeed Rahmani, Nizar Bouguila and Zachary Patterson. (2023). Predicting Passenger Flow Using Graph Neural Networks with Scheduled Sampling on Bus Networks. 2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC), Bilbao, Spain
Conference Date: 2023/9
Paper
Accepted
Refereed?: Yes, Invited?: No
3. Mohamed Chaaben, Asiye Baghbani, Nizar Bouguila and Zachary Patterson. (2023). Multi-STGAC: A Graph Attention Based Model for Short-term Bus Passenger Flow Forecasting. 2023 IEEE 26th International Conference on Intelligent Transportation Systems (ITSC), Bilbao, Spain
Conference Date: 2023/9
Paper
Accepted
Refereed?: Yes, Invited?: No
4. Long Pan, E.O.D. Waygood, Zachary Patterson. (2023). How Bus Crowding Information Affects Bus Transit User Itinerary Choice. World Conference on Travel Research, Montreal, Canada
Conference Date: 2023/7
Paper
Accepted
Refereed?: Yes, Invited?: No
5. Naghmeh Shafiee Roudbari, Zachary Patterson, Ursula Eicker and Charalambos Poullis. (2022). Simpler is better: Multilevel Abstraction with Graph Convolutional Recurrent Neural Network Cells for Traffic Prediction. IEEE SSCI 2022 proceedings. IEEE Symposium Series On Computational Intelligence (ICIT22), Singapore, Singapore
Conference Date: 2022/12
Paper
Published
Refereed?: Yes, Invited?: No
6. Ravi Teja Vemuri, Muhammad Azam, Nizar Bouguila and Zachary Patterson. (2022). Bayesian Model and Feature Selection in Asymmetric Generalized Gaussian Mixtures. 2022 IEEE International Conference on Industrial Technology (ICIT), Shanghai (fully online), China
Conference Date: 2022/8
Paper
Published
Refereed?: Yes, Invited?: No
7. Sneha Paul, Zachary Patterson and Nizar Bouguila. (2022). Improved Training for 3D Point Cloud Classification. Structural, Syntactic, and Statistical Pattern Recognition. S+SSPR 2022 - IAPR Joint International Workshops on Statistical Techniques in Pattern Recognition (SPR 2022) and Structural and Syntactic Pattern Recognition (SSPR 2022), Montreal, Canada
Conference Date: 2022/8
Paper
Published
Refereed?: Yes, Invited?: No
8. Gavin Hermanson, Zachary Patterson. (2022). Multimodal Accessibility to Employment and Equity: A Case Study of the Pie-IX Bus Rapid Transit in Montreal, Canada. Proceedings of the 101st Annual Meeting of the Transportation Research Board. 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Accepted
Refereed?: Yes, Invited?: No

9. Hamed Naseri, Owen Waygood, Bogin Wang, Zachary Patterson. (2022). How to predict Climate Change Stage of Change Accurately: Proposing A New Feature Selection Technique. Proceedings of the 101st Annual Meeting of the Transportation Research Board. Proceedings of the 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Accepted
Refereed?: Yes, Invited?: No
10. Bobin Wang, Xun Ji, E.O.D. Waygood, Hamed Naseri, Alex Latulipe Loiselle, Zachary Patterson, Matthew Feinberg. (2022). Exploring the Effects of New Framing Techniques for Greenhouse Gas Emissions. Proceedings of the 101st Annual Meeting of the Transportation Research Board. Proceedings of the 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Published
Refereed?: Yes, Invited?: No
11. Aaron Bensmihen, Zachary Patterson. (2022). The Multimodal Accessibility Indicator (MAI) across the United States. Proceedings of the 101st Annual Meeting of the Transportation Research Board. 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Accepted
Refereed?: Yes, Invited?: No
12. Asiye Baghbani, Nizar Bouguila, Zachary Patterson. (2022). Short-Term Passenger Flow Prediction Using a Bus Network Graph Convolutional LSTM Neural Network Model. Proceedings of the 101st Annual Meeting of the Transportation Research Board. 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Accepted
Refereed?: Yes, Invited?: No
13. Long Pan, E.O.D. Waygood, Zachary Patterson. (2022). Would You Wait? Bus Choice Behavior Analysis Considering Various Incentives. 101st Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2022/1
Paper
Accepted
Refereed?: Yes, Invited?: No
14. Zachary Patterson, Aaron Bensmihen, Gavin Hermanson. (2021). The Multimodal Accessibility Target (MAT). Proceedings of the 2021 World Symposium on Transportation and Land Use Research. 2021 World Symposium on Transportation and Land Use Research, Washington, United States of America
Conference Date: 2021/8
Paper
Published
Refereed?: Yes, Invited?: No

15. Godwin Badu-Marfo, Bilal Farooq, Zachary Patterson. (2021). Privacy versus Accuracy in Activity Diary Synthesis: A Differentially Private Multi-Output Deep Generative Networks Approach. Proceedings of the 100th Annual Meeting of the Transportation Research Board. 100th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2021/1
Paper
Published
Refereed?: Yes, Invited?: No
16. Zachary Patterson, Aaron Bensmihen, Gavin Hermanson. (2021). The Multimodal Accessibility Benchmark (MAB) in Transportation Planning. Proceedings of the 100th Annual Meeting of the Transportation Research Board. 100th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2021/1
Paper
Published
Refereed?: Yes, Invited?: No
17. Ben Azoulay, Zachary Patterson. (2021). Towards the Standardization of Reporting in Smartphone Travel Surveys: The Smartphone Survey Reporting Guidelines (SSRG). Proceedings of the 100th Annual Meeting of the Transportation Research Board. 100th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2021/1
Paper
Published
Refereed?: Yes, Invited?: No
18. Bobin Wang, Owen Waygood, Ricardo Daziano, Zachary Patterson. (2021). Willingness-To-Pay for Transport Emissions by Region and Climate Change-Stage of Change: A Vehicle Choice Experiment with Framing. Proceedings of the 100th Annual Meeting of the Transportation Research Board. 100th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2021/1
Paper
Published
Refereed?: Yes, Invited?: No
19. Scott McCallum, Zachary Patterson. (2021). Google Location History Data and its Potential for Activity Space Research. Proceedings of the 100th Annual Meeting of the Transportation Research Board. 100th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2021/1
Paper
Published
Refereed?: Yes, Invited?: No
20. Ricardo Daziano, E. Owen Waygood, Zachary Patterson, Matthew Feinberg, Bobin Wang. (2020). Framing greenhouse gas emissions on the environmental protection agency's new vehicle labels to increase willingness to pay. Proceedings of the 99th Annual Meeting of the Transportation Research Board. 99th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2020/1
Paper
Published
Refereed?: Yes, Invited?: No

21. Dillan Cools, Scott McCallum, Daniel Rainham, Nathan Taylor, Zachary Patterson. (2020). Understanding Google Location History as a tool for travel diary data acquisition. Proceedings of the 99th Annual Meeting of the Transportation Research Board. 99th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2020/1
Paper
Published
Refereed?: Yes, Invited?: No
22. David Lopez, Ali Yazdizadeh, Bilal Farooq, Zachary Patterson. (2020). A distributed framework for privacy aware mode interference. Proceedings of the 99th Annual Meeting of the Transportation Research Board. 99th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2020/1
Paper
Published
Refereed?: Yes, Invited?: No
23. Ben Azoulay, Barrett Hedges, and Zachary Patterson. (2020). Toward a quantitative methodology for evaluating the distribution of space in complete streets. Proceedings of the 99th Annual Meeting of the Transportation Research Board. 99th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2020/1
Paper
Published
Refereed?: Yes, Invited?: No
24. E. Owen Waygood, Bobin Wang, Ricardo Daziano, Zachary Patterson, Marketa Braun Kohlova. (2020). Vehicle choice and CO2 emissions information: Framing effects and individual climate change stage of change. Proceedings of the 99th Annual Meeting of the Transportation Research Board. 99th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2020/1
Paper
Published
Refereed?: Yes, Invited?: No
25. Owen Waygood, Ricardo Daziano, Matthew Feinberg, Zachary Patterson, Bobin Wang. (2019). How will Information Framing Influence Individual's Willingness-to-Pay for CO2 Emissions Reductions. Proceedings of the 6th International Choice Modelling Conference. 6th International Choice Modelling Conference, Kobe, Japan
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
26. Godwin Badu-Marfo, Bilal Farooq, Zachary Patterson. (2019). Privacy preserved generative learning approach for open behavioural data. Proceedings of the 6th International Choice Modelling Conference. 6th International Choice Modelling Conference, Kobe, Japan
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No

27. Marshall Davey, Ali Yazdizadeh, and Zachary Patterson. (2019). Transit network complexity in the context of transit itinerary inference using smartphone travel survey data. Proceedings of the 98th Annual Meeting of the Transportation Research Board. 98th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2019/1
Paper
Published
Refereed?: Yes, Invited?: No
28. Parham Hamouni, Ciprian Alecsandru, Zachary Patterson. (2019). A methodology to incorporate scenicness into revealed preference pedestrian route choice modeling from smartphone data. Proceedings of the 98th Annual Meeting of the Transportation Research Board. 98th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2019/1
Paper
Published
Refereed?: Yes, Invited?: No
29. Godwin Badu-Marfo, Bilal Farooq, Zachary Patterson. (2019). Perturbation privacy for sensitive locations in mobility data publication: A case study of Montreal Trajet surveys. Proceedings of the 98th Annual Meeting of the Transportation Research Board. 98th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2019/1
Paper
Published
Refereed?: Yes, Invited?: No
30. Michael Widener, Leia Minaker, Tara Kamal Ahmadi, Zachary Patterson, Jessica Reid, David Hammond. (2018). Activity space-based measures of the food environment and their relationships to food purchasing behaviors for young urban adults in Canada. Proceedings of the 97th Annual Meeting of the Transportation Research Board. 97th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2018/1
Paper
Published
Refereed?: Yes, Invited?: No
31. Godwin Badu-Marfo, Zachary Patterson, Bilal Farooq. (2018). Challenges and opportunities for privacy aware big transport data: Short-term and long-term outlook. Proceedings of the 97th Annual Meeting of the Transportation Research Board. 97th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2018/1
Paper
Published
Refereed?: Yes, Invited?: No
32. Michael Widener, Leia Minaker, Tara Kamal Ahmadi, Zachary Patterson, Jessica Reid, David Hammond. (2018). Recruitment, burden, incentives and participation in smartphone travel surveys. Proceedings of the 97th Annual Meeting of the Transportation Research Board. 97th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2018/1
Paper
Published
Refereed?: Yes, Invited?: No

33. Mohsen Rezaei, Zachary Patterson, Jia-Yuan Yu, Ali Yazdizadeh. (2018). Semi-supervised learning for mode detection from smartphone data. Proceedings of the 97th Annual Meeting of the Transportation Research Board. 97th Annual Meeting of the Transportation Research Board, Washington, United States of America
Conference Date: 2018/1
Paper
Published
Refereed?: Yes, Invited?: No



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Dr. Andrea Schiffauerova

Correspondence language: English

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Dr. Andrea Schiffauerova

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
Czech	Yes	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes	Yes
German	Yes	No	No	No	No
Russian	Yes	Yes	No	Yes	No
Spanish; Castilian	Yes	Yes	No	Yes	No

Degrees

- 2008/12 Doctorate, Industrial Engineering, École Polytechnique de Montréal
Supervisors: Prof. Catherine Beaudry, 2005/9 - 2008/12
- 2002/12 Master's non-Thesis, Industrial Engineering, École Polytechnique de Montréal
Supervisors: Prof. Daniel Leblanc, 2000/9 -
- 1997/6 Bachelor's, Industrial Engineering, Slezska Univerzita
Supervisors: Prof. Jan Konecny, 1992/9 -

Recognitions

- 2014/12 The CMS President Award for the Best Presentation - 0
Canadian Mathematical Society
Prize / Award
My presentation won the CMS President's Award during Canadian Mathematical Society Winter Meeting, Hamilton, Canada, December 5-8, 2014
- 2008/4 Best Presentation Prize - 0
CIRST (Interuniversity Research Center on Science and Technology)
Prize / Award
My presentation won the Best Presentation Prize during the Conference on research in science and technology, CIRST, Montreal, Canada, April 2008

User Profile

Research Specialization Keywords: biotechnology, collaborative ecosystems, innovation network, modeling & simulation, nanotechnology, open innovation, R&D management, scientometrics, social network analysis

Employment

2014/5	Associate Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Associate Professor Tenure Status: Tenure
2009/8 - 2014/4	Assistant Professor Concordia Institute for Information Systems Engineering, Concordia University Full-time, Assistant Professor
2005/9 - 2008/12	Research Assistant Génie industriel, École Polytechnique de Montréal
2003/1 - 2005/8	Researcher Mechanical Engineering, McGill University
1997/1 - 1997/6	Industrial Intern Economic department, Nova Hut Steelworks

Research Funding History

Awarded [n=11]

2018/5 - 2024/4 Co-investigator	Partnership for the Organization of Innovation and New Technologies, Grant Funding Sources: Social Sciences and Humanities Research Council of Canada (SSHRC) Partnership Grant Total Funding - 2,499,723 Portion of Funding Received - 100,000 Funding Competitive?: Yes
2022/11 - 2024/3 Principal Investigator	Framework for the transformation of health-related technology to the clinical setting: The role of critical actors in healthcare ecosystem, Grant Funding Sources: Fonds de recherche du Québec - Santé (FRQS) TransMedTech Innovateurs(rices) en résidence Total Funding - 37,500 Portion of Funding Received - 37,500 Funding Competitive?: Yes
2018/9 - 2023/8 Principal Investigator	Partnership for the Organization of Innovation and New Technologies, Grant Funding Sources: Concordia University Positioning in Multi-Institutional Research Organization Total Funding - 30,000 Portion of Funding Received - 30,000 Funding Competitive?: Yes
2019/5 - 2023/4 Co-investigator	Surfer sur la vague, ou subir la raz de marée? Organiser et comprendre les écosystèmes d'innovation a l'aide de nouvelles données, Grant Funding Sources: Fonds Québécois de la Recherche sur la Société et la Culture (FQRSC) Soutien aux équipes de recherche / Partenariat - renouvellement Total Funding - 603,740

	Portion of Funding Received - 30,000 Funding Competitive?: Yes
2018/4 - 2023/3 Co-investigator	Text mining infrastructure for the Partnership for the Organization of Innovation and New technologies, Grant Funding Sources: Canada Foundation for Innovation (CFI) John R. Evans Leaders Funds Total Funding - 500,000 Portion of Funding Received - 20,000 Funding Competitive?: Yes
2018/1 - 2019/1 Principal Applicant	Impact of collaborative patterns on the commercialization capability of innovations, Grant Funding Sources: Concordia University - Faculty Research Development Program (FRDP) Total Funding - 25,000 Portion of Funding Received - 25,000 Funding Competitive?: Yes
2015/4 - 2017/12 Principal Investigator	Formation and dynamics of the scientific activities in renewable/sustainable energy in the UAE and other GCC countries, Grant Funding Sources: Masdar Institute of Science and Technology Capital Equipment Funding Total Funding - 118,400 Portion of Funding Received - 118,400 Funding Competitive?: Yes
2013/9 - 2017/8 Co-investigator	La commercialisation des nanotechnologies au Canada - Une taxonomie des facteurs y contribuant, Grant Funding Sources: Social Sciences and Humanities Research Council of Canada (SSHRC) Insight Grant Total Funding - 245,000 Portion of Funding Received - 100,000 Funding Competitive?: Yes Principal Investigator : Catherine Beaudry
2015/5 - 2017/4 Principal Investigator	Formation and dynamics of the scientific activities in renewable/sustainable energy in the UAE and other GCC countries, Grant Funding Sources: Masdar Institute of Science and Technology Total Funding - 167,666 Portion of Funding Received - 167,666 Funding Competitive?: Yes
2013/5 - 2017/4 Co-investigator	Programmation sur l'ouverture de l'innovation dans les nouvelles technologies, Grant Funding Sources: Fonds Québécois de la Recherche sur la Société et la Culture (FQRSC) Soutien aux équipes de recherche Total Funding - 416,416 Portion of Funding Received - 40,000 Funding Competitive?: Yes Co-investigator : Laurent Simon; Majlinda Zhegu; Nathalie de Marcellis; Patrick Cohendet;

Principal Investigator : Catherine Beaudry

2015/3 - 2017/2
Principal Investigator Design and improvements of security solutions to be integrated in an Internet gateway,
Grant

Funding Sources:

MITACS

Accelerate Cluster

Total Funding - 323,333

Portion of Funding Received - 72,025

Funding Competitive?: Yes

Co-investigator : Jose M. Fernandes; M. Robert

Completed [n=8]

2011/5 - 2016/4
Principal Investigator Modeling and simulation of cost of quality in supply chains, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery grant

Total Funding - 115,000

Portion of Funding Received - 115,000

Funding Competitive?: Yes

2012/9 - 2014/8
Co-investigator Partenariat pour l'Ouverture de l'Innovation dans les Nouvelles Technologies (POINT),
Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

Subventions de développement de partenariat

Total Funding - 199,950

Portion of Funding Received - 34,000

Funding Competitive?: Yes

Co-investigator : Majlinda Zhegu; Nathalie de Marcellis; Patrick Conhendet;

Principal Investigator : Beaudry, Catherine

2011/5 - 2014/4
Principal Investigator Exploring the gap between academic research and its industrial application in Quebec
nanotechnology, Grant

Funding Sources:

Fonds Québécois de la Recherche sur la Société et la Culture (FQRSC)

Etablissement de nouveaux professeurs-chercheurs

Total Funding - 39,600

Portion of Funding Received - 39,600

Funding Competitive?: Yes

2012/5 - 2014/4
Principal Investigator Study of the evolving structure of scientific and technological domains in Canadian
nanotechnology, Grant

Funding Sources:

Social Sciences and Humanities Research Council of Canada (SSHRC)

Insight Development Grant

Total Funding - 75,000

Portion of Funding Received - 45,000

Funding Competitive?: Yes

Co-investigator : Catherine Beaudry

2012/5 - 2013/4 Novel approach to the evaluation of supply chain performance, Grant

Principal Investigator	Funding Sources: Concordia University Seed Funding Total Funding - 7,000 Portion of Funding Received - 7,000 Funding Competitive?: Yes
2011/5 - 2013/4 Co-investigator	Impact de la recherche subventionnée, des systèmes régionaux d'innovation, des réseaux d'innovation et des flux de connaissance sur l'innovation de haute technologie, Grant Funding Sources: Fonds Québécois de la Recherche sur la Société et la Culture (FQRSC) Soutien aux équipes de recherche Total Funding - 61,600 Portion of Funding Received - 6,500 Funding Competitive?: Yes Co-investigator : Majlinda Zhegu; Patrick Cohendet; Principal Investigator : Catherine Beaudry
2009/9 - 2012/5 Principal Investigator	Innovation networks and information transmission efficiency, Grant Funding Sources: Concordia University Start-up grant Total Funding - 75,000 Portion of Funding Received - 75,000 Funding Competitive?: No
2011/5 - 2012/4 Co-investigator	Impact des subventions publiques sur le développement des nanotechnologies : Une comparaison du Québec, du Canada et des États-Unis, Grant Funding Sources: Réseau de connaissance Ne3LS Total Funding - 25,000 Portion of Funding Received - 10,000 Funding Competitive?: Yes Principal Investigator : Beaudry, Catherine

Student/Postdoctoral Supervision

Master's Thesis [n=29]

Principal Supervisor	Neha Bala Dutt (In Progress) Student Degree Expected Date: 2024/3 Thesis/Project Title: Feasibility and economic study for conducting TAVI procedure in patients using HoloLens
Co-Supervisor	Koosha Shirouyeh (In Progress) Student Degree Expected Date: 2023/5 Thesis/Project Title: Star scientists' prediction in AI scientific ecosystem using machine learning
Co-Supervisor	Shahab Mosallaie (Completed)

Co-Supervisor	Hamid Vosoughi (In Progress) Student Degree Expected Date: 2023/8 Thesis/Project Title: The impact of various funding programs on research outcome and performance
Principal Supervisor	Shirin Tavakoli (In Progress) Student Degree Expected Date: 2025/3
Principal Supervisor	Mohammad Soleymani Far (In Progress) Student Degree Expected Date: 2023/12 Thesis/Project Title: Gender disparity in research funding and scientific productivity
Principal Supervisor	Melika Feyzi (In Progress) Student Degree Expected Date: 2024/3 Thesis/Project Title: The role of critical actors in the science-technology interactions in the clinical context of healthcare innovations
Principal Supervisor	Mahdi Rad (Completed) Thesis/Project Title: Influence of collaboration networks on commercialization in Canadian nanotechnology
Principal Supervisor	Amnah Alzeyoudi (Completed) Thesis/Project Title: The impact of gender and collaboration patterns on research performance of the scientists in the GCC countries
Principal Supervisor	Shaikha Al Alawi (Completed) Thesis/Project Title: Impact of collaboration patterns among industry, academia and government on scientific output
Principal Supervisor	Maryam Yammahi (Completed) Thesis/Project Title: Bibliometric and network analysis of renewable energy research in the GCC countries
Co-Supervisor	Elva Luz Crespo Neira (Completed) Thesis/Project Title: Influence of cognitive, geographical and collaborative proximity in knowledge production of Canadian nanotechnology
Co-Supervisor	Hadi Shahidi Nejad (Completed) Thesis/Project Title: The influences and interactions between various scientific research and technological domains in case of Canadian nanotechnology
Principal Supervisor	Arman Sadreddin (Completed) Thesis/Project Title: The impact of applying open innovation practices on performance of firms in nanotechnology industry
Principal Supervisor	Roya Kalbassi (Completed) Thesis/Project Title: Lean and green parallel implementation impact on outcomes of supply chain in Canadian aerospace industry
Principal Supervisor	Patricia Duarte (Completed) Thesis/Project Title: Quality cost analysis in the service sector: An empirical study of the Colombian banking sector
Principal Supervisor	Ayati Ehsan (Completed) Thesis/Project Title: Developing a model for cost of quality in manufacturing supply chain
Principal Supervisor	Subramanian Narasimhan Venkata (Completed) Thesis/Project Title: Investigating the factors that affect the implementation of Cost of Quality
Principal Supervisor	Wei Wei (Completed) Thesis/Project Title: Development of supply chain performance measurement tool

Principal Supervisor	Zamzami Nuha (Completed) Thesis/Project Title: Evaluating the innovation dynamics through simulation. The case of Canadian high technology industries
Principal Supervisor	Sawan Rema (Completed) Thesis/Project Title: Simulation of cost of quality in the procurement function in the construction industry
Co-Supervisor	Bani Milhim Hamzeh (Completed) Thesis/Project Title: Formulation and formalization of the enterprise innovation process
Principal Supervisor	Moazami Afshin (Completed) Thesis/Project Title: The investigations in the innovation network architecture: The comparison of the nanotechnology innovation networks in Quebec, Canada and United States
Principal Supervisor	Tajaddod Alizadeh Dorsa (Completed) Thesis/Project Title: The study on the dynamics of Canadian biotechnology innovation networks
Principal Supervisor	Eslami Hamidreza (Completed) Thesis/Project Title: The impact of the innovation network architecture on innovative performance
Principal Supervisor	Tayaran Elham (Completed) Thesis/Project Title: Investigation of the critical factors in the early stage of the innovation process in biotechnology: A system dynamics approach
2022/9 Principal Supervisor	Niushin Khamseli (In Progress) Student Degree Expected Date: 2024/10 Thesis/Project Title: Investigating science-technology interactions in the artificial intelligence collaborative ecosystem
2020/5 - 2022/8 Principal Supervisor	Mohammad Mahdi Toobae (Completed) Thesis/Project Title: Understanding geographical patterns of scientific collaboration in the field of artificial intelligence
2020/1 - 2021/12 Co-Supervisor	Anahita Hajibabaei (Completed) Thesis/Project Title: Gender-specific patterns in the artificial intelligence scientific ecosystem

Doctorate [n=9]

Co-Supervisor	Ali Ghaemmaghami (In Progress) Student Degree Expected Date: 2025/4 Thesis/Project Title: Intelligent multi-layer approach for the early detection of emerging science and technology
Principal Supervisor	Mahsa Sadat Noori Najafi (In Progress) Student Degree Expected Date: 2024/11 Thesis/Project Title: Investigation of the critical actors in collaborative ecosystems using simulation and machine learning
Principal Supervisor	Harriet Laryea (In Progress) Student Degree Expected Date: 2024/2 Thesis/Project Title: Maritime autonomous surface ships and energy management
Co-Supervisor	Alglawe Asama (Completed) Thesis/Project Title: Designing Supply Chain Based on Cost of Quality with Consideration of Quality Level

Principal Supervisor	Fahad A. Maghrabie Hesham (Completed) Thesis/Project Title: Addressing uncertainty in the Multi Criteria Decision Analysis
Principal Supervisor	Ghiasi Hafezi Gita (Completed) Thesis/Project Title: Canadian Nanotechnology and Equity Challenges: Implications for Pro-Poor and Gender-Inclusive Policy
Principal Supervisor	Abdulrahman Kassem (Completed) Thesis/Project Title: Evaluation of solar thermal power technologies in developing countries
Principal Supervisor	Ebadi Ashkan (Completed) Thesis/Project Title: Evaluation of the effect of federal funding on scientific outcome and collaboration
Co-Supervisor	Tahmooresnejad Leila (Completed) Thesis/Project Title: Impact of public funding on the development of nanotechnology: A comparison of Quebec, Canada and the US

Presentations

1. Ebadi, A. and Schiffauerova A. (2022). Towards increasing the share of female researchers' funding in science. 16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting, Bangkok, Thailand
2. Noori Najafi, M.*, and Schiffauerova A. (2022). Using simulation to investigate the role of critical actors in collaborative ecosystem. P4IE Conference – Measuring Metrics that Matter, Ottawa, Canada
3. Toobae, M. M.*, Ebadi, A. and Schiffauerova A. (2022). Understanding geographical patterns of scientific collaboration in artificial intelligence among Canadian researchers. IEEE 5th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT), Ankara, Turkey
4. Shirouyeh, K.*, Schiffauerova A. and Ebadi, A. (2022). Star scientists' prediction in the AI scientific ecosystem using machine learning. 16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting, Bangkok, Thailand
5. Shirouyeh, K.*, Ebadi, A. and Schiffauerova A. (2022). Can we predict future star scientists using machine learning?. P4IE Conference – Measuring Metrics that Matter, Ottawa, Canada
6. Ghaemmaghami, A.*, Schiffauerova A. and Ebadi, A. (2022). Using an indicator-based model to detect emerging technologies. The case of AI scientific ecosystem. IEEE 6th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT), Ankara, Turkey
7. Vosoughi, H.*, Schiffauerova A. and Ebadi, A. (2022). Investigating the impact of different research funding programs. 16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting, Bangkok, Thailand
8. Ghaemmaghami, A.*, Schiffauerova A. and Ebadi, A. (2022). Detecting emerging topics in the artificial intelligence scientific ecosystem. P4IE Conference – Measuring Metrics that Matter, Ottawa, Canada
9. Toobae, M. M.*, Ebadi, A. and Schiffauerova A. (2022). Scientific collaboration among AI researchers: Does proximity matter?. P4IE Conference – Measuring Metrics that Matter, Ottawa, Canada
10. Ghaemmaghami, A.*, Schiffauerova A. and Ebadi, A. (2022). Detecting emerging topics in the artificial intelligence scientific ecosystem. 16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting, Bangkok, Thailand
11. Noori Najafi, M.* and Schiffauerova A. (2022). Simulating scientific ecosystem to understand the role of critical actors. 16th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and the 21st COLLNET Meeting, Bangkok, Thailand

12. Mosallaie, S.*, Ebadi, A., and Schiffauerova A. (2021). Interpretable link prediction-based approach for scientific collaboration prediction using machine learning. Policies, Processes and Practices for Performance of Innovation Ecosystems Conference (P4IE), Ottawa, Canada
13. Rad, M.*, Sarencheh, S.*, Schiffauerova A. and Beaudry, C. (2021). Effect of social and personal characteristics of innovators on the economic performance: The study of patent commercialization in Canadian nanotechnology innovation ecosystem. Policies, Processes and Practices for Performance of Innovation Ecosystems Conference (P4IE),, Ottawa, Canada
14. Hajibabaei, A.*, Ebadi, A. and Schiffauerova A. (2021). Identifying driving factors to acquire influential roles within the fast-evolving AI ecosystem. Policies, Processes and Practices for Performance of Innovation Ecosystems Conference (P4IE), Ottawa, Canada
15. Ebadi A., Tremblay S. and Schiffauerova A. (2019). Are female researchers underrepresented in Canadian natural sciences and engineering?. 15th International Conference on Webometrics, Informetrics, and Scientometrics (WIS) and 20th COLLNET Meeting, Dalian, China
16. Schiffauerova, A. and Alzeyoudi, A.*. (2017). Framework for the Assessment of National Systems of Innovation in Biotechnology. ", 19th International Conference on Business and Systems Research, Paris, France

Publications

Journal Articles

1. Hajibabaei, A.*, Schiffauerova, A. and Ebadi, A. (2022). Women and key positions in scientific collaboration networks: Analyzing central scientists' profiles in the artificial intelligence ecosystem through gender lens. *Scientometrics*. : 1-22.
Published
Refereed?: Yes, Open Access?: No
2. Hajibabaei, A.*, Schiffauerova, A. and Ebadi, A.,. (2022). Gender-Specific Patterns in the Artificial Intelligence Scientific Ecosystem. *Journal of Informetrics*. 16(2)
Published
Refereed?: Yes, Open Access?: No
3. Mosallaie, S.*, Rad, M.*, Schiffauerova, A. and Ebadi, A. (2021). Discovering the evolution of artificial intelligence in cancer research using dynamic topic modeling. *Collnet Journal of Scientometrics and Information Management*. 15(2): 225-240.
Published
Refereed?: Yes, Open Access?: No
4. Ghiasi, G.*, Beaudry, C., Larivière, V., St-Pierre, C., Schiffauerova, A. and Harsh, M. (2021). Who profits from the Canadian nanotechnology rewards system? Implications for gender-responsible innovation. *Scientometrics*. 126(9): 7937-7991.
Published
Refereed?: Yes, Open Access?: No
5. Ghiasi, G.*, Harsh, M. and Schiffauerova, A.,. (2020). A cross-dimensional analysis of nanotechnology and equality: Examining gender fairness and pro-poor potential in Canada's R&D landscape. *Journal of Responsible Innovation*. 7(3): 528-552.
Published
Refereed?: Yes, Open Access?: No
6. Ebadi A., Tremblay S., Goutte C. and Schiffauerova A. (2020). Application of machine learning techniques to assess the trends and alignment of the funded research output. *Journal of Informetrics*. 14(2)
Published
Refereed?: Yes, Open Access?: No

7. Alglawe, A.* , Schiffauerova, A. and Kuzgunkaya, O. (2019). Analyzing the Cost of Quality within a Supply Chain Using SystemDynamics Approach. *Total Quality Management & Business Excellence*. 30(15-16): 1630-1653.
Published
Refereed?: Yes, Open Access?: No
8. Maghrabie, H.* , Beauregard, Y and Schiffauerova, A. (2019). Grey-based Multi-Criteria Decision Analysis Approach: AddressingUncertainty at Complex Decision Problems. *Technological Forecasting & Social Change*. 146: 366-379.
Published
Refereed?: Yes, Open Access?: No
9. Alglawe, A.* , Kuzgunkaya, O. and Schiffauerova, A. (2019). Managing Quality Decisions in Supply Chain. *International Journal of Quality and Reliability Management*. 31(1): 34-52.
Published
Refereed?: Yes, Open Access?: No
10. Alglawe, A.* , Schiffauerova, A., Kuzgunkaya, O. and I. Shiboub. (2019). Supply Chain Network Design Based on Cost of Quality and Quality LevelAnalysis. *The Total Quality Management Journal*. 31(3): 467-490.
Published
Refereed?: Yes, Open Access?: No
11. Maghrabie, H.* , Beauregard, Y. and Schiffauerova, A. (2019). Multi-Criteria Decision Making Problems with Unknown Weight Informationunder Uncertain Evaluations. *Computers & Industrial Engineering*. 133: 131-138.
Published
Refereed?: Yes, Open Access?: No
12. Wei, W.* , Low, J.F.* and Schiffauerova, A. (2018). Nobody Wants to BuySour Milk: Supply Chain Performance Measure Matters. *International Journal of Logistics Systems and Management*. 29(1): 62-81.
Published
Refereed?: Yes, Open Access?: No
13. Sawan, R.* , Low, J.F.* and Schiffauerova, A. (2018). Quality cost of material procurement in construction projects: A system dynamics perspective. *Engineering, Construction and Architectural Management*. 25(8): 974-988.
Published
Refereed?: Yes, Open Access?: No
14. Duarte Arenas, P.* , Low, J.F.* and Schiffauerova, A. (2018). Balancing Risk andRevenue: a Study of Quality Cost in Banking Industry. *International Journal of Quality and Reliability Management*. 35(10): 2181-2194.
Published
Refereed?: Yes, Open Access?: No
15. Ghiasi, G.* , Harsh, M. and Schiffauerova, A. (2018). Inequality and collaboration patterns in Canadian nanotechnology:implications for pro-poor and gender inclusive policy. *Scientometrics*. 115(2): 785-815.
Published
Refereed?: Yes, Open Access?: No
16. Tajaddod Alizadeh, D.* and Schiffauerova, A. (2017). Evaluation of Effects of Collaborative Patternson the Efficiency of Scientific Networks Using Simulation. *International Journal of Innovation Management*. 22(4)
Published
Refereed?: Yes, Open Access?: No

17. Zamzami, N.* and Schiffauerova, A. (2017). The Impact of Individual Collaborative Activities on Knowledge Creation and Transmission. *Scientometrics*. 111(3): 1385-1413.
Published
Refereed?: Yes, Open Access?: No

Book Chapters

1. Low, J.F, Al-Yammahi, M.R.D. and Schiffauerova, A. (2017). The Gulf's Region Commitment to a Sustainable Lifestyle: A Bibliometric Study. E. Azar and M.A. Raouf. *Sustainability in the Gulf: Challenges and Opportunities*. : 7-28.
Published, Routledge
Refereed?: Yes



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Correspondence language: English

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Dr. Chun Wang

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	No	No	No	No	No
Mandarin Chinese	Yes	Yes	Yes	Yes	Yes

Degrees

- 2008/2 Doctorate, Computer Engineering, University of Western Ontario
Supervisors: Hamada H. Ghenniwa, 2004/1 - 2008/2
- 2004/1 Master's Thesis, Computer Engineering, University of Western Ontario
Supervisors: Hamada H. Ghenniwa, 2002/1 - 2003/12
- 1990/7 Bachelor's, Information Engineering, Huazhong , University of Science & Technology

User Profile

Research Specialization Keywords: Intelligent Transportation Systems, Sustainable and Socially-Oriented Mobility, Decentralized Optimization, Mechanism Design, Multiagent Systems, Game Theory

Employment

- 2020/6 Professor
Concordia Institute for Information Systems Engineering, Concordia University
Full-time, Professor
Tenure Status: Tenure
- 2013/6 - 2020/5 Associate Professor
Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2008/6 - 2013/6 Assistant Professor
Concordia Institute for Information Systems Engineering, Concordia University
Full-time, Assistant Professor
Tenure Status: Tenure Track
- 1990/7 - 2000/11 Telecommunication Engineer
Telecommunications Services, China National Petroleum Co., Ltd

Research Funding History

Awarded [n=6]

2023/4 - 2028/3 Principal Applicant	<p>Stable Matching Mechanisms for Shared Mobility Systems, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 210,000 Portion of Funding Received - 210,000 Funding Competitive?: Yes</p>
2022/2 - 2024/3 Principal Investigator	<p>A Social Welfare Maximization Matching Framework for Supplemental Nurse Staffing, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 200,000 Portion of Funding Received - 200,000 Funding Competitive?: Yes</p>
2023/5 - 2023/11 Principal Investigator	<p>From meal planning to grocery shopping cart; a smart software platform combining personalized recommendations, grocery shopping, and healthy-eating-behavior building, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 60,000 Portion of Funding Received - 30,000 Funding Competitive?: No</p> <p>Co-investigator : Jun Yan; Yong Zeng</p>
2021/6 - 2023/6 Principal Investigator	<p>Data-Driven Optimization Framework for Next Generation Manufacturing, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 346,666 Portion of Funding Received - 346,666 Funding Competitive?: Yes</p>
2016/5 - 2022/4 Principal Investigator	<p>Dynamic Scheduling Mechanism Design in Multi-Agent Systems, Grant</p> <p>Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grants - Individual Total Funding - 120,000 Portion of Funding Received - 120,000 Funding Competitive?: Yes</p>
2020/11 - 2021/2 Principal Investigator	<p>An efficient heuristic algorithm for laboratory analysis profile selection, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Total Funding - 15,000 Portion of Funding Received - 15,000</p>

Funding Competitive?: No

Completed [n=3]

- 2019/11 - 2021/8
Principal Investigator Data driven energy efficient base station sleep control for 5G systems, Grant
Funding Sources:
Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 53,333
Portion of Funding Received - 53,333
Funding Competitive?: Yes
- 2018/1 - 2018/6
Principal Investigator A decision support framework for optimizing tube utilization in laboratory tests, Grant
Funding Sources:
Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 15,000
Portion of Funding Received - 15,000
Funding Competitive?: Yes
- 2016/10 - 2017/4
Principal Investigator Agent-based scheduling in community health care, Grant
Funding Sources:
Mathematics of Information Technology and Complex Systems (MITACS)
Accelerate
Total Funding - 15,000
Portion of Funding Received - 15,000
Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=10]

- 2022/1 - 2023/12
Principal Supervisor Normandin-Taillon, Hubert (In Progress) , Concordia University
Student Degree Expected Date: 2023/5
Thesis/Project Title: Data-Driven Models for Portfolio Optimization
Present Position: Research assistant, Concordia University
- 2021/5 - 2023/5
Principal Supervisor Farhat, Abdallah (Completed) , Concordia University
Thesis/Project Title: Evaluation of Citation Graph Thematic Dataset Construction and Paper Filtering Methods for Research Literature Recommendation
Present Position: Research assistant
- 2021/5 - 2023/3
Principal Supervisor Annabathuni, Sandeep Chowdary (Completed) , Concordia University
Thesis/Project Title: Mitigating the Cold-Start Problem by Leveraging Category Level Associations
Present Position: Research assistant
- 2021/5 - 2023/3
Principal Supervisor Zaeimi, Mohammadmahdi (Completed) , Concordia University
Thesis/Project Title: Simulation platform design for mobility on demand systems
Present Position: Research assistant

2021/5 - 2023/12 Principal Supervisor	Ta, Andy (In Progress) , Concordia University Student Degree Expected Date: 2023/5 Thesis/Project Title: Text mining algorithms for nurse agency services Present Position: Research assistant
2020/1 - 2023/7 Principal Supervisor	Shi, Fangzhu (Completed) , Concordia University Thesis/Project Title: Demand forecasting in medical supply chains Present Position: Research Associate
2017/9 - 2019/8 Co-Supervisor	Hu, Chengming (Completed) , Concordia University Thesis/Project Title: Machine learning algorithms for smart grid security Present Position: PhD student at McGill University
2017/9 - 2019/8 Principal Supervisor	Hou, Shixuan (Completed) , Concordia University Thesis/Project Title: Dynamic two sided matching algorithms Present Position: PhD student at Concordia University
2017/1 - 2020/8 Principal Supervisor	Rezaei, Narges (Completed) , Concordia University Thesis/Project Title: A DATA-DRIVEN OPTIMIZATION METHOD FOR TAXIDISPATCHING PROBLEM Present Position: MBA program, University of Toronto
2015/9 - 2017/11 Principal Supervisor	Rezaei, Hamidreza (Completed) , Concordia University Thesis/Project Title: Modellingand Solving Decentralized and Dynamic Aircraft Landing Scheduling Problems Present Position: Research associate
Doctorate [n=14]	
2023/9 - 2027/8 Co-Supervisor	Sarah Farahdel (In Progress) , Concordia University Student Degree Expected Date: 2027/8 Thesis/Project Title: Sustainability Assessment Framework Present Position: Research assistant
2023/1 - 2026/12 Principal Supervisor	Nima Moradi (In Progress) , Concordia University Student Degree Expected Date: 2026/12 Thesis/Project Title: Sustainable and smart last mile delivery Present Position: Research assistant
2022/9 - 2026/8 Principal Supervisor	Rasoolabadi, Mozhddeh Noroozi (In Progress) , Concordia University Student Degree Expected Date: 2026/8 Thesis/Project Title: Group Role Assignment with Constraints Present Position: Research assistant, Concordia University
2021/9 - 2025/9 Co-Supervisor	Valipour, Mahsa (In Progress) , Concordia University Student Degree Expected Date: 2025/9 Thesis/Project Title: Matching mechanism design for home healthcare services Present Position: Research assistant, Concordia University
2020/9 - 2024/9 Co-Supervisor	Nejadshamsi, Shayan (In Progress) , Concordia University Student Degree Expected Date: 2024/9 Thesis/Project Title: Agent-based simulation on urban transportation networks Present Position: PhD student at Concordia University
2020/5 - 2024/1 Co-Supervisor	Seyedan, Seyedehmahya (In Progress) , Concordia University Student Degree Expected Date: 2024/1 Thesis/Project Title: Machine learning methods for supply chain demand forecasting Present Position: Research Associate

2020/1 - 2024/12
Principal Supervisor Xu, Xinkai (In Progress) , Concordia University
Student Degree Expected Date: 2024/12
Thesis/Project Title: Data driven optimization
Present Position: Research Associate

2019/9 - 2024/8
Principal Supervisor Hou, Shixuan (In Progress) , Concordia University
Student Degree Expected Date: 2024/8
Thesis/Project Title: Two-sided market optimization through simulation
Present Position: Research Associate

2018/9 - 2024/7
Co-Supervisor Rahman, Osmud (In Progress) , Concordia University
Student Degree Expected Date: 2024/7
Thesis/Project Title: Text mining for meta-analysis Cross-cultural research on fashion consumption
Present Position: Associate professor, Ryerson University

2017/5 - 2022/9
Principal Supervisor Li, Xiaoming (Completed) , Concordia University
Thesis/Project Title: Data Driven Optimization Methods
Present Position: Research Associate, Concordia University

2016/11 - 2019/3
Co-Supervisor Liu, Lu (Completed) , Dalian University of Technology
Thesis/Project Title: MechanismDesign for Operation Room Scheduling Considering Surgeons' Time Preferences
Present Position: University lecture, Zhejiang University of Technology

2016/9 - 2021/12
Principal Supervisor Gao, Jie (Completed) , Concordia University
Thesis/Project Title: Matching mechanisms for two-sided shared mobility systems
Present Position: Postdoctorial Fellow, HEC Montreal

2016/9 - 2020/11
Co-Supervisor Hou, Luyang (Completed) , Concordia University
Thesis/Project Title: Auction Mechanisms for Electric Vehicle Charging Scheduling
Present Position: Research Scientist, Beijing University of Posts and Telecommunications

2015/9 - 2021/4
Principal Supervisor Crespo, Antonio Márcio Ferreira (Completed) , Concordia University
Thesis/Project Title: Computational Learning Framework for Carbon Emissions Predictions Incorporating a RReliefF Driven Features Selection and an Iterative Neural Network Architecture Improvement
Present Position: Director, UNICA Institute, Montreal

Post-doctorate [n=2]

2022/1 - 2022/4
Principal Supervisor Kafiabad, Shayan Tavakoli, Concordia University
Thesis/Project Title: Machine learning methods for stochastic inventory models
Present Position: Unknown

2022/1 - 2022/10
Principal Supervisor Gao, Jie, Concordia University
Thesis/Project Title: Data-driven optimization models for mobility on demand
Present Position: Postdoctorial Fellow, HEC Montreal

Research Associate [n=1]

2018/1 - 2020/1
Principal Supervisor Wong, Terrence (Completed) , Concordia University
Thesis/Project Title: Design and implementation of a simulation platform for mobility on demand applications
Present Position: Software Engineer, Duolingo USA

Event Administration

2023/3 - 2023/9 Publication chair, The 23rd IEEE International Conference on Scalable Computing and Communications, Aug. 2023, UK, Conference, 2023/8 - 2023/8

Editorial Activities

2018/11 - 2022/12 Associate Editor, IET Collaborative Intelligent Manufacturing, Journal
 2018/5 - 2022/12 Reviewer, IEEE Transactions on Intelligent Transportation Systems, Journal
 2020/1 - 2020/10 Reviewer, Advanced Engineering Informatics, Journal
 2020/4 - 2020/5 Reviewer, IEEE Access, Journal
 2018/4 - 2018/5 Reviewer, International Journal of Production Research, Journal
 2017/1 - 2018/1 Reviewer, IEEE Transactions on System, Man and Cybernetics, Journal
 2017/5 - 2017/6 Reviewer, Artificial Intelligence in Medicine, Journal

Organizational Review Activities

2021/12 - 2022/1 External Reviewer, Natural Sciences and Engineering Research Council of Canada (NSERC)
 Discovery grant external reviewer
 2021/5 - 2021/6 External Reviewer, Mathematics of Info Tech & Complex Systems
 External reviewer for a Mitacs Accelerate grant application

International Collaboration Activities

2022/8 - 2022/12 Lead Researcher, United States of America
 Collaborative project with a professor at Texas Tech University on learning from crowdsourced labeling on shared mobility data. I am in the process of developing a grant application on data driven shared mobility system optimization. The professor at Texas Tech will contribute by providing support on crowdsourced labeling techniques.
 2022/3 - 2022/12 Research Collaborator, Ireland
 Collaborative project on e-bike energy consumption prediction, charging management and fleet assignment optimization with a professor from Dublin City University and a local e-bike service provider in Dublin.
 2020/8 - 2021/7 Research Collaborator, China
 Collaborative project on emergency medical supply chain management. I worked with professors at Huazhong University of Science and Technology. I was involved in the development of their funding application and data analysis.

Text Interviews

2020/02/05 Building a better blood test: With increasing demands for health security across the world, Canadian researchers seek to reinforce hospital systems for quicker diagnoses, The Globe and Mail. The content of this interview as based on my collaboration activities with Jewish General Hospital Montreal and Medialpha Inc.

Publications

Journal Articles

1. Nejadshamsi, Shayan; Eicker, Ursula; Wang, Chun; Bentahar, Jamal. (2023). Data sources and approaches for building occupancy profiles at the urban scale – A review. *Building and Environment*. 238: 110375.
Published
Refereed?: Yes, Open Access?: No
2. Hou, Luyang; Li, Yuanliang; Yan, Jun; Wang, Chun; Wang, Li; Wang, Biao. (2023). Multi-agent reinforcement mechanism design for dynamic pricing-based demand response in charging network . *International Journal of Electrical Power and Energy Systems*. 147(May): 108843.
Published
Refereed?: Yes, Open Access?: No
3. Hou*, Shixuan; Gao*, Jie; Wang, Chun. (2023). Optimization Framework for Crowd-Sourced Delivery Services with the Consideration of Shippers' Acceptance Uncertainties. *IEEE Transactions on Intelligent Transportation Systems*. 24(1): 684-693.
Published
Refereed?: Yes, Open Access?: No
4. Nejadshamsi, Shayan Eicker, Ursula Wang, Chun Bentahar, Jamal. (2023). Data sources and approaches for building occupancy profiles at the urban scale – A review. *Building and Environment*. 238: 110375.
Published
Refereed?: Yes, Open Access?: No
5. Seyedan, Mahya; Mafakheri, Fereshteh; Wang, Chun. (2023). Order-up-to-level inventory optimization model using time-series demand forecasting with ensemble deep learning. *Supply Chain Analytics*. 3: 100024.
Published
Refereed?: Yes, Open Access?: Yes
6. Hou*, Shixuan; Gao*, Jie; Wang, Chun. (2022). Design for Supply Chain, Design for Mass Customization and Design for Manufacturing: A Review of the Literature. *IET Collaborative Intelligent Manufacturing*. 4(1): 1-16.
Published
Refereed?: Yes, Open Access?: Yes
7. Liu*, Lu; Wang, Chun; Wang, Jian-Jun; Crespo*, Antonio Marcio Ferreira. (2022). An iterative auction for resource-constrained surgical scheduling. *Journal of the Operational Research Society*, <https://doi.org/10.1080/01605682.2022.2083988>.
In Press
Refereed?: Yes, Open Access?: No
8. Hou*, Luyang; Yan, Jun; Wang, Chun; Ge, Lei Jiao. (2022). A Simultaneous Multi-Round Auction Design for Scheduling Multiple Charges of Battery Electric Vehicles on Highways. *IEEE Transactions on Intelligent Transportation Systems*. 23(7): 8024-8036.
Published
Refereed?: Yes, Open Access?: No
9. Gao*, Jie; Li*, Xiaoming; Wang*, Chun; Huang, Xiao. (2022). BM-DDPG: An Integrated Dispatching Framework for Ride-Hailing Systems. *IEEE Transactions on Intelligent Transportation Systems*. 23(8): 11666-11676.
Published
Refereed?: Yes, Open Access?: No

10. Li*, Xiaoming; Gao*, Jie; Wang, Chun; Huang, Xiao; Nie, Yimin. (2022). Ride-Sharing Matching under Travel Time Uncertainty through Data-Driven Robust Optimization. IEEE Access.
Accepted
Refereed?: Yes, Open Access?: Yes
11. Li*, Xiaoming; Wang, Chun; Huang, Xiao. (2022). A Data-Driven Approach for Vehicle Relocation in Car-Sharing Services with Balanced Supply-Demand Ratios. International Journal of Intelligent Transportation Systems Research. 20(1): 75-89.
Published
Refereed?: Yes, Open Access?: No
12. Li*, Xiaoming; Gao*, Jie; Wang, Chun; Huang, Xiao; Nie, Yimin. (2022). Mixture Density Networks Enabled Stochastic Optimization for Idle Vehicle Proactive Guidance in Ride-Hailing Systems. IEEE Systems, Man, and Cybernetics Magazine.
Accepted
Refereed?: Yes, Open Access?: No
13. Gao*, Jie; Wong*, Terrence; Selim, Bassant; Wang, Chun. (2022). VOMA: A Privacy-Preserving Matching Mechanism Design for Community Ride-Sharing. IEEE Transactions on Intelligent Transportation Systems. 10.1109/TITS.2022.31
In Press
Refereed?: Yes, Open Access?: No
14. Seyedan*, Mahya; Mafakheri, Fereshteh; Wang, Chun. (2022). Cluster-based demand forecasting using Bayesian model averaging: An ensemble learning approach. Decision Analytics Journal. 3: 100033.
Published
Refereed?: Yes, Open Access?: Yes
15. Gao*, Jie; Li*, Xiaoming; Wang, Chun; Huang, Xiao. (2022). A pricing mechanism for ride-hailing systems in the presence of driver acceptance uncertainty. IEEE Access. 10: 83017-83028.
Published
Refereed?: Yes, Open Access?: Yes
16. Gao*, Jie; Wang, Chun; Yu, Jiayuan; Wong*, Terrence. (2021). A Price-Based Iterative Double Auction for Charger Sharing Markets. IEEE Transactions on Intelligent Transportation Systems, DOI: 10.1109/TITS.2020.3047984. 23(6): 5116-5127.
Published
Refereed?: Yes, Open Access?: No
17. Gao*, Jie; Wang, Chun; Wong, Terrence. (2021). Social welfare maximizing taxi fleet charging scheduling through voting-based negotiation. Transportation Research Part C, <https://doi.org/10.1016/j.trc.2021.103304>. 130: 103304.
Published
Refereed?: Yes, Open Access?: No
18. Crespo*, Antonio M.F.; Wang, Chun; Crespo, Thiago M.F.; Li, Weigang; Barreto, Alexandre. (2021). Learning Framework for Carbon Emissions Predictions Incorporating a ReliefF Driven Features Selection and an Iterative Neural Network Architecture Improvement. SN Applied Sciences, <https://doi.org/10.1007/s42452-021-04411-z>. 3(4): 1-18.
Published
Refereed?: Yes
19. Hou*, Luyang; Wang, Chun; Yan, Jun. (2020). Bidding for Preferred Timing: An Auction Design for Electric Vehicle Charging Station Scheduling. IEEE Transactions on Intelligent Transportation Systems. 21(8): 3332-3343.
Published
Refereed?: Yes, Open Access?: No

20. Fan, Guodong; Zhu, Ming; Li, Jing; Wang, Chun; Zhao, Lei. (2020). A Graph Database-based Approach Utilizing FAHP and Directed Bipartite Graph for Service Composition. *Service Oriented Computing and Applications*. 14(4): 269-281.
Published
Refereed?: Yes, Open Access?: No
21. Hou*, Luyang; Yan, Jun; Wang, Chun. (2020). An Incentive-Compatible Combinatorial Auction Design for Charging Network Scheduling of Battery Electric Vehicles. *Journal of Integrated Design & Process Science*. 24(2): 75-92.
Published
Refereed?: Yes, Open Access?: No
22. Liu*, Lu; Wang, Chun; Jian-Jun Wang. (2019). A combinatorial auction mechanism for surgical scheduling considering surgeon's private availability information. *Journal of Combinatorial Optimization*. 37(1): 405-417.
Published
Refereed?: Yes, Open Access?: No
23. Gao*, Jie; Wong*, Terrence; Wang, Chun. (2019). Coordinating Patient Preferences through Automated Negotiation: A Multiagent Systems Model for Diagnostic Services Scheduling. *Advanced Engineering Informatics*. 42: 100934.
Published
Refereed?: Yes, Open Access?: No
24. Gao*, Jie; Xie*, Zhijie; Wang, Chun. (2018). A Market-Based Scheduling Mechanism Design for Cost Reduction in Home Health Care. *Journal of Integrated Design and Process Science*,. 22(4): 41-54.
Published
Refereed?: Yes, Open Access?: No

Book Chapters

1. Hou*, Luyang; Wang, Chun; Yan, Jun. (2019). Electric Vehicle Charging Scheduling in Green Logistics: Challenges, Approaches and Opportunities. *Sustainable City Logistics Planning: A multi-criteria perspective*. : Vol. 2.
Published, Nova Science Publishers, Inc.
Refereed?: Yes
2. Crespo*, Antonio; Wang, Chun. (2019). European Union Emissions Trading Scheme: Design evolution and effectiveness analysis. Anjali Awasthi, Katarzyna Grzybowska. *Handbook of Research on Interdisciplinary approaches to sustainable supply chain management*. : 189-210.
Published, IGI Global
Refereed?: Yes

Conference Publications

1. Rasoolabadi, Mozhddeh Noroozi; Zhu, Haibin; Wang, Chun. (2023). Solving the Many to Many Grouped Task Allocation Problem via E-CARGO. 20th IEEE International Conference on Networking, Sensing and Control, Marseille, France
Conference Date: 2023/10
Paper
Accepted
Refereed?: Yes, Invited?: No

2. Li, Xiaoming; Normandin-Taillon, Hubert; Wang, Chun; Huang, Xiao. (2023). Demand Density Forecasting in Mobility-on-Demand Systems through Recurrent Mixture Density Networks. IEEE 26th International Conference on Intelligent Transportation Systems. IEEE 26th International Conference on Intelligent Transportation Systems (ITSC 2023), Bilbao, Spain
Conference Date: 2023/9
Paper
Accepted
Refereed?: Yes, Invited?: No
3. Hou*, Luyang; Wang, Chun. (2022). Optimal Power Management for the Integrated Multiple Energy Carrier System. The 35th Canadian Conference on Electrical and Computer Engineering (CCECE 2022), Halifax, Canada
Conference Date: 2022/9
Paper
Accepted
Refereed?: Yes, Invited?: No
4. Li*, Xiaoming; Gao*, Jie; Wang, Chun; Huang, Xiao; Nie, Yimin. (2021). Driver guidance and rebalancing in ride-hailing systems through mixture density networks and stochastic programming. 2021 IEEE International Smart Cities Conference (ISC2). IEEE International Smart Cities Conference 2021, Manchester, United Kingdom
Conference Date: 2021/9
Paper
Published
Refereed?: Yes, Invited?: No
5. Li*, Xiaoming; Gao*, Jie; Wang, Chun; Huang, Xiao; Nie, Yimin. (2021). Ride-sharing matching under travel time uncertainty through a data-driven robust optimization approach. 2021 IEEE International Intelligent Transportation Systems Conference (ITSC). 2021 IEEE International Intelligent Transportation Systems Conference (ITSC), Indianapolis, United States of America
Conference Date: 2021/9
Paper
Published
Refereed?: Yes, Invited?: No
6. Li*, Xiaoming; Gao*, Jie; Wang, Chun; Huang, Xiao; Nie, Yimin. (2021). Order dispatching in ride-sharing platform under travel time uncertainty: a data-driven robust optimization approach. 2021 IEEE International Conference on Autonomous Systems (ICAS). 2021 IEEE International Conference on Autonomous Systems (ICAS), Montreal, Canada
Conference Date: 2021/8
Paper
Published
Refereed?: Yes, Invited?: No
7. Li*, Xiaoming; Wang, Chun; Huang, Xiao; Nie, Yimin. (2020). A Data-Driven Dynamic Stochastic Programming Framework for Ride-Sharing Rebalancing Problem under Demand Uncertainty. 2020 IEEE Intl Conf on Parallel & Distributed Processing with Applications, Big Data & Cloud Computi. 18th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA), Exeter, United Kingdom (1120-1125)
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No

8. Gao*, Jie; Li*, Xiaoming; Wang, Chun. (2020). Learning-based open driver guidance and rebalancing for reducing riders' wait time in ride-hailing platforms. Proceedings of 2020 IEEE International Smart Cities Conference. 2020 IEEE International Smart Cities Conference (ISC2), Piscataway, United States of America (342-348)
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
9. Li*, Xiaoming; Wang, Chun; Huang, Xiao. (2020). Reducing Car-Sharing Relocation Cost through Non-Parametric Density Estimation and Stochastic Programming. 2020 IEEE 23rd International Conference on Intelligent Transportation Systems (ITSC). 2020 IEEE 23rd International Conference on Intelligent Transportation Systems (ITSC), Rhodes, Greece
Conference Date: 2020/10
Paper
Published
Refereed?: Yes, Invited?: No
10. Hou*, Luyang; Ma, Shuai; Yan, Jun; Wang, Chun; Yu, Jia Yuan. (2020). Reinforcement Mechanism Design for Electric Vehicle Demand Response in Microgrid Charging Stations. 2020 International Joint Conference on Neural Networks (IJCNN). 2020 International Joint Conference on Neural Networks (IJCNN), Glasgow, United Kingdom
Conference Date: 2020/2
Paper
Published
Refereed?: Yes, Invited?: No
11. Hu*, Chengming; Yan, Jun; Wang, Chun. (2019). Robust Feature Extraction and Ensemble Classification Against Cyber-Physical Attacks in the Smart Grid. 2019 IEEE Electrical Power and Energy Conference (EPEC). The annual IEEE Canada Electrical Power and Energy Conference (EPEC 2019), Montréal, Canada
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
12. Fan, Guodong; Zhu, Ming; Li, Jing; Wang, Chun; Zhao, Lei. (2019). A Graph Database-based Approach Utilizing FAHP and Directed Bipartite Graph for Service Composition. The 17th International Conference on Service-Oriented Computing (ICSOC 2019), Toulouse, France
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No
13. Gao*, Jie; Wang, Chun; Yu, Jia Yuan. (2019). Scheduling Electric Vehicles to Chargers through Iterative Double Auction Mechanism. 2019 IEEE International Smart Cities Conference (ISC2). 5th IEEE International Smart Cities Conference (ISC2 2019), Casablanca, Morocco (342-348)
Conference Date: 2019/10
Paper
Published
Refereed?: Yes, Invited?: No

14. Hu*, Chengming; Yan, Jun; Wang, Chun. (2019). Advanced Cyber-Physical Attack Classification with Extreme Gradient Boosting for Smart Transmission Grids. 2019 IEEE Power & Energy Society General Meeting (PESGM). 2019 IEEE Power and Energy Society General Meeting, Atlanta, United States of America
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
15. Hou*, Luyang; Yan, Jun; Wang, Chun. (2019). Accommodating More Users in Highway Electric Vehicle Charging through Coordinated Booking: A Market-Based Approach. 2019 IEEE 23rd International Conference on Computer Supported Cooperative Work in Design (CSCWD). International Conference on Computer Supported Cooperative Work in Design, Porto, Portugal
Conference Date: 2019/5
Paper
Published
Refereed?: Yes, Invited?: No
16. Rezaei*, Hamid; Crespo*, Antonio M. F.; Chen, Mingyuan; Wang*, Chun. (2018). An Iterative Bidding Approach Applied to Cost Reduction in the Context of Aircraft Landing Problem. IEEE 22nd International Conference on Computer Supported Cooperative Work in Design, Nanjing, China (1-6)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No
17. Gao*, Jie; Wang, Chun. (2018). Automated Negotiation Protocol for Collaborative Diagnostic Services Scheduling. 2018 IEEE 22nd International Conference on Computer Supported Cooperative Work in Design ((CSCWD)). IEEE 22nd International Conference on Computer Supported Cooperative Work in Design, Nanjing, China (140-145)
Conference Date: 2018/5
Paper
Published
Refereed?: Yes, Invited?: No
18. Hou*, Luyang; Wang, Chun. (2017). Market-based mechanisms for smart grid management: Necessity, applications and opportunities. IEEE International Conference on Systems, Man, and Cybernetics, (2613-2618)
Conference Date: 2017/10
Paper
Published
Refereed?: Yes, Invited?: No



Protected when completed

Date Submitted: 2022-10-28 11:12:50

Confirmation Number: 1531796

Template: NSERC_Researcher

Dr. LINGYU WANG

Correspondence language: English

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Dr. LINGYU WANG

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes

Degrees

- 2006/6 Doctorate, Information Technology, George Mason University
Supervisors: Sushil Jajodia and Duminda Wijesekera, 2000/8 - 2006/7

Recognitions

- 2022/10 Google Scholar Citation and H-index
Google Scholar
Citation
Citations > 7000 h-index = 42 according to Google Scholar as of October 2022
- 2019/9 - 2024/8 Industrial Research Chair (IRC)
Natural Sciences and Engineering Research Council of Canada (NSERC)
Distinction
Holder of NSERC/Ericsson Industrial Research Chair (IRC) in SDN/NFV Security
- 2019/7 Best Paper Award
33rd Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC 2019)
Prize / Award
Best Paper Award
- 2018/7 Best Student Paper Award
32nd Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC 2018)
Prize / Award
Best Student Paper Award

User Profile

Research Specialization Keywords: Cloud Security, SDN/NFV Security, Container Security, Security Metrics, Threat Modeling, Security Auditing, Attack Detection, Attack Mitigation

Employment

2017/6	Professor Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science, Concordia University Full-time, Professor Tenure Status: Tenure
2010/6 - 2017/5	Associate Professor Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science, Concordia University Full-time, Associate Professor Tenure Status: Tenure
2006/8 - 2010/6	Assistant Professor Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science, Concordia University Full-time, Assistant Professor Tenure Status: Tenure Track

Research Funding History

Awarded [n=3]

2019/9 - 2024/8 Principal Investigator	SDN/NFV Security: Compliance-Driven Monitoring, Detection, and Mitigation, Grant Funding Sources: Canada Foundation for Innovation (CFI) John R. Evans Leaders Fund – Partnerships Total Funding - 233,103 Portion of Funding Received - 233,103 Funding Competitive?: Yes
2019/9 - 2024/8 Principal Investigator	NSERC/Ericsson Industrial Research Chair (IRC) in SDN/NFV Security, Research Chair Funding Sources: Ericsson Research Canada Total Funding - 625,000 Portion of Funding Received - 625,000 Funding Competitive?: Yes Concordia University Total Funding - 568,970 Portion of Funding Received - 568,970 Funding Competitive?: Yes Natural Sciences and Engineering Research Council of Canada (NSERC) Industrial Research Chair Total Funding - 625,000 Portion of Funding Received - 625,000 Funding Competitive?: Yes
2017/4 - 2023/3 Principal Investigator	Improving the Resilience of Computing Infrastructures against Zero Day Attacks through Quantitative Threat Modeling and Network Hardening, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Total Funding - 156,000 Portion of Funding Received - 156,000

Funding Competitive?: Yes

Completed [n=4]

2018/1 - 2019/8
Principal Investigator

Auditing and Monitoring the Security of NFV and SDN-based Cloud Environments, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
CRD

Total Funding - 313,050

Portion of Funding Received - 313,050

Funding Competitive?: Yes

Ericsson Research Canada

CRD

Total Funding - 180,000

Portion of Funding Received - 180,000

Funding Competitive?: Yes

2015/1 - 2017/12
Principal Investigator

Audit Ready Cloud, Grant

Funding Sources:

Ericsson Research Canada

CRD

Total Funding - 105,000

Portion of Funding Received - 105,000

Funding Competitive?: Yes

Natural Sciences and Engineering Research Council of Canada (NSERC)

CRD

Total Funding - 182,610

Portion of Funding Received - 182,610

Funding Competitive?: Yes

2013/4 - 2017/3
Principal Investigator

A Vulnerability-Centric Approach to Network Security Metrics, Grant

Funding Sources:

The Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery Grant

Total Funding - 110,000

Portion of Funding Received - 110,000

Funding Competitive?: Yes

2013/8 - 2016/7
Co-investigator

Software Fingerprinting for Automated Malicious Code Analysis, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

DNDPJ

Total Funding - 208,695

Portion of Funding Received - 40,000

Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=10]

2022/9 - 2024/8 Co-Supervisor	Jia Wei Yao (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: Proactive Security Enforcement for 5G Core Present Position: Master Student, Concordia University
2020/9 - 2023/4 Co-Supervisor	Mahmood Gholipour (In Progress) , Concordia University Student Degree Expected Date: 2023/4 Thesis/Project Title: Security Auditing for 5G Core and Edge Multi-Cluster Environments Present Position: Master Student, Concordia University
2019/9 - 2022/12 Co-Supervisor	Hugo Kermabon-Bobinnec (In Progress) , Concordia University Student Degree Expected Date: 2022/12 Thesis/Project Title: Universal Security Hardening of 5G Core Functions through Provenance Analysis Present Position: Master Student, Concordia University
2018/9 - 2020/9 Co-Supervisor	Sudershan Lakshmanan (Completed) , Concordia University Thesis/Project Title: Caught-in-Translation (CiT): Modeling and Detecting Cross-level Inconsistency Attacks in Network Functions Virtualization (NFV) Present Position: IT Security Engineer, University of Basel (Switzerland)
2017/9 - 2019/8 Principal Supervisor	Gagandeep Singh Chawla (Completed) , Concordia University Thesis/Project Title: A State-Based Proactive Approach to Network Isolation Verification in Clouds Present Position: Security Engineer, Amazon AWS
2016/9 - 2018/8 Co-Supervisor	Momen Oqaily (Completed) , Concordia University Thesis/Project Title: Protecting Audit Data Using Segmentation-based Anonymization for Multi-tenant Cloud Auditing Present Position: Ph.D. student, Concordia University
2016/1 - 2017/12 Principal Supervisor	Amir Alimohammadifar (Completed) , Concordia University Thesis/Project Title: Verifying Network Topology in Software Defined Networks Using a Stealthy Probing-Based Verification (SPV) Present Position: Site Reliability Engineer II, Skytap
2015/1 - 2017/4 Principal Supervisor	Yushun Wang (Completed) , Concordia University Thesis/Project Title: TenantGuard: Scalable Runtime Verification of Cloud-Wide VM-Level Network Isolation Present Position: Security Developer, World Anti-Doping Agency
2014/9 - 2019/1 Principal Supervisor	Alis Rasic (Completed) , Concordia University Thesis/Project Title: Anonymization of Event Logs for Network Security Monitoring Present Position: Software Engineer, Above Security (Hitachi)
2014/9 - 2018/2 Principal Supervisor	Yue Xin (Completed) , Concordia University Thesis/Project Title: Common Attack Surface Detection Present Position: Application Support Analyst, Société Générale, Canada

Doctorate [n=15]

2020/9 - 2024/4 Co-Supervisor	Sima Bagheri (In Progress) , Concordia University Student Degree Expected Date: 2024/4 Thesis/Project Title: Cluster-Level Proactive Security Mitigation for 5G Core Functions Present Position: PhD Student, Concordia University
2020/1 - 2023/6 Co-Supervisor	A S M Asadujjaman (In Progress) , Concordia University Student Degree Expected Date: 2023/6 Thesis/Project Title: Blackbox Auditing in NFV and Container Cluster Present Position: PhD Student, Concordia University
2019/9 - 2023/12 Co-Supervisor	Momen Oqaily (In Progress) , Concordia University Student Degree Expected Date: 2023/12 Thesis/Project Title: Two Stage Security Auditing for NFV Hosted on 3rd Party Clouds Present Position: PhD Student, Concordia University
2018/9 - 2022/10 Co-Supervisor	Azadeh Tabiban (Completed) , Concordia University Thesis/Project Title: Provenance Analysis in Virtualized Environments Present Position: Postdoctoral Fellow, Ericsson Canada
2018/9 - 2023/8 Co-Supervisor	Ataollah Changizi (In Progress) , Concordia University Student Degree Expected Date: 2023/8 Thesis/Project Title: Distributed Machine Learning for Security Present Position: Ph.D. student, Concordia University
2018/1 - 2022/12 Co-Supervisor	Alaa Oqaily (In Progress) , Concordia University Student Degree Expected Date: 2022/12 Thesis/Project Title: Security Verification for NFV Present Position: Ph.D. student, Concordia University
2016/9 - 2022/12 Co-Supervisor	Onur Duman (In Progress) , Concordia University Student Degree Expected Date: 2022/12 Thesis/Project Title: Smart Grid Security Modeling and Hardening Present Position: Ph.D. student, Concordia University
2015/1 - 2020/12 Principal Supervisor	Meisam Mohamady (Completed) , Concordia University Thesis/Project Title: Novel Approaches to Preserving Utility in Privacy Enhancing Technologies Present Position: Assistant Professor, Iowa State University
2015/1 - 2018/7 Principal Supervisor	Suryadipta Majumdar (Completed) , Concordia University Thesis/Project Title: Proactive Security Auditing for Clouds Present Position: Assistant Professor, Concordia University
2014/9 - 2019/7 Principal Supervisor	Nawaf Alhebaishi (Completed) , Concordia University Thesis/Project Title: Threat Modeling for Cloud and NFV Infrastructures Present Position: Assistant Professor, King Abdulaziz University
2013/9 - 2021/10 Principal Supervisor	Daniel Borbor (Withdrawn) , Concordia University Thesis/Project Title: Network Security Hardening Present Position: Information Security Engineer, Genetec
2013/9 - 2019/1 Co-Supervisor	Paria Shirani (Completed) , Concordia University Thesis/Project Title: Binary Code Fingerprinting with Application to Automated Vulnerability Detection Present Position: Assistant Professor, University of Ottawa

- 2013/9 - 2018/12
Co-Supervisor
Taous Madi (Completed) , Concordia University
Thesis/Project Title: Security Auditing and Multi-Tenancy Threat Evaluation in Public Cloud Infrastructures
Present Position: Research Scientist, King Abdullah University of Science and Technology
- 2013/1 - 2018/4
Co-Supervisor
Saed Alrabaee (Completed) , Concordia University
Thesis/Project Title: Efficient, Scalable, and Accurate Program Fingerprinting in Binary Code
Present Position: Assistant Professor, York University
- 2013/1 - 2018/2
Principal Supervisor
Mengyuan Zhang (Completed) , Concordia University
Thesis/Project Title: Network Security Metrics: Estimating the Resilience of Networks against Zero Day Attacks
Present Position: Research Assistant Professor, Hong Kong Polytechnic University

Post-doctorate [n=1]

- 2022/1 - 2023/12
Principal Supervisor
Mohammad Ekramul Kabir (In Progress) , Concordia University
Student Degree Expected Date: 2023/12
Thesis/Project Title: Proactive Security for 5G Core Container Environments
Present Position: Postdoctoral Fellow, Concordia University

Event Administration

- 2022/11 - 2022/11
PC Co-chair, The 21st Workshop on Privacy in the Electronic Society (WPES 2022), Conference, 2022/11 - 2022/11
- 2019/6 - 2019/6
PC Co-chair, The 1st Workshop on Cloud Security and Privacy (Cloud S&P 2019), Conference, 2019/6 - 2019/6
- 2016/10 - 2016/10
PC Co-Chair, The 9th International Symposium on Foundations & Practice of Security (FPS 2016), Conference, 2016/10 - 2016/10

Editorial Activities

- 2020/10 - 2024/9
Assistant Editor, Computers & Security, Journal
- 2020/1 - 2023/12
Associate Editor, Annals of Telecommunications (ANTE), Journal
- 2019/12 - 2022/12
Associate Editor, IEEE Transactions on Dependable and Secure Computing (TDSC), Journal

Organizational Review Activities

- 2022/9 - 2022/9
PC Member, The 24th International Conference on Information and Communications Security (ICICS 2022)
PC Member
- 2022/9 - 2022/9
PC Member, The 10th IEEE Conference on Communications and Network Security (CNS 2022)
PC Member
- 2022/9 - 2022/9
PC Member, The 27th European Symposium on Research in Computer Security (ESORICS) 2022
PC Member

2022/8 - 2022/8	PC Member, The 19th Annual International Conference on Privacy, Security & Trust (PST2022) PC Member
2022/8 - 2022/8	PC Member, The 4th International Conference on Science of Cyber Security (SciSec 2022) PC Member
2022/7 - 2022/7	PC Member, The 36th Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec 2022) PC Member
2022/7 - 2022/7	PC Member, The 19th International Conference on Security and Cryptography (SECRYPT 2022) PC Member
2022/6 - 2022/6	PC Member, The 37th International Conference on ICT Systems Security and Privacy Protection (SEC 2022) PC Member
2022/5 - 2022/5	PC Member, The 3rd International Workshop on Secure Mobile Cloud Computing (IWSeMC 2022) PC Member
2022/5 - 2022/5	PC Member, The IEEE International Conference on Communications (ICC 2022) PC Member
2009/11 - 2021/11	External Reviewer, Natural Sciences and Engineering Research Council of Canada (NSERC) Grant application review
2021/10 - 2021/10	PC Member, The 9th IEEE Conference on Communications and Network Security (CNS 2021) PC Member
2021/10 - 2021/10	PC Member, The 26th European Symposium on Research in Computer Security (ESORICS 2021) PC Member
2021/9 - 2021/9	PC Member, The 23rd International Conference on Information and Communications Security (ICICS 2021) PC Member
2021/7 - 2021/7	PC Member, The 35th Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec 2021) PC Member
2021/6 - 2021/6	PC Member, The IEEE International Conference on Communications (ICC 2021) PC Member
2021/6 - 2021/6	PC Member, The 37th International Conference on ICT Systems Security and Privacy Protection (SEC 2021) PC Member
2020/12 - 2020/12	PC Member, The 12th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2020) PC Member
2020/9 - 2020/9	PC Member, The 25th European Symposium on Research in Computer Security (ESORICS 2020) PC Member

2020/8 - 2020/8	PC Member, The 22nd International Conference on Information and Communications Security (ICICS 2020) PC Member
2020/7 - 2020/7	PC Member, The 17th International Conference on Security and Cryptography (SECRYPT 2020) PC Member
2020/7 - 2020/7	PC Member, The 34th Annual IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec 2020) PC Member
2020/6 - 2020/6	PC Member, The 8th IEEE Conference on Communications and Network Security (CNS 2020) PC Member
2020/6 - 2020/6	PC Member, The IEEE International Conference on Communications (ICC 2020) PC Member
2020/6 - 2020/6	PC Member, The 18th International Conference on Applied Cryptography and Network Security (ACNS 2020) PC Member
2020/5 - 2020/5	PC Member, The 35th IFIP TC-11 International Information Security and Privacy Conference (SEC 2020) PC Member
2020/5 - 2020/5	PC Member, The First International Workshop on Secure Mobile Cloud Computing (IWSeMC-20) PC Member
2019/12 - 2019/12	PC Member, The 11th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2019) PC Member
2019/12 - 2019/12	PC Member, The 21st International Conference on Information and Communications Security (ICICS 2019) PC Member
2019/12 - 2019/12	PC Member, The 11th International Symposium on Cyberspace Safety and Security (CSS 2019) PC Member
2019/11 - 2019/11	PC Member, The 16th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2019) PC Member
2019/11 - 2019/11	PC Member, The 14th International Conference on Risks and Security of Internet and Systems (CRiSIS 2019) PC Member
2019/11 - 2019/11	PC Member, The 2019 IEEE Conference on Dependable and Secure Computing (DSC 2019) PC Member
2019/9 - 2019/9	PC Member, The 24th European Symposium on Research in Computer Security (ESORICS 2019) PC Member
2019/8 - 2019/8	PC Member, The 2nd International Conference on Science of Cyber Security (SciSec'2019) PC Member

2019/8 - 2019/8	PC Member, The 18th IEEE International Conference on Trust, Security and Privacy in Computing and Communication PC Member
2019/7 - 2019/7	PC Member, The 16th International Conference on Security and Cryptography (SECRYPT 2019) PC Member
2019/7 - 2019/7	PC Member, The 33rd Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy PC Member
2019/7 - 2019/7	PC Member, The IEEE Workshop on Security, Trust and Privacy for Software and Application (STPSA 2019) PC Member
2019/6 - 2019/6	PC Member, The 14th Annual Symposium on Information Assurance (ASIA 2019) PC Member
2019/6 - 2019/6	PC Member, The 34th IFIP TC-11 SEC 2019 International Information Security and Privacy Conference (SEC 2019) PC Member
2019/5 - 2019/5	PC Member, The 2019 IEEE International Conference on Communications (ICC 2019) PC Member
2018/12 - 2018/12	PC Member, The 10th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2018) PC Member
2018/11 - 2018/11	PC Member, The 11th International Symposium on Foundations & Practice of Security (FPS 2018) Paper review
2018/10 - 2018/10	PC Member, The 12th International Conference on Risks and Security of Internet and Systems (CRiSIS 2018) PC Member
2018/9 - 2018/9	PC Member, The 23rd European Symposium on Research in Computer Security (ESORICS 2018) PC Member
2018/7 - 2018/7	PC Member, The 32nd Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy PC Member
2018/7 - 2018/7	PC Member, The International Conference on Security and Cryptography (SECRYPT 2018) PC Member
2016/3 - 2018/7	External Reviewer, The Research Grants Council (RGC) of Hong Kong Grant application review
2018/5 - 2018/6	PC Member, The 4th IEEE Workshop on Security and Privacy in the Cloud (SPC 2018) PC Member
2018/4 - 2018/5	PC Member, IEEE International Conference on Communications (ICC 2018) PC Member
2018/1 - 2018/2	PC Member, The 4th IEEE Conference on Network Softwarization (IEEE NetSoft 2018) PC Member

2017/12 - 2017/12	PC Member, The 13th International Conference on Information Systems Security (ICISS 2017) PC Member
2017/9 - 2017/9	PC Member, The 12th International Conference on Risks and Security of Internet and Systems (CRiSIS 2017) PC Member
2017/8 - 2017/8	PC Member, The Third International Workshop on Graphical Models for Security (GraMSec 2017) PC Member
2017/7 - 2017/7	PC Member, The International Conference on Security and Cryptography (SECRYPT 2017) PC Member
2017/7 - 2017/7	PC Member, The 31st Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy PC Member
2017/5 - 2017/6	PC Member, The 22nd European Symposium on Research in Computer Security (ESORICS 2017) PC Member
2017/5 - 2017/5	PC Member, The IEEE International Conference on Communications (ICC 2017) PC Member
2017/4 - 2017/4	PC Member, The Fifth International Workshop on Security in Cloud Computing (SCC 2017) PC Member
2017/2 - 2017/3	PC Member, The 10th International Symposium on Foundations & Practice of Security (FPS 2017) PC Member
2016/12 - 2016/12	PC Member, The 8th International Symposium on Cyberspace Safety and Security (CSS 2016) PC Member
2016/7 - 2016/7	PC Member, The International Conference on Security and Cryptography (SECRYPT 2016) PC Member
2016/7 - 2016/7	PC Member, The 30th Annual IFIP WG 11.3 Working Conference on Data and Applications Security and Privacy PC Member
2016/6 - 2016/7	PC Member, The Third International Workshop on Graphical Models for Security (GraMSec 2016) PC Member
2016/5 - 2016/6	PC Member, The 31th IFIP TC-11 SEC 2016 International Information Security and Privacy Conference (SEC 2016) PC Member
2016/5 - 2016/5	PC Member, The 1st International Workshop on Authentication Techniques (AuthTech 2016) PC Member

Publications

Journal Articles

1. Suryadipta Majumdar*, Gagandeep Singh Chawla*, Amir Alimohammadifar*, Taous Madi*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang, and Mourad Debbabi. (2022). ProSAS: Proactive Security Auditing System for Clouds. IEEE Transactions on Dependable and Secure Computing (TDSC). 19(4): 2517 - 2534.
Published
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2. Abdullah Qasem, Paria Shirani*, Mourad Debbabi, Lingyu Wang, Bernard Lebel and Basile L. Agba. (2022). Automatic Vulnerability Detection in Embedded Device Firmware and Binary Code: Survey and Layered Taxonomies. ACM Computing Surveys (CSUR). 54(2): 1-42.
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Refereed?: Yes
3. Shangyu Xie, Meisam Mohammady*, Han Wang, Lingyu Wang, Jaideep Vaidya and Yuan Hong. (2022). A Generalized Framework for Preserving Both Privacy and Utility in Data Outsourcing. IEEE Transactions on Knowledge and Data Engineering (TKDE).
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Refereed?: Yes
4. Onur Duman*, Mengyuan Zhang*, Lingyu Wang, Mourad Debbabi, Ribal Atallah, Bernard Lebel. (2022). Factor of Security(FoS): Quantifying the Security Effectiveness of Redundant Smart Grid Subsystems. IEEE Trans. on Dependable and Secure Computing (TDSC). 19(2): 1018-1035.
Published
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5. Gagandeep Singh Chawla*, Mengyuan Zhang, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2021). VMGuard: State-based Proactive Verification of Virtual Network Isolation with Application to NFV. IEEE Trans. on Dependable and Secure Computing (TDSC). 18(4): 1553-1567.
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6. Mengyuan Zhang*, Lingyu Wang, Sushil Jajodia, Anoop Singhal. (2021). Network Attack Surface: Lifting the Concept of Attack Surface to the Network Level for Evaluating Networks' Resilience against Zero-Day Attacks. IEEE Trans. on Dependable and Secure Computing (TDSC). 18(1): 310 - 324.
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7. Meisam Mohammady*, Momen Oqaily*, Lingyu Wang, Yuan Hong, Habib Louafi, Makan Pourzandi and Mourad Debbabi. (2021). A Multi-view Approach to Preserve Both Privacy and Utility in Network Trace Anonymization. ACM Transactions on Privacy and Security (TOPS). 24(3): 14:1-14:36.
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8. Saed Alrabaee*, Mourad Debbabi and Lingyu Wang. (2020). CPA: Accurate Cross-Platform Binary Authorship Characterization Using LDA. IEEE Trans. on Information Forensics and Security (TIFS). 15(1): 3051-3066.
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9. Daniel Borbor*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2019). Optimizing the Network Diversity to Improve the Resilience of Networks Against Unknown Attacks. *Computer Communications*. 145(1): 96-112.
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Refereed?: Yes
10. Suryadipta Majumdar*, Azadeh Tabiban*, Yosr Jarraya, Momen Oqaily*, Amir Alimohammadifar*, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Learning Probabilistic Dependencies among Events for Proactive Security Auditing in Clouds. *Journal of Computer Security*. 24(2): 165-202.
Published
Refereed?: Yes
11. Nawaf Alhebaishi*, Lingyu Wang, Sushil Jajodia and Anoop Singhal,. (2019). Mitigating the Insider Threat of Remote Administrators in Clouds through Maintenance Task Assignments. *Journal of Computer Security (JCS)*. 27(4): 427-458.
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12. Saed Alrabaee*, Paria Shirani*, Lingyu Wang, Mourad Debbabi and Aiman Hanna. (2019). Decoupling Coding Habits from Functionality for Effective Binary Authorship Attribution. *Journal of Computer Security (JCS)*. 27(6): 613-648.
Published
Refereed?: Yes
13. Mengyuan Zhang*, Xavier de Carné de Carnavalet, Lingyu Wang, Ahmed Ragab. (2019). Large-Scale Empirical Study of Important Features Indicative of Discovered Vulnerabilities to Assess Application Security. *IEEE Trans. on Information Forensics and Security (TIFS)*. 14(9): 2315 - 2330.
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14. Momen Oqaily*, Yosr Jarraya, Meisam Mohammady*, Suryadipta Majumdar*, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). SegGuard: Segmentation-based Anonymization of Network Data in Clouds for Privacy-Preserving Security Auditing. *IEEE Trans. on Dependable and Secure Computing (TDSC)*. 18(5): 2486–2505.
Published
Refereed?: Yes
15. Saed Alrabaee*, Mourad Debbabi, Lingyu Wang. (2019). On the Feasibility of Binary Authorship Characterization. *Digital Investigation*. 28(Supplement): S3–S11.
Published
Refereed?: Yes
16. Daniel Borbor*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2018). Surviving Unpatchable Vulnerabilities through Heterogeneous Network Hardening Options. *Journal of Computer Security (JCS)*. 26(6): 761-789.
Published
Refereed?: Yes
17. Saed Alrabaee*, Paria Shirani*, Lingyu Wang, Mourad Debbabi. (2018). FOSSIL: A Resilient and Efficient System for Identifying FOSS Functions in Malware Binaries. *ACM Transactions on Privacy and Security (TOPS)*. 21(2): 8:1-8:34.
Published
Refereed?: Yes
18. Alireza Shameli-Sendi, Michel Dagenaisb, Lingyu Wang. (2018). Realtime Intrusion Risk Assessment Model based on Attack and Service Dependency Graphs. *Computer Communications*. 116(1): 253-272.
Published
Refereed?: Yes

19. Suryadipta Majumdar*, Taous Madi*, Yushun Wang*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). User-Level Runtime Security Auditing for the Cloud. *IEEE Transactions on Information Forensics and Security (TIFS)*. 13(5): 1185-1199.
Published
Refereed?: Yes
20. Yuan Hong, Wen Ming Liu*, Lingyu Wang. (2017). Privacy Preserving Smart Meter Streaming against Information Leakage of Appliance Status. *IEEE Transactions on Information Forensics and Security (TIFS)*. 12(9): 2227 - 2241.
Published
Refereed?: Yes
21. Mengyuan Zhang*, Lingyu Wang, Sushil Jajodia, Anoop Singhal, Massimiliano Albanese. (2016). Network Diversity: A Security Metric for Evaluating the Resilience of Networks against Zero-Day Attacks. *IEEE Transactions on Information Forensics and Security (TIFS)*. 11(5): 1071–1086.
Published
Refereed?: Yes
22. Baojiang Cui, Zheli Liu, Lingyu Wang. (2016). Key-Aggregate Searchable Encryption (KASE) for GroupData Sharing via Cloud Storage. *IEEE Transactions on Computers*. 65(8): 2374 - 2385.
Published
Refereed?: Yes
23. Baojiang Cui, Fuwei Wang, Yongle Hao, Lingyu Wang. (2016). A Taint Based Approach for Automatic Reverse Engineering of Gray-box File Formats. *Soft Computing*. 20(9): 3563–3578.
Published
Refereed?: Yes
24. Djedjiga Mouheb*, Dima Alhadidi, Mariam Nouh, Mourad Debbabi, Lingyu Wang, Makan Pourzandi. (2016). Aspect-Oriented Modeling Framework for Security Hardening. *Innovations in Systems and Software Engineering (ISSE)*. 12(1): 41-67.
Published
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25. Saed Alrabaee*, Lingyu Wang, Mourad Debbabi. (2016). BinGold: Towards robust binary analysis by extracting the semantics of binary code as semantic flow graphs (SFGs). *Digital Investigation*. 18(7)
Published
Refereed?: Yes

Books

1. Saed Alrabaee*, Mourad Debbabi, Paria Shirani*, Lingyu Wang, Amr Youssef, Ashkan Rahimian, Lina Nouh, Djedjiga Mouheb, He Huang, Aiman Hanna. (2020). *Binary Code Fingerprinting for Cybersecurity - Application to Malicious Code Fingerprinting*. : 233.
Published, Springer
Refereed?: Yes
2. Suryadipta Majumdar*, Taous Madi*, Yushun Wang*, Azadeh Tabiban*, Momen Oqaily*, Amir Alimohammadifar*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). *Cloud Security Auditing*. : 177.
Published, Springer
Refereed?: Yes
3. Lingyu Wang, Sushil Jajodia, Anoop Singhal (Eds.). (2017). *Network Security Metrics*. : 206.
Published, Springer
Refereed?: Yes

4. Frédéric Cuppens, Lingyu Wang, Nora Cuppens-Boulahia, Nadia Tawbi, Joaquín García-Alfaro (Eds.). (2017). Foundations and Practice of Security (9th International Symposium, FPS 2016, Québec City, QC, Canada, October 24-25, 2016, Revised Selected Papers). : 361.
Published, Springer
Refereed?: No
5. Wen Ming Liu*, Lingyu Wang. (2016). Preserving Privacy against Side-Channel Leaks: From Data Publishing to Web Applications. : 150.
Published, Springer
Refereed?: Yes

Book Chapters

1. Lingyu Wang, Mengyuan Zhang*, Anoop Singhal. (2018). Network Security Metrics: From Known Vulnerabilities to Zero Day Attacks. Pierangela Samarati, Indrajit Ray, Indrakshi Ray. From Database to Cyber Security. : 450–469.
Published, Springer
Refereed?: Yes

Conference Publications

1. Hugo Kermabon-Bobinnec*, Mahmood Gholipourchoubeh*, Sima Bagheri*, Suryadipta Majumdar, Yosr Jarraya, Makan Pourzandi and Lingyu Wang. (2022). ProSPEC: Proactive Security Policy Enforcement for Containers. Proc. the 12th ACM Conference on Data and Application Security and Privacy (CODASPY 2022) (Acceptance ratio $30/111 \approx 27\%$),
Paper
Published
Refereed?: Yes, Invited?: No
2. Onur Duman*, Lingyu Wang, Minh Auy, Marthe Kassoufy, Mourad Debbabi. (2022). Hardening Substations against Supply Chain Attacks Under Operational Constraints. Proc. the 13th Conference on Innovative Smart Grid Technologies (ISGT 2022),
Paper
Published
Refereed?: Yes, Invited?: No
3. Azadeh Tabiban*, Heyang Zhao, Yosr Jarraya, Makan Pourzandi, Mengyuan Zhang, Lingyu Wang. (2022). ProvTalk: Towards Interpretable Multi-level Provenance Analysis in Networking Function Virtualization (NFV). Proc. the Network and Distributed System Security Symposium (NDSS 2022) (Acceptance ratio $83/513 \approx 16.2\%$),
Paper
Published
Refereed?: Yes, Invited?: No
4. Azadeh Tabiban*, Heyang Zhao, Yosr Jarraya, Makan Pourzandi and Lingyu Wang. (2022). VinciDecoder: Automatically Interpreting Provenance Graphs into Textual Forensic Reports with Application to OpenStack. Proc. the 27th Nordic Conference on Secure IT Systems (NordSec 2022) (Acceptance ratio $20/89 \approx 22.5\%$),
Paper
Published
Refereed?: Yes, Invited?: No

5. Shangyu Xie, Meisam Mohammady*, Han Wang, Lingyu Wang, Jaideep Vaidya and Yuan Hong. (2022). Poster: A Generalized Framework for Preserving Both Privacy and Utility in Data Outsourcing. Proc. the 38th IEEE International Conference on Data Engineering (ICDE 2022),
Poster
Published
Refereed?: Yes, Invited?: No
6. Alaa Oqaily*, Yosr Jarraya, Lingyu Wang, Makan Pourzandi, Suryadipta Majumdar. (2022). MLFM: Machine Learning Meets Formal Method for Efficient Security Verification in Network Functions Virtualization (NFV). Proc. the 27th European Symposium on Research in Computer Security (ESORICS 2022) (Acceptance ratio 104/562≈18.5%),
Paper
Published
Refereed?: Yes, Invited?: No
7. A S M Asadujjaman*, Momen Oqaily*, Yosr Jarraya, Suryadipta Majumdar, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2021). Artificial Packet-Pair Dispersion (APPD): A Blackbox Approach to Verifying the Integrity of NFV Service Chains. Proc. the 9th IEEE Conference on Communications and Network Security (CNS 2021) (Acceptance ratio 32/113≈28%),
Paper
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Refereed?: Yes, Invited?: No
8. Azadeh Tabiban*, Yosr Jarraya, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2020). Catching Falling Dominoes: Cloud Management-Level Provenance Analysis with Application to OpenStack. Proc. The 8th IEEE Conference on Communications and Network Security (CNS 2020),
Paper
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Refereed?: Yes, Invited?: No
9. Nawaf Alhebaishi*, Lingyu Wang and Sushil Jajodia. (2020). Modeling and Mitigating Security Threats in Network Functions Virtualization (NFV),". Proc. 34th Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSec 2020),
Paper
Accepted
Refereed?: Yes, Invited?: No
10. Alaa Oqaily*, Sudershan Lakshmanan Thirunavukkarasu*, Yosr Jarraya, Suryadipta Majumdar, Mengyuan Zhang, Makan Pourzandi, Lingyu Wang, Mourad Debbabi. (2020). NFVGuard: Verifying the Security of Multilevel Network Functions Virtualization (NFV) Stack. Proceedings of the 12th IEEE International Conference on Cloud Computing Technology and Science (CloudCom 2020),
Paper
Accepted
Refereed?: Yes, Invited?: No
11. Meisam Mohammady*, Shangyu Xie, Yuan Hong, Mengyuan Zhang, Lingyu Wang, Makan Pourzandi and Mourad Debbabi. (2020). R²DP: A Universal and Automated Approach to Optimizing the Randomization Mechanisms of Differential Privacy for Utility Metrics with No Known Optimal Distributions. Proceedings of the 27th ACM Conference on Computer and Communications Security (CCS 2020) (Acceptance ratio 121/715≈16.9%),
Paper
Accepted
Refereed?: Yes, Invited?: No

12. Sudershan Lakshmanan Thirunavukkarasu*, Mengyuan Zhang, Alaa Oqaily*, Gagandeep Singh Chawla*, Lingyu Wang, Makan Pourzandi and Mourad Debbabi. (2019). Modeling NFV Deployment to Identify the Cross-level Inconsistency Vulnerabilities. Proc. The 11th IEEE International Conference and on Cloud Computing Technology and Science (CloudCom 2019),
Paper
Accepted
Refereed?: Yes, Invited?: No
13. Momen Oqaily*, Yosr Jarraya, Mengyuan Zhang*, Lingyu Wang, Makan Pourzandi and Mourad Debbabi. (2019). iCAT: An Interactive Customizable Anonymization Tool. Proc. the 24th European Symposium on Research in Computer Security (ESORICS 2019) (Acceptance ratio 67/344≈19.5%),
Paper
Accepted
Refereed?: Yes, Invited?: No
14. Mengyuan Zhang*, Yue Xin*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2019). CASFinder: Detecting Common Attack Surface. Proc. 33rd Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSec 2019) (Best Paper Award),
Paper
Accepted
Refereed?: Yes, Invited?: No
15. Suryadipta Majumdar*, Azadeh Tabiban*, Meisam Mohammady*, Alaa Oqaily*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Proactivizer: Transforming Existing Verification Tools into Efficient Solutions for Runtime Security Enforcement. Proc. the 24th European Symposium on Research in Computer Security (ESORICS 2019) (Acceptance ratio 67/344≈19.5%),
Paper
Accepted
Refereed?: Yes, Invited?: No
16. Suryadipta Majumdar, Azadeh Tabiban*, Meisam Mohammady*, Alaa Oqaily*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2019). Multi-Level Proactive Security Auditing for Cloud. Proc. the IEEE Conference on Dependable and Secure Computing (DSC 2019),
Paper
Accepted
Refereed?: Yes, Invited?: No
17. Onur Duman*, Mohsen Ghafouri, Marthe Kassouf, Ribal Atallah, Lingyu Wang, Mourad Debbabi. (2019). Modeling Supply Chain Attacks in IEC 61850 Substations. Proc. the 2019 IEEE International Conference on Smart Grid Communications (SmartGridComm 2019),
Paper
Accepted
Refereed?: Yes, Invited?: No
18. Saed Alrabaei*, El Mouatez Karbab, Lingyu Wang and Mourad Debbabi. (2019). BinEye: Towards Efficient Binary Authorship Characterization Using Deep Learning. Proc. the 24th European Symposium on Research in Computer Security (ESORICS 2019) (Acceptance ratio 67/344≈19.5%),
Paper
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19. Taous Madi*, Mengyuan Zhang*, Yosr Jarrayay, Amir Alimohammadifar*, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). QuantiC: Distance Metrics for Evaluating Multi-tenancy Threats in Software Defined Networking (SDN)-Based Cloud. The 10th IEEE International Conference and on Cloud Computing Technology and Science (CloudCom 2018) (Acceptance ratio 18/91≈20%),
Paper
Published
Refereed?: Yes, Invited?: No
20. Amir Alimohammadifar*, Suryadipta Majumdar*, Taous Madi*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2018). Stealthy Probing-based Verification (SPV): An Active Approach to Defending Software Defined Networks against Topology Poisoning Attacks. the 23rd European Symposium on Research in Computer Security (ESORICS 2018) (Acceptance ratio 56/283≈20%),
Paper
Published
Refereed?: Yes, Invited?: No
21. Paria Shirani*, Leo Collard, Basile L. Agba, Bernard Lebel, Mourad Debbabi, Lingyu Wang, Aiman Hanna. (2018). Scalable Approach to Detecting Vulnerable Functions in Firmware Images of Smart Grid IEDs. the 15th Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA 2018) (Acceptance ratio 18/59≈31%),
Paper
Published
Refereed?: Yes, Invited?: No
22. Azadeh Tabiban*, Suryadipta Majumdar*, Lingyu Wang and Mourad Debbabi. (2018). PERMON: An OpenStack Middleware for Runtime Security Policy Enforcement in Clouds. the 4th IEEE Workshop on Security and Privacy in the Cloud (SPC 2018),
Paper
Published
Refereed?: Yes, Invited?: No
23. Saed Alrabaee*, Paria Shirani*, Lingyu Wang, Mourad Debbabi and Aiman Hanna. (2018). On Leveraging Coding Habits for Effective Binary Authorship Attribution. the 23rd European Symposium on Research in Computer Security (ESORICS 2018) (Acceptance ratio 56/283≈20%),
Paper
Published
Refereed?: Yes, Invited?: No
24. Meisam Mohammady*, Lingyu Wang, Yuan Hong, Habib Louafi, Makan Pourzandi and Mourad Debbabi. (2018). Preserving Both Privacy and Utility in Network Trace Anonymization. the 25th ACM Conference on Computer and Communications Security (CCS 2018) (Acceptance ratio 134/809≈17%),
Paper
Published
Refereed?: Yes, Invited?: No
25. Nawaf Alhebaishi*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2018). Modeling and Mitigating the Insider Threat of Remote Administrators in Clouds. 32nd Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC 2018) (Best Student Paper Award),
Paper
Published
Refereed?: Yes, Invited?: No

26. Onur Duman*, Mengyuan Zhang*, Lingyu Wang, Mourad Debbabi. (2017). Measuring the Security Posture of IEC 61850 Substations with Redundancy Against Zero Day Attacks. IEEE International Conference on Smart Grid Communications (SmartGridComm 2018),
Paper
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Refereed?: Yes, Invited?: No
27. Yushun Wang*, Taous Madi*, Suryadipta Majumdar*, Yosr Jarraya, Amir Alimohammadifar*, Makan Pourzandi, Lingyu Wang, Mourad Debbabi. (2017). TenantGuard: Scalable Runtime Verification of Cloud-Wide VM-Level Network Isolation. Proc. The Network and Distributed System Security Symposium (NDSS 2017) (Acceptance ratio 68/423≈16%),
Paper
Published
Refereed?: Yes, Invited?: No
28. Paria Shirani*, Lingyu Wang, Mourad Debbabi. (2017). BinShape: Scalable and Robust Binary Library Function Identification Using Diverse Features. 14th Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA 2017) (Acceptance ratio 18/67≈27%),
Paper
Published
Refereed?: Yes, Invited?: No
29. Suryadipta Majumdar*, Yosr Jarraya, Momen Oqaily*, Amir Alimohammadifar*, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2017). LeaPS: Learning-Based Proactive Security Auditing for Clouds. 22nd European Symposium on Research in Computer Security (ESORICS 2017) (Acceptance ratio 54/340≈16%),
Paper
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Refereed?: Yes, Invited?: No
30. Daniel Borbor*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2017). Securing Networks against Unpatchable and Unknown Vulnerabilities Using Heterogeneous Hardening Options. 31st Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC 2017),
Paper
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Refereed?: Yes, Invited?: No
31. Saed Alrabaee*, Paria Shirani*, Mourad Debbabi and Lingyu Wang. (2016). On the Feasibility of Malware Authorship Attribution. The 9th International Symposium on Foundations & Practice of Security (FPS 2016),
Paper
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Refereed?: Yes, Invited?: No
32. Nawaf Alhebaishi*, Lingyu Wang, Sushil Jajodia and Anoop Singhal. (2016). Threat Modeling for Cloud Data Center Infrastructures. The 9th International Symposium on Foundations & Practice of Security (FPS 2016),
Paper
Published
Refereed?: Yes, Invited?: No
33. Mickael Emirkanian-Bouchard* and Lingyu Wang. (2016). Towards Metric-Driven, Application-Specific Visualization of Attack Graphs. The 9th International Symposium on Foundations & Practice of Security (FPS 2016),
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34. Suryadipta Majumdar*, Yosr Jarraya, Taous Madi, Amir Alimohammadifar*, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2016). Proactive Verification of Security Compliance for Clouds through Pre-Computation: Application to OpenStack. the 21st European Symposium on Research in Computer Security (ESORICS 2016) (Acceptance ratio 60/285≈21%),
Conference Date: 2016/9
Paper
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Refereed?: Yes, Invited?: No
35. Daniel Borbor*, Lingyu Wang, Sushil Jajodia and Anoop Singha. (2016). Diversifying Network Services under Cost Constraints for Better Resilience against Unknown Attacks. 30th Annual IFIP WG 11.3 Working Conference on Data and Applications Security (DBSEC 2016),
Conference Date: 2016/7
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Refereed?: Yes, Invited?: No
36. Taous Madi*, Suryadipta Majumdar*, Yushun Wang*, Yosr Jarraya, Makan Pourzandi, Lingyu Wang and Mourad Debbabi. (2016). Auditing Security Compliance of the Virtualized Infrastructure in the Cloud: Application to OpenStack. The 6th ACM Conference on Data and Application Security and Privacy (CODASPY 2016) (Acceptance ratio 22/115≈19%),
Conference Date: 2016/3
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Patents

1. Data Anonymization Views. United States of America. PCT/IB2020/054045. 2019/04/08.
Patent Status: Pending
Inventors: Momen Oqaily*, Lingyu Wang, Makan Pourzandi, Yosr Jarraya, Mengyuan Zhang, Mourad Debbabi
2. Utility Optimized Differential Privacy System. United States of America. PCT/IB2020/054541. 2019/03/13.
Patent Status: Pending
Inventors: Meisam Mohammady*, Lingyu Wang, Makan Pourzandi, Shangyu Xie, Yuan Hong, Yosr Jarraya, Mengyuan Zhang, Mourad Debbabi,
3. Apparatus and Method for Evaluating Multiple Aspects of The Security for Virtualized Infrastructure in a Cloud Environment. United States of America. PCT/IB2019/053352. 2018/03/29.
Patent Status: Pending
Inventors: Taous Madi*, Lingyu Wang, Makan Pourzandi, Yosr Jarraya, Mengyuan Zhang, Mourad Debbabi
4. Partition-Based Prefix Preserving Anonymization Approach For Network Traces In The Cloud. United States of America. PCT/IB2018/051293. 2018/03/01.
Patent Status: Pending
Inventors: Meisam Mohammady*, Lingyu Wang, Makan Pourzandi, Yosr Jarraya, Mourad Debbabi
5. Privacy-Preserving Data Verification. United States of America. PCT/IB2018/051288. 2018/03/01.
Patent Status: Pending
Inventors: Momen Oqaily*, Lingyu Wang, Makan Pourzandi, Yosr Jarraya, Mourad Debbabi
6. Network Link Verification. United States of America. PCT/IB2018/059632. 2017/10/27.
Patent Status: Pending
Inventors: Amir Alimohammadifar*, Lingyu Wang, Makan Pourzandi, Yosr Jarraya, Mourad Debbabi

7. K-zero Day Safety. United States of America. 8,918,884.
Patent Status: Granted/Issued
Year Issued: 2014
Inventors: Sushil Jajodia, Lingyu Wang, Steven Noel, Anoop Singhal
8. Interactive Analysis of Attack Graphs Using Relational Queries. United States of America. 8,566,269.
Patent Status: Granted/Issued
Year Issued: 2013
Inventors: Sushil Jajodia, Lingyu Wang, Anoop Singhal,



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Professor Jun Yan

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
Chinese	Yes	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	Yes	Yes

Degrees

- 2017/8 Doctorate, Electrical Engineering, University of Rhode Island
Supervisors: Haibo He, 2013/9 - 2017/8
- 2013/5 Master's Thesis, Electrical Engineering, University of Rhode Island
Supervisors: Haibo He, 2011/9 - 2013/5
- 2011/6 Bachelor's, Information and Communication Engineering, Zhejiang University
Supervisors: Zhiyu Xiang, 2011/2 - 2011/6

Recognitions

- 2018/5 Excellence in Doctoral Research Award - 1,000
University of Rhode Island
Prize / Award
I was the sole recipient of this award in 2018, which recognizes the excellence of dissertation research among doctoral graduates across every discipline this year.
- 2017/1 Best Reviewers
IEEE Transactions on Smart Grid
Citation
I was selected as one of the 49 Best Reviewers in 2016 for IEEE Transactions on Smart Grid

User Profile

Research Specialization Keywords: Security and resiliency, Situational awareness, Smart grids, Vulnerability assessment, Applied computational intelligence, Cyber-physical security, Fault diagnosis, Machine learning, Microgrids, Renewable energy management, Adaptive control, Risk assessment, Smart cities

Employment

- 2023/7 Concordia University Research Chair (Tier II) in Artificial Intelligence in Cyber Security and Resilience
 Concordia Institute for Information Systems Engineering, Concordia University
 Full-time, Associate Professor
 Tenure Status: Tenure
 Conducting research on artificial intelligence as tools, targets, and threats in cyber security and resiliency.
- 2023/7 Graduate Program Director (Thesis-Based)
 Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science, Concordia University
 Full-time, Associate Professor
 Tenure Status: Tenure
 Directing the thesis-based graduate program for Master's and Doctoral students.
- 2022/6 Associate Professor
 Concordia Institute for Information Systems Engineering, Gina Cody School of Engineering and Computer Science, Concordia University
 Full-time, Associate Professor
 Tenure Status: Tenure
 (After early promotion) Performing research, teaching, and service with the area of expertise in smart grid security, cyber-physical systems, smart infrastructures and intelligent systems.
- 2017/12 - 2022/5 Assistant Professor
 Concordia Institute for Information Systems Engineering, Faculty of Engineering and Computer Science, Concordia University
 Full-time, Assistant Professor
 Tenure Status: Tenure Track
 Performing research, teaching, and service with the area of expertise in smart grid security, cyber-physical systems, smart infrastructures and intelligent systems.
- 2016/1 - 2017/12 Assistant to the Editor-in-Chief
 Editorial Office, IEEE Transactions on Neural Networks and Learning Systems
 Part-time
 Tenure Status: Non Tenure Track
 In charge of manuscript management, email communication, event coordination, and other administrative responsibilities.

Research Funding History

Awarded [n=7]

- 2023/6 - 2028/5 Concordia University Research Chair (Tier II) in Artificial Intelligence in Cyber Security and Resilience, Research Chair
 Principal Investigator
Funding Sources:
 Concordia University
 Concordia University Research Chair
 Total Funding - 160,000
 Portion of Funding Received - 160,000
 Funding Competitive?: Yes
- 2023/9 - 2026/8 Evidence-based monitoring of construction projects through effective, reliable, and credible RFI analysis and management, Grant
 Co-investigator

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)
 NSERC Alliance-Mitacs Accelerate
 Total Funding - 484,000
 Portion of Funding Received - 220,000
 Funding Competitive?: Yes
 CREO Solutions
 NSERC Alliance-Mitacs Accelerate
 Total Funding - 411,675
 Portion of Funding Received - 180,000
 Funding Competitive?: Yes
 Natural Sciences and Engineering Research Council of Canada (NSERC)
 NSERC Alliance-Mitacs Accelerate
 Total Funding - 823,350
 Portion of Funding Received - 184,000
 Funding Competitive?: Yes

Co-investigator : Hua Ge; Mazdak Nik-Bakht;

Principal Investigator : Yong Zeng

2024/1 - 2025/12
 Principal Investigator Global Centers Track 2: Equitable and User-Centric Energy Market for Resilient Grid-interactive Communities, Grant

Funding Sources:

National Science Foundation (USA)
 Global Centers
 Total Funding - 250,000
 Portion of Funding Received - 0
 Funding Competitive?: Yes

Co-investigator : Hohyun Lee; Mohsen Ghafouri; Yi Fang;

Principal Investigator : Yuhong Liu

2020/12 - 2025/12
 Co-investigator Toward Intelligent and Resilient Smart Cities with Energy-Vehicle-Human Interactions, Grant

Funding Sources:

Canada Foundation for Innovation (CFI)
 CFI Innovation Fund
 Total Funding - 723,417
 Portion of Funding Received - 341,646
 Funding Competitive?: Yes
 Concordia University and Other Partners
 CFI Innovation Fund (Other Matching)
 Total Funding - 361,709
 Portion of Funding Received - 170,823
 Funding Competitive?: Yes
 Government of Quebec
 CFI Innovation Fund (Provincial Matching)
 Total Funding - 723,417
 Portion of Funding Received - 341,646
 Funding Competitive?: Yes

Co-investigator : Arash Mohammadi; Mohsen Ghafouri; Mourad Debbabi; Walter Lucia;

Principal Investigator : Chadi Assi

2018/4 - 2024/3
 Cyber-Physical Security for Critical Internet-of-Things Infrastructures, Grant

Principal Investigator	Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Total Funding - 180,500 Portion of Funding Received - 180,500 Funding Competitive?: Yes
2023/5 - 2023/11 Co-investigator	From meal planning to grocery shopping cart; a smart software platform combining personalized recommendations, grocery shopping, and healthy-eating-behavior building, Grant Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Mitacs Accelerate Total Funding - 30,000 Portion of Funding Received - 10,000 Funding Competitive?: No 7dish Mitacs Accelerate Total Funding - 30,000 Portion of Funding Received - 10,000 Funding Competitive?: No Co-investigator : Yong Zeng; Principal Investigator : Chun Wang
2020/7 - 2023/6 Co-investigator	AI+ Gestion des déchets et des ressources pour une ville durable, Grant Funding Sources: Fonds de recherche du Québec - Société et culture (FRQSC) NSFC - FRQSC – Programme de recherche sur les villes intelligentes et les mégadonnées Total Funding - 120,000 Portion of Funding Received - 45,000 Funding Competitive?: Yes National Natural Science Foundation of China (NSFC) NSFC - FRQSC – Programme de recherche sur les villes intelligentes et les mégadonnées Total Funding - 2,000,000 Portion of Funding Received - 0 Funding Competitive?: Yes Co-applicant : Nadia Bhuiyan; Principal Investigator : Yong Zeng
Completed [n=13]	
2020/1 - 2023/8 Principal Investigator	Intelligent Cyber-Physical Situational Awareness for Smart Infrastructures, Grant Funding Sources: Ericsson Communication Inc. Total Funding - 84,000 Portion of Funding Received - 84,000 Funding Competitive?: Yes Mathematics of Information Technology and Complex Systems (MITACS) Total Funding - 102,666 Portion of Funding Received - 102,666 Funding Competitive?: Yes
2020/1 - 2022/12	Self-Adaptive Penetration Tests with Deep-Reinforced Intelligent Agents, Grant

Principal Applicant	<p>Funding Sources: Ericsson Communication Inc. Total Funding - 42,000 Portion of Funding Received - 42,000 Funding Competitive?: Yes Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Cluster Total Funding - 51,333 Portion of Funding Received - 51,333 Funding Competitive?: Yes</p>
2022/5 - 2022/10 Principal Investigator	<p>Deep Learning for Cyber-Physical System Security in A Smarter World, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Total Funding - 30,000 Portion of Funding Received - 30,000 Funding Competitive?: Yes</p>
2020/1 - 2021/11 Principal Applicant	<p>Transparent and Trustworthy Deep Feature Learning for Cyber-Physical System Security, Grant</p> <p>Funding Sources: Mathematics of Information Technology and Complex Systems (MITACS) Accelerate Cluster Total Funding - 29,333 Portion of Funding Received - 29,333 Funding Competitive?: Yes Ericsson Communication Inc. Total Funding - 24,000 Portion of Funding Received - 24,000 Funding Competitive?: Yes</p>
2018/9 - 2020/8 Co-investigator	<p>Proactive Security for Attack-Resilient Microgrids: Detection, Mitigation and Recovery, Grant</p> <p>Funding Sources: Concordia University Horizon Postdoctoral Fellowships Total Funding - 95,000 Portion of Funding Received - 95,000 Funding Competitive?: Yes</p> <p>Principal Investigator : Mourad Debbabi</p>
2017/12 - 2020/4 Principal Investigator	<p>Spatial-Temporal Analytics for Data-Intensive Situational Awareness in Smart Grids, Grant</p> <p>Funding Sources: Concordia University Start-Up Grant Total Funding - 50,000 Portion of Funding Received - 50,000 Funding Competitive?: No</p>
2018/4 - 2020/3 Principal Investigator	<p>Feature Learning for Automatic and Adaptive Security of Smart Grid, Grant</p> <p>Funding Sources: Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) Établissement de nouveaux chercheurs universitaires Total Funding - 50,800</p>

- Portion of Funding Received - 50,800
Funding Competitive?: Yes
- 2018/10 - 2019/9
Principal Investigator Aid to the 11th International Symposium on Foundations & Practices of Security (FPS 2018), Grant
- Funding Sources:**
Concordia University
Aid to Research- Related Events
Total Funding - 7,500
Portion of Funding Received - 7,500
Funding Competitive?: Yes
- Co-investigator : Mourad Debbabi
- 2018/12 - 2019/8
Principal Investigator Deep Learning for Cyber-Physical Security in the Smarter World, Grant
- Funding Sources:**
Mathematics of Information Technology and Complex Systems (MITACS)
Globalink Research Internship
Total Funding - 30,000
Portion of Funding Received - 30,000
Funding Competitive?: Yes
- 2018/4 - 2019/4
Principal Investigator Spatial-Temporal Analytics for Data-Intensive Situational Awareness in Smart Grids, Grant
- Funding Sources:**
Nvidia
GPU Grant
Total Funding - 1,500
Portion of Funding Received - 1,500
Funding Competitive?: Yes
- 2018/3 - 2019/3
Co-investigator STARTBASE-I: Integrated Smart Microgrids and Autonomous Vehicles Research TestBed for Smart Connected Communities, Grant
- Funding Sources:**
Concordia University
ENCS - Capital Research Innovation Funds
Total Funding - 100,000
Portion of Funding Received - 57,725
Funding Competitive?: Yes
- Principal Investigator : Arash Mohammadi
- 2018/3 - 2019/3
Co-investigator Intelligent Control, Diagnosis, and Security of Smart Grid Networks, Grant
- Funding Sources:**
Concordia University
ENCS - Capital Research Innovation Funds
Total Funding - 100,000
Portion of Funding Received - 3,300
Funding Competitive?: Yes
- Principal Investigator : Kash Khorasani
- 2016/12 - 2017/6
Principal Investigator Towards a Resilient Smart Grid against Informed False Data Injection Attacks, Grant
- Funding Sources:**
University of Rhode Island (URI)
Enhancement of Graduate Research Award
Total Funding - 670
Portion of Funding Received - 670

Funding Competitive?: Yes

Student/Postdoctoral Supervision

Bachelor's [n=9]

2023/5 - 2023/8 Principal Supervisor	Dohva, Anna (Completed) , V. N. Karazin Kharkiv National University (Ukraine) Thesis/Project Title: Social impact of AI in security management and policy (Mitacs Globalink Research Intern) Present Position: Graduate Student, Swiss Federal Institute of Technology
2023/5 - 2023/8 Principal Supervisor	Sanchez, Héctor (Completed) , Universidad Veracruzana (Mexico) Thesis/Project Title: Security of deep learning applications in industrial IoT (Mitacs Globalink Research Intern) Present Position: Student, Universidad Veracruzana (Mexico)
2023/2 - 2023/8 Principal Supervisor	Benoit, Ludjina (Completed) , Concordia University Thesis/Project Title: VINCheck: Vulnerable Inconsistencies in Developing Free Open-Source Software for Machine Learning (NSERC USRA Intern) Present Position: Student, Concordia University
2023/2 - 2023/8 Principal Supervisor	Darabi, Mohammad-Hossien (Completed) , Concordia University Thesis/Project Title: iScope: A Self-Adaptive Network Telescope to Monitor Unsolicited IoT Connections in the Wild (NSERC USRA Intern) Present Position: Student, Concordia University
2022/5 - 2022/11 Principal Supervisor	Qiao, Mohan (Completed) , McGill University Thesis/Project Title: Industrial IoT security testbed and dataset development Present Position: Research assistant, Concordia University
2022/5 - 2022/8 Principal Supervisor	Singhal, Rishi (Completed) , Indraprastha Institute of Information Technology - Delhi (India) Thesis/Project Title: Automating intrusion detection in critical infrastructures (Mitacs Globalink Research Intern) Present Position: MSc student, North Carolina State University (USA)
2022/5 - 2022/8 Principal Supervisor	Tang, Zixin (Completed) , Nanjing University of Posts and Telecommunications (China) Thesis/Project Title: Graph neural network for industrial IoT anomaly detection (Mitacs Globalink Research Intern) Present Position: Student, ShanghaiTech University (China)
2019/5 - 2019/8 Principal Supervisor	Tan, Jieyuan (Completed) , Zhejiang University (China) Thesis/Project Title: Reinforcement learning in security automation Present Position: PhD student, Hong Kong University of Science and Technology (China)
2019/5 - 2019/8 Principal Supervisor	Kluban, Maryna (Completed) , Taras Shevchenko National University of Kyiv (Ukraine) Thesis/Project Title: Autoencoder techniques for intrusion detection (Mitacs Globalink Research Intern) Present Position: MASc student, Concordia University

Master's Equivalent [n=1]

2019/8 - 2019/8 Principal Supervisor	Yao, Jinli (Completed) , Shandong University of Finance and Economics (China) Thesis/Project Title: Explaining AI-generated decisions in security monitoring Present Position: PhD student, Concordia University
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Master's Thesis [n=12]

2023/5 - 2025/4 Co-Supervisor	Prithviraj Savant, Shreya (In Progress) , Concordia University Thesis/Project Title: From meal planning to grocery shopping cart; a smart software platform combining personalized recommendations, grocery shopping, and healthy-eating-behavior Present Position: Student, Concordia University
2023/5 - 2025/4 Co-Supervisor	Kumar Rengarajan, Nanda (In Progress) , Concordia University Thesis/Project Title: From meal planning to grocery shopping cart; a smart software platform combining personalized recommendations, grocery shopping, and healthy-eating-behavior Present Position: Student, Concordia University
2023/1 - 2024/12 Principal Supervisor	Dai, Hanzheng (In Progress) , Concordia University Thesis/Project Title: Applied Machine Learning for Cyber-Physical Security of the Smart Grid Present Position: Student
2023/1 - 2024/12 Principal Supervisor	Pasha Shabanfar, Mohammad (In Progress) , Concordia University Thesis/Project Title: Attack Modelling and Data Synthesis for Applied Artificial Intelligence in Cyber-Physical Security of Smart Grids Present Position: Student
2022/9 - 2024/8 Principal Supervisor	Ahmadinasab, Sareh (In Progress) , Concordia University Thesis/Project Title: Intelligent root cause analysis, critical anomaly prediction and digital evidence representation for project management Present Position: Student
2021/6 - 2023/5 Principal Supervisor	Frandon, Jeremy (Completed) , Concordia University Thesis/Project Title: Intelligent Cyber-Physical Situational Awareness for Smart Infrastructures Present Position: PhD Student, Concordia University
2021/1 - 2023/5 Co-Supervisor	Li, Shun (Completed) , Concordia University Thesis/Project Title: UAV-based Forest Wildfire Detection and Monitoring Present Position: Student, Chinese Academy of Science
2020/1 - 2022/12 Principal Supervisor	Liao, Pengyi (Completed) , Concordia University Thesis/Project Title: A Transfer Learning Framework for Self-Adaptive Intrusion Detection in the Smart Grid based on Transferability Analysis and Domain-Adversarial Training Present Position: Associate Researcher, Huawei Technologies (Canada)
2019/5 - 2020/12 Principal Supervisor	Varo, Quentin (Completed) , Concordia University Thesis/Project Title: Dynamic Reduced-Round TLS Extension for Secure Wireless Communication of IoT Devices Present Position: Chief Information Security Officer, Pineappli, Monaco
2019/5 - 2020/12 Principal Supervisor	Lardier, William (Completed) , Concordia University Thesis/Project Title: ASGARDS-H: Enabling Advanced Smart Grid cyber-physical Attacks, Risk and Data Studies with HELICS Present Position: Software Engineer, Scalify, France
2019/1 - 2020/12 Principal Supervisor	Zhang, Yongxuan (Completed) , Concordia University Thesis/Project Title: Domain Adversarial Transfer Learning for Robust Cyber-Physical Attack Detection in the Smart Grid Present Position: Software Development Engineer, Google (Canada)

2018/1 - 2019/8
Principal Supervisor
Hu, Chengming (Completed) , Concordia University
Thesis/Project Title: Ensemble Feature Learning-Based Event Classification for Cyber-Physical Security of the Smart Grid
Present Position: PhD Student, McGill University

Doctorate [n=11]

2023/9 - 2027/8
Co-Supervisor
Haghjoo, Yasaman (In Progress) , Concordia University
Thesis/Project Title: Secure and Resilient Electricity Market Operations in the Internet of Energy
Present Position: Student

2023/6 - 2027/5
Co-Supervisor
Frandon, Jeremy (In Progress) , Concordia University
Thesis/Project Title: Advanced cyber security analysis and threat hunting
Present Position: Student

2023/5 - 2027/4
Academic Advisor
Lubbos, Fadel (In Progress) , Concordia University
Thesis/Project Title: Secure cloud architecture for next generation operational technologies in grid-interactive communities
Present Position: Student

2022/10 - 2026/12
Principal Supervisor
Al Shami, Maryam (In Progress) , Concordia University
Thesis/Project Title: Critical anomaly detection with visual-causal and data-driven analysis for industrial systems and processes
Present Position: Student

2021/9 - 2025/8
Co-Supervisor
Jafarpour, Hamed (In Progress) , Concordia University
Thesis/Project Title: Computational linguistics for AI-aided adverse event detection and diagnosis
Present Position: Student

2020/1 - 2024/5
Principal Supervisor
Du, Hang (In Progress) , Concordia University
Thesis/Project Title: Cyber-Physical Security for Renewable Energy Systems in the Smart Grid
Present Position: Student

2020/1 - 2024/5
Principal Supervisor
Chen, Juanwei (In Progress) , Concordia University
Thesis/Project Title: Cyber-Physical Security for Distributed Energy Resource Systems and Virtual Power Plants in the Smart Grid
Present Position: Student

2019/9 - 2024/8
Co-Supervisor
Hu, Chengming (In Progress) , McGill University
Thesis/Project Title: Self-Adaptive Intrusion Detection for Dynamic Cyber-Physical Systems
Present Position: Student

2019/9 - 2023/12
Principal Supervisor
Li, Yuanliang (In Progress) , Concordia University
Thesis/Project Title: Self-Adaptive Penetration Testing for Cyber-Physical Systems in the Smart Grid
Present Position: Student

2018/10 - 2020/11
Co-Supervisor
Hou, Luyang (Completed) , Concordia University
Thesis/Project Title: Advanced Mechanism Design for Electric Vehicle Charging Scheduling in the Smart Infrastructure
Present Position: Research Associate Professor, Beijing University of Posts and Telecommunications (China)

2018/9 - 2023/8
Principal Supervisor Rahman, Moshfeka (In Progress) , Concordia University
Thesis/Project Title: Applied Artificial Intelligence for Smart Grid Security: Vulnerabilities, Attacks and Defense
Present Position: Student

Post-doctorate [n=4]

2022/1 - 2022/12
Principal Supervisor Hou, Luyang (Completed) , Concordia University
Thesis/Project Title: Transactive energy with packetized energy and blockchains
Present Position: Research Associate Professor, Beijing University of Posts and Telecommunications (China)

2021/3 - 2023/5
Co-Supervisor Soeanu, Andrei (In Progress) , Concordia University
Thesis/Project Title: Proactive Security for Attack-Resilient Microgrids and Automated Threat Intelligence
Present Position: Post-doctoral fellow, Concordia University

2018/9 - 2019/8
Co-Supervisor Ghafouri, Mohsen (Completed) , Concordia University
Thesis/Project Title: Proactive Security for Attack-Resilient Microgrids: Detection, Mitigation and Recovery
Present Position: Assistant Professor, Concordia University

2018/8 - 2019/7
Principal Supervisor Li, Zhenxing (Completed) , Linyi University (China)
Thesis/Project Title: Multi-agent system-based control for smart grid
Present Position: Professor, Linyi University

Event Administration

2023/2 - 2023/10
Local Organization Chair, 7th IEEE Cyber Security in Networking Conference, Conference, 2023/10 - 2023/10

2019/9 - 2020/8
Technical Program Chair, 2020 IEEE Power and Energy Society General Meeting (PESGM 2020), Conference, 2020/8 - 2020/8

2019/1 - 2019/4
Local Organization Chair, 2019 Cyber-Physical Systems and Internet-of-Things Week, Conference, 2019/4 - 2019/4

2018/8 - 2018/11
Local Organization Chair, The 11th International Symposium on Foundations & Practice of Security (FPS 2018), Conference, 2018/11 - 2018/11

Editorial Activities

2022/8 - 2023/7
Associate Editor, Complex & Intelligent Systems (Springer), Journal

2022/5 - 2023/4
Associate Editor, IET Energy Conversion and Economics, Journal

2016/1 - 2018/6
Assistant to the Editor-in-Chief, IEEE Transactions on Neural Networks and Learning Systems, Journal

Knowledge and Technology Translation

2019/12 - 2023/5 Inventor, R&D Collaboration with Industry
 Group/Organization/Business Serviced: Ericsson Global AI Accelerator (GAIA)
 Target Stakeholder: Industry/Business (>500 employees)
 Outcome / Deliverable: 5 research articles (2 journal, 2 conference and 1 submitted), 3 MASC thesis, and 2 patents (1 pending and 1 being prepared).
 Activity Description: Joint R&D in three Mitacs Accelerate projects of 25 internship units over 3 years (value: CAD 333,333) with Ericsson GAIA Montreal.

International Collaboration Activities

2022/8 - 2023/8 Co-investigator, United States of America
 Joint recipient of the IEEE Blockchain-Enabled Transactive Energy (BCTE) Demonstration project on Demonstration of A Blockchain-Facilitated Packetized Energy Trading Market. An open-source co-simulation platform has been developed jointly from the project with Santa Clara University, USA. It provided a platform for a joint proposal for the NSF-NSERC Global Center awarded to both SCU and Concordia in August 2023.

2020/7 - 2023/6 Co-Principal Investigator, China
 Quebec co-lead of the project "AI+ Gestion des déchets et des ressources pour une ville durable" sponsored by the National Natural Science Foundation of China (NSFC) - Fonds de recherche du Québec – Société et culture (FRQSC) Research Program on Smart Cities and Big Data. Responsible of data analysis for policy evaluation and recommendation in urban solid waste management for sustainable smart cities.

Committee Memberships

2019/3 Committee Member, 2019 International Conference on High Performance Big Data and Intelligent Systems, IEEE Computer Society
 Serving as the TPC member for the conference technically co-sponsored by IEEE Computer Society

2018/10 Committee Member, 2019 IEEE Congress on Evolutionary Computation (CEC), IEEE Computational Intelligence Society
 Serving as the TPC member for the Special Session on Computational Intelligence for Cybersecurity

Presentations

1. (2023). Applied Artificial Intelligence for Smart Grid Security. Invited Seminar at Monash University, Melbourne, VIC, Australia
 Main Audience: Researcher
 Invited?: Yes, Keynote?: No
2. (2023). The Role of Artificial Intelligence in Smart Grid Security. Invited Seminar at Clarkson University, Potsdam, NY, United States of America
 Invited?: Yes, Keynote?: No
3. (2023). AI-based Smart Technologies in Smart Grid Security. Invited Virtual Seminar at the University of Delaware, United States of America
 Invited?: Yes, Keynote?: No

4. (2022). Machine Learning for Secure and Resilient Cyber-Physical Systems: Lessons Learned and Solutions Ahead from the Smart Grid. Ericsson Global AI Accelerator (GAIA) Thursday Invited Talk Series, Montreal, Canada
Main Audience: Knowledge User
Invited?: Yes, Keynote?: No
5. (2022). Applied Machine Learning for Smart Grids Through the Lens of Security and Resiliency. Workshop on cyber-physical security of the smart grid, Cozenza, Italy
Main Audience: Researcher
Invited?: Yes, Keynote?: No
6. (2021). Computing Security, Trust and Privacy in a Hyperconnected World. APSIPA U.S. Local Chapter Panel 2021, Kingston, United States of America
Invited?: Yes, Keynote?: No
7. (2020). Cybersecurity in Grid Modernization: Opportunities and Challenges for Machine Learning. IEEE Power and Energy Society (PES) General Meeting, Montreal, Canada
Invited?: No, Keynote?: No
8. (2019). Demand Aware Deployment and Expansion Method for an Electric Vehicles Fast Charging Network. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Main Audience: Researcher
Invited?: No, Keynote?: No
9. (2019). Quantum-Sim: An Open-Source Co-Simulation Platform for Quantum Key Distribution-Based Smart Grid Communications. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Main Audience: Researcher
Invited?: No, Keynote?: No
10. (2019). Domain-Adversarial Transfer Learning for Robust Intrusion Detection in the Smart Grid. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Main Audience: Researcher
Invited?: No, Keynote?: No
11. (2018). Deep Learning-Aided Cyber-Attack Detection in Power Transmission Systems. IEEE Power and Energy Society (PES) General Meeting, Portland, United States of America
Main Audience: Knowledge User
Invited?: No, Keynote?: No

Text Interviews

2024/01/24	Offshore wind farms are vulnerable to cyberattacks, new Concordia study shows, Concordia News: https://www.concordia.ca/news/stories/2024/01/24/offshore-wind-farms-are-vulnerable-to-cyberattacks-new-concordia-study-shows.html
2022/11/30	Smart inverters' vulnerability to cyberattacks needs to be identified and countered, according to Concordia researchers, Concordia News: https://www.concordia.ca/news/stories/2022/11/29/smart-inverters-vulnerability-to-cyberattacks-needs-to-be-identified-and-counterred-according-to-concordia-researchers.html
2018/06/20	Engineering Student Wins URI Excellence in Doctoral Research Award, URI College of Engineering Website

Publications

Journal Articles

1. Du, H*; Yan, J; Ghafouri, M; Zgheib, R; Debbabi, M. (2024). Modeling and Assessment of Cyber Attacks Targeting Converter-Driven Stability of Power Grids with PMSG-Based Wind Farms. IEEE Transactions on Power Systems.
In Press
Refereed?: Yes
2. Mu, C; Liu, Z; Yan, J; Jia, H, Zhang, X. (2024). Graph Multi-Agent Reinforcement Learning for Inverter-Based Active Voltage Control. IEEE Transactions on Smart Grid. 15(2): 1399-1409.
Published
Refereed?: Yes
3. Rahman, M*; Yan, J; Thepie-Fapi, E. (2024). Adversarial Artificial Intelligence in Blind False Data Injection in Smart Grid AC State Estimation. IEEE Transactions on Industrial Informatics.
In Press
Refereed?: Yes
4. Cheng, G*; Lin, Y; Yan, J; Zhao, J; Bai, L. (2023). Model-Measurement Data Integrity Attacks. IEEE Transactions on Smart Grid. 14(6): 4741 - 4757.
Published
Refereed?: Yes
5. Li, Y*; Yan, J; Naili, M. (2023). Penetration Testing of Cyber-Physical Attacks in Smart Grids Based on Partially Observable Markov Decision Process. IEEE Transactions on Transactions on Dependable and Secure Computing.
Submitted
Refereed?: Yes
6. Hu, C*; Yan, J; Liu, X. (2023). Reinforcement Learning-Based Adaptive Feature Boosting for Smart Grid Intrusion Detection. IEEE Transactions on Smart Grid. 14(4): 3150-3163.
Published
Refereed?: Yes
7. Hou, L; Li, Y*; Yan, J; Liu, Y; Ghafouri, M; Wang, L; Zhang, P. (2023). A Novel Iterative Double Auction Design and Simulation Platform for Packetized Energy Trading of Prosumers in A Residential Microgrid. Energy Conversion and Economics.
Revision Requested
Refereed?: Yes
8. Han X; Mu, C; Yan, J; Niu, Z. (2023). An Autonomous Control Technology Based on Deep Reinforcement Learning for Optimal Active Power Dispatch. International Journal of Electrical Power & Energy Systems. 145: 108686.
Published
Refereed?: Yes
9. Zadsar, M*; Abazari, A*; Ameli, A; Yan, J; Ghafouri, M. (2023). Prevention and Detection of Coordinated False Data Injection Attacks on Integrated Power and Gas Systems. IEEE Transactions on Power Systems. 38(5): 4252-4268.
Published
Refereed?: Yes
10. Li, Y*; Yan, J. (2023). Cybersecurity of Smart Inverters in the Smart Grid: A Survey. IEEE Transactions on Power Electronics. 38(2): 2364-2383.
Published
Refereed?: Yes

11. Ge, L; Liu, H; Yan, J; Sun, B; Li, Y; Hou, L. (2023). A Novel Distributed PV Data Virtual Collection with Continuous-Binary Denoising Auto-Encoders. *IEEE Transactions on Smart Grid*. 15(1): 1152-1164.
Published
Refereed?: Yes
12. Hou, L*; Li, Y*; Yan, J; Wang, C; Wang, L; Wang, B. (2023). Multi-agent reinforcement mechanism design for dynamic pricing-based demand response in charging network. *International Journal of Electrical Power and Energy Systems*. 147
Published
Refereed?: Yes
13. Ge, L; Liu, Y; Yan, J; Li, Y; Zhang, J. (2022). A Virtual Data Collection Model of Distributed PVs considering Spatio-Temporal Coupling and Affine Optimization Reference. *IEEE Transactions on Power Systems*. 38(4): 3939-3951.
Published
Refereed?: Yes
14. Li, Z*; Yan, J; Yu, W; Qiu, J. (2022). Adaptive Event-Triggered Control for Unknown Second-Order Nonlinear Multi-agent Systems. *IEEE Transactions on Cybernetics*. 51(12): 6131-6140.
Published
Refereed?: Yes
15. Hou, L*; Yan, J; Wang, C; Ge, L. (2022). A Simultaneous Multi-Round Auction Design for Scheduling Multiple Charges of Battery Electric Vehicles on Highways. *IEEE Transactions on Intelligent Transportation Systems*. 23(7): 8024-8036.
Published
Refereed?: Yes
16. Chen, T*; Li, S; Yan, J. (2022). CS-RNN: Efficient Training of Recurrent Neural Networks with Continuous Skips. *Neural Computing and Applications*. 34(19): 16515–16532.
Published
Refereed?: Yes
17. Liao, P*; Yan, J; Sellier, JM; Zhang, Y. (2022). Divergence-based Transferability Analysis for Self-Adaptive Smart Grid Intrusion Detection with Transfer Learning. *IEEE Access*. 10: 68807-68818.
Published
Refereed?: Yes, Open Access?: Yes
18. Hou, L*; Wang, C; Yan, J. (2022). An Incentive-Compatible Combinatorial Auction Design for Charging Network Scheduling of Battery Electric Vehicles. *Journal of Integrated Design and Process Science*. 24(2): 75-92.
Published
Refereed?: Yes
19. Cheng, G; Lin, Y; Zhao, J; Yan, J. (2022). A Highly Discriminative Detector against False Data Injection Attacks in AC State Estimation. *IEEE Transactions on Smart Grid*. 13(3): 2318-2330.
Published
Refereed?: Yes
20. Ge L, Liu H, Yan J, Zhu X, Zhang S, Li Y. (2022). Integrated Energy System Optimal Planning Considering Both Carbon Emissions Charging and DG Indeterminate Affine Model. *IEEE Transactions on Sustainable Energy*. 13(2): 905-918.
Published
Refereed?: Yes
21. Ge, L; Li, Y*; Li, Y*; Yan, J; Sun, Y. (2022). Smart Distribution Network Situation Awareness for High-Quality Operation and Maintenance: A Brief Review. *Energies*. 15(3): 828.
Published
Refereed?: Yes, Open Access?: Yes

22. Wang, D; Cheng, L; Yan, J. (2022). Self-Learning Robust Control Synthesis and Trajectory Tracking of Uncertain Dynamics. *IEEE Transactions on Cybernetics*. 52(1): 278-286.
Published
Refereed?: Yes
23. Zhang, M; Wu, Z; Yan, J; Lu, R; Guan, X. (2022). Attack-Resilient Optimal PMU Placement via Reinforcement Learning Guided Tree Search in Smart Grids. *IEEE Transactions on Information Forensics and Security*. 17: 1919-1929.
Published
Refereed?: Yes
24. Liao, P*; Yan, J; Sellier, JM; Zhang, Y*. (2022). TADA: A Transferable Domain-Adversarial Training for Smart Grid Intrusion Detection based on Ensemble Divergence Metrics and Spatiotemporal Features. *Energies*. 15(23): 8778.
Published
Refereed?: Yes, Open Access?: Yes
25. Ge, L; Liu, J; Yan, J; Umer Rafiq, M. (2022). Improved Harris Hawks Optimization for Configuration of PV Intelligent Edge Terminals. *IEEE Transactions on Sustainable Computing*. 7(3): 631-643.
Published
Refereed?: Yes
26. Varo, Q*; Lardier, W*; Yan, J. (2022). Dynamic Reduced-Round TLS Extension for Secure and Energy-Saving Communication of IoT Devices. *IEEE Internet of Things Journal*. 9(23): 23366-23378.
Published
Refereed?: Yes
27. Ge, L; Du, T; Li, C; Li, Y*; Yan, J; Rafiq, MU. (2022). Virtual Collection for Distributed Photovoltaic Data: Challenges, Methodologies, and Applications. *Energies*. 15(23): 8783.
Published
Refereed?: Yes, Open Access?: Yes
28. Li, Z*; Yan, J; Yu, W; Qiu, J. (2021). Event-Triggered Control for a Class of Nonlinear Multi-Agent Systems with Directed Graph. *IEEE Transactions on Systems, Man and Cybernetics: Systems*. 51(11): 6986-6993.
Published
Refereed?: Yes
29. Ge, L; Li, Y*; Yan, J; Wang, Y; Zhang, N. (2021). Short Term Load Prediction of Integrated Energy System with Wavelet Neural Network Model Based on Improved Particle Swarm Optimization and Chaos Optimization Algorithm. *Journal of Modern Power Systems and Clean Energy*. 9(6): 1490-1499.
Published
Refereed?: Yes
30. Ghafouri, M; Karaagac, U; Ameli, A; Yan, J; et al. (2021). A Cyber Attack Mitigation Scheme for Series Compensated DFIG-Based Wind Parks. *IEEE Transactions on Smart Grid*. 12(6): 5221-5232.
Published
Refereed?: Yes
31. Kabir, E*; Assi, C; Tushar, M; Yan, J. (2020). Optimal Scheduling of EV Charging at a Solar Power Based Charging Station. *IEEE Systems Journal*. 14(3): 4221-4231.
Published
Refereed?: Yes
32. Ge, L; Li, Y; Zhu, X; Zhou, Y; Wang, T; Yan J. (2020). An Evaluation System for HVDC Protection Systems by a Novel Indicator Framework and a Self-Learning Combination Method. *IEEE Access*. 8: 152053-152070.
Published
Refereed?: Yes, Open Access?: Yes

33. Ge, L; Xian, Y; Yan, J; et al. (2020). A Hybrid Model for Short-term PV Output Forecasting Based on PCA-GWO-GRNN. *Journal of Modern Power Systems and Clean Energy*. 8(6): 1268-1275.
Published
Refereed?: Yes
34. Wang, H; Pan, X; Yan, J; He, S. (2020). An Extended Regret Theory for Multi-Attribute Decision Making under Interval Type-2 Fuzzy Set Environment. *Information Sciences*. 512: 108-122.
Published
Refereed?: Yes
35. Bai, X; Dong, L; Ge, L; Xu, H; Zhang, J; Yan, J. (2020). Robust Localization of Mobile Robot in Industrial Environments With Non-Line-of-Sight Situation. *IEEE Access*. 8: 22537-22545.
Published
Refereed?: Yes, Open Access?: Yes
36. Ge, L; Zhang, S; Bai, X; Yan, J; et al. (2020). Optimal Capacity Allocation of Energy Storage System Considering Uncertainty of Load and Wind Generation. *Mathematical Problems in Engineering*. 512
Published
Refereed?: Yes
37. Ge, L; Li, Y; Li, S; Zhu, J; Yan, J. (2020). Evaluation of the Situational Awareness Effects for Smart Distribution Networks under the Novel Design of Indicator Framework and Hybrid Weighting Method. *Frontiers in Energy*.
Published
Refereed?: Yes
38. Hou, L*; Wang, C; Yan, J. (2020). Bidding for Preferred Timing: An Auction Design for Electric Vehicle Charging Station Scheduling. *IEEE Transactions on Intelligent Transportation Systems*. 21(8): 3332-3343.
Published
Refereed?: Yes
39. Kabir, E*; Assi, C; Alameddine, H; Antoun, J; Yan, J. (2020). Demand-Aware Provisioning of Electric Vehicles Fast Charging Infrastructure. *IEEE Transactions on Vehicular Technology*. 69(7): 6952-6963.
Published
Refereed?: Yes
40. Wang, D; Ha, M; Qiao, J; Yan, J; Xie, Y. (2020). Data-Based Composite Control Design with Critic Intelligence for A Wastewater Treatment Platform. *Artificial Intelligence Review*. (53): 3773-3785.
Published
Refereed?: Yes
41. Wu, F*; Yang, J; Yan, J; et al. (2020). Charging Power Demand Analysis of Electric Vehicles Considering Users' Bounded Rational Behavior. *International Journal of Electrical Power and Energy Systems*. 119: 105952.
Published
Refereed?: Yes
42. Ghafouri, M*; Minh, A; Kassouf, M; Debbabi, M; Assi, C; Yan, J. (2020). Detection and Mitigation of Cyber Attacks on Voltage Stability Monitoring of Power System. *IEEE Transactions on Smart Grid*. 11(6): 5227-5238.
Published
Refereed?: Yes
43. Jiang, G*; He, H; Yan, J; Xie, P. (2019). Multiscale Convolutional Neural Networks for Fault Diagnosis of Wind Turbine Gearbox. *IEEE Transactions on Industrial Electronics*. 66(4): 3196-3207.
Published
Refereed?: Yes

44. Wang, H; Yao, J*; Yan, J; Dong, M. (2019). An Extended TOPSIS Method Based on Gaussian Interval Type-2 Fuzzy Set. *International Journal of Fuzzy Systems*. 21(6): 1831-1843.
Published
Refereed?: Yes
45. Dong, L*; Yan, J; Yuan, X*; He, H; Sun, C. (2019). Functional Nonlinear Model Predictive Control Based on Adaptive Dynamic Programming. *IEEE Transactions on Cybernetics*. 49(12): 4206-4218.
Published
Refereed?: Yes
46. Li, S; Li, L*; Yan, J; He, H. (2018). SDE: A Novel Clustering Framework Based on Sparsity-Density Entropy. *IEEE Transactions on Knowledge and Data Engineering*. 30(8): 1575-1587.
Published
Refereed?: Yes
47. Jiang, G*; Xie, P; He, H; Yan, J. (2018). Wind Turbine Fault Detection Using Denoising Autoencoder with Temporal Information. *IEEE/ASME Transactions on Mechatronics*. 23(1): 89-100.
Published
Refereed?: Yes

Book Chapters

1. Hou L*, Wang C, Yan J. (2019). Electric Vehicle Charging Scheduling in Green Logistics: Challenges, Approaches and Opportunities. Awasthi A, Grzybowska K. *Sustainable City Logistics Planning: Methods and Applications*. : 1-22.
In Press, NOVA Publishers
Refereed?: Yes

Conference Publications

1. Hu*, C; Wu, H; Li, X; Ma, C; Chen, X; Yan, J; Wang, B; Liu, X. (2024). Less or More From Teacher: Exploiting Trilateral Geometry For Knowledge Distillation. *International Conference on Learning Representations (ICLR)*,
Paper
Accepted
Refereed?: Yes, Invited?: No
2. Chen, J*; Du, H*; Yan, J; Zgheib, R; Debbabi, M. (2023). A Data Integrity Attack Targeting VSC-HVDC-Connected Offshore Wind Farms. *IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm)*, Scotland,
Conference Date: 2023/10
Paper
Published
Refereed?: Yes, Invited?: No
3. Li, Y*; Hou, L; Yan, J; Liu, Y; Ghafouri, M; Zhang, P. (2023). A Two-Stage Packetized Energy Trading and Management Framework for Virtual Power Plants. *IEEE Power & Energy Society General Meeting (PESGM)*, Orlando, FL, United States of America
Conference Date: 2023/7
Paper
Published
Refereed?: Yes, Invited?: No

4. Chen, y; Wu, P; Li*, Y; Zhang, P; Yan, J; Ghafouri, M; Liu, Y. (2023). A Blockchain-based Co-Simulation Platform for Transparent and Fair Energy Trading and Management. ACM International Symposium on Blockchain and Secure Critical Infrastructure, Melbourne, Australia
Conference Date: 2023/7
Paper
Published
Refereed?: Yes, Invited?: No
5. Liao, J*; Yan, J; Tao, Q. (2023). DualHGNN: A Dual Hypergraph Neural Network for Semi-Supervised Node Classification Based on Multi-View Learning and Density Awareness. International Joint Conference on Neural Networks (IJCNN), Australia
Conference Date: 2023/6
Paper
Published
Refereed?: Yes, Invited?: No
6. Chen, J*; Yan, J; Du, H*; Debbabi, M; Kassouf, M. (2023). Vulnerability Analysis of Virtual Power Plant Voltage Support under Denial-of-Service Attacks. North American Innovative Smart Grid Technologies Conference (ISGT-NA), Washington DC, United States of America
Conference Date: 2023/1
Paper
Published
Refereed?: Yes, Invited?: No
7. Du, H*; Yan, J; Ghafouri, M; Zgheib, R; Debbabi, M. (2022). Online Attack-aware Risk Management for PMSG-based Wind Farm Depending on System Strength Evaluation. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Singapore
Paper
Published
Refereed?: Yes, Invited?: No
8. Du, W; Yang, J; Chen, T*; Yao, J*; Yan, J; Ge, H; Bhuiyan N; Zhou, F; Liu, X; Zeng, Y. (2022). Sustainable Policy Design - How Policy impacts Household Waste Management: A Case-study from Shanghai. International Conference on Building Energy and Environment (COBEE),
Paper
Published
Refereed?: Yes, Invited?: No
9. Li, Y*; Hou, L; Du, H*; Yan, J; Liu, Y; Ghafouri, M; Zhang, P. (2022). PEMT-CoSim: A Co-Simulation Platform for Packetized Energy Management and Trading in Distributed Energy Systems. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Singapore
Paper
Published
Refereed?: Yes, Invited?: No
10. Ge, L; Liu, H, Rafiq, M; Yan, J; Li, Y. (2022). Complex Affine Model of Line Loss for Distribution Network Considering Line Parameter Uncertainty. IEEE Power & Energy Society General Meeting, Denver, United States of America
Paper
Published
Refereed?: Yes, Invited?: No

11. Li, Y*; Yan, J, Naili, M. (2022). Deep Reinforcement Learning for Penetration Testing of Cyber-Physical Attacks in the Smart Grid. IEEE World Congress on Computational Intelligence (WCCI)/International Joint Conference on Neural Networks (IJCNN), Padua, Italy
Conference Date: 2022/7
Paper
Published
Refereed?: Yes, Invited?: No
12. Sun, F*; Tao, Q; Yan, J; Hu, J; Yang, Z. (2022). MRGAN: Multi-Criterion Relational GAN for Lyrics-Conditional Melody Generation. IEEE World Congress on Computational Intelligence (WCCI)/International Joint Conference on Neural Networks (IJCNN), Padua, Italy
Conference Date: 2022/7
Paper
Published
Refereed?: Yes, Invited?: No
13. Li, S*; Qiao, L*; Zhang, Y, Yan, J. (2022). An Early Forest Fire Detection System Based On M300 Drone and H20T Camera. International Conference on Unmanned Aircraft System (ICUAS), Dubrovnik, Croatia
Conference Date: 2022/6
Paper
Published
Refereed?: Yes, Invited?: No
14. Chen, T*; Yang, J*; Du, W*; Yao, J*; Yan, J; Ge, H; Bhuiyan, N; Zhou, F; Liu, Y; Zeng, Y. (2022). Data Quality Criteria for Urban Waste Management Policy-Making Using Environment-based Design. IFAC Conference on Manufacturing Modelling, Management and Control (MIM), Nantes, France
Conference Date: 2022/6
Paper
Published
Refereed?: Yes, Invited?: Yes
15. Ge, L; Li, Y; Yan, J. (2021). Self-Adaptive Evaluation of Hybrid AC/DC Distribution Networks with Multi-Energy Complementary Systems. IEEE Power & Energy Society General Meeting (PESGM),
Paper
Published
Refereed?: Yes, Invited?: No
16. Du, H*; Yan, J; et al. (2021). Modeling of Cyber Attacks Against Converter-Driven Stability of PMSG-Based Wind Farms with Intentional Subsynchronous Resonance. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Aachen, Germany
Conference Date: 2021/10
Paper
Published
Refereed?: Yes, Invited?: No
17. Zhang, M; Fu, S; Yan, J; et al. (2021). An XGBoost-Based Vulnerability Analysis of Smart Grid Cascading Failures under Topology Attacks. IEEE International Conference on Systems, Man, and Cybernetics (SMC), Melbourne, Australia
Conference Date: 2021/10
Paper
Published
Refereed?: Yes, Invited?: No

18. Du, W*; Yang, J*; Ge, H; Yan, J; Nadia, B; Liu, X; Zhou, F; Zeng, Y. (2021). Environment-Based Design (EBD) Approach to Identify Critical Issues in Managing Municipal Solid Waste: Nairobi, Kenyan Case Study. International Conference on Smart Data and Smart Cities, Stuttgart, Germany
Conference Date: 2021/9
Paper
Published
Refereed?: Yes, Invited?: No
19. Liao, P*; Chang, Y; Yan, J. (2020). Electrochemical Method on the Optimum Cathodic Protection Potential of Grounding Grid in High Resistivity Soil. IEEE Power & Energy Society General Meeting (PESGM), Montreal, Canada
Conference Date: 2020/8
Paper
Published
Refereed?: Yes, Invited?: No
20. Hu, C*; Yan, J; Liu, X. (2020). Adaptive Feature Boosting of Multi-Sourced Deep Autoencoders for Smart Grid Intrusion Detection. IEEE Power & Energy Society General Meeting (PESGM), Montreal, Canada
Conference Date: 2020/8
Paper
Published
Refereed?: Yes, Invited?: No
21. Ge, L; Xian, Y; Yan, J; Wang, Y; Li, Y*; Liang, D. (2020). A FA-GWO-GRNN Method for Short-Term Photovoltaic Output Prediction. IEEE Power & Energy Society General Meeting (PESGM), Montreal, Canada
Conference Date: 2020/8
Paper
Published
Refereed?: Yes, Invited?: No
22. Zhang, S; Bai, X; Ge, L; Yan, J. (2020). Optimal Configuration of Energy Storage System Considering Uncertainty of Load and Wind Generation. IEEE Power & Energy Society General Meeting (PESGM), Montreal, Canada
Conference Date: 2020/8
Paper
Published
Refereed?: Yes, Invited?: No
23. Rahman, M*; Li, Y*; Yan, J. (2020). Multi-Objective Evolutionary Optimization for Worst-Case Analysis of False Data Injection Attacks in the Smart Grid. IEEE World Congress on Computational Intelligence (WCCI)/Congress on Evolutionary Computation (CEC), Glasgow, United Kingdom
Conference Date: 2020/7
Paper
Published
Refereed?: Yes, Invited?: No
24. Zhang, Y*; Yan, J. (2020). Semi-Supervised Domain-Adversarial Training for Intrusion Detection against False Data Injection in the Smart Grid. IEEE World Congress on Computational Intelligence (WCCI)/International Joint Conference on Neural Networks (IJCNN), Glasgow, United Kingdom
Conference Date: 2020/7
Paper
Published
Refereed?: Yes, Invited?: No

25. Hou, L*; Ma, S; Yan, J; et al. (2020). Reinforcement Mechanism Design for Electric Vehicle Demand Response in Microgrid Charging Stations. IEEE World Congress on Computational Intelligence (WCCI)/ International Joint Conference on Neural Networks (IJCNN), Glasgow, United Kingdom
Conference Date: 2020/7
Paper
Published
Refereed?: Yes, Invited?: No
26. Lardier, W*; Varo, Q*; Yan, J. (2020). Dynamic Reduced-Round Cryptography for Energy-Efficient Wireless Communication of Smart IoT Devices. IEEE International Conference on Communications (ICC), Dublin, Ireland
Conference Date: 2020/6
Paper
Published
Refereed?: Yes, Invited?: No
27. Li, Z; Yan, J; Yu, W; Qiu, J. (2019). Adaptive Event-Triggered Consensus Control for A Class of Unknown Second-Order Nonlinear Multi-Agent Systems. Chinese Control Conference (CCC2019),
Paper
Published
Refereed?: Yes, Invited?: No
28. Lardier, W*; Varo, Q*; Yan, J. (2019). Quantum-Sim: An Open-Source Co-Simulation Platform for Quantum KeyDistribution-Based Smart Grid Communications. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Paper
Published
Refereed?: Yes, Invited?: No
29. Hou, L*; Yan, J; Wang, C. (2019). Accommodating More Users in Highway Electric Vehicle Charging through Coordinated Booking: A Market-Based Approach. IEEE International Conference on Computer Supported Cooperative Work in Design (CSCWD),
Paper
Published
Refereed?: Yes, Invited?: No
30. Hu, C*; Yan, J; Wang C. (2019). Robust Feature Extraction and Ensemble Classification Against Cyber-Physical Attacks in the Smart Grid. IEEE Electrical Power and Energy Conference (EPEC), Montreal, Canada
Paper
Published
Refereed?: Yes, Invited?: No
31. Zhang, Y*; Yan, J. (2019). Domain-Adversarial Transfer Learning Against Unknown Threats in SmartGrid Communications. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Paper
Published
Refereed?: Yes, Invited?: No
32. Kabir, E*; Assi, C; Alameddine, H; Antoun, J; Yan, J. (2019). Demand Aware Deployment and Expansion Method for an Electric Vehicles Fast Charging Network. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), Beijing, China
Paper
Published
Refereed?: Yes, Invited?: No

33. Rahman, M*; Yan, J. (2019). Finding the Worse Case: Undetectable False Data Injection with Minimized Knowledge and Resource. IEEE Global Communications Conference (GLOBECOM), Waikoloa Village, United States of America
Conference Date: 2019/12
Paper
Published
Refereed?: Yes, Invited?: No
34. Hu, C*; Yan, J; Wang, C. (2019). Advanced Cyber-Physical Attack Classification with Extreme Gradient Boosting for Smart Transmission Grids. IEEE Power and Energy Society (PES) General Meeting, Atlanta, GA, United States of America
Conference Date: 2019/8
Paper
Published
Refereed?: Yes, Invited?: No
35. Wilson, D*; Yan, J; Tang, Y; Lu, Z. (2018). Deep Learning-Aided Cyber-Attack Detection in Power Transmission Systems. IEEE Power and Energy Society (PES) General Meeting, Portland, United States of America
Conference Date: 2018/8
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Patents

1. Modeling of Adversarial Artificial Intelligence in Blind False Data Injection against AC State Estimation in the Smart Grid Security, Safety and Reliability. Canada. P102858WO01 (internal).
Patent Status: Pending
Inventors: Fapi E, Rahman M, Yan J
2. Penetration Testing Method for Cyber-Physical Systems. United States of America. 2022/12/21.
Patent Status: Pending
Inventors: Li Y, Naili M, Yan J



Date Submitted: 2024-01-21 21:15:38

Confirmation Number: 1729997

Template: NSERC_Researcher

Dr. Amr Youssef

Correspondence language: English

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Protected when completed

Dr. Amr Youssef

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
Arabic	Yes	Yes	Yes	Yes	Yes
English	Yes	Yes	Yes	Yes	Yes
French	No	No	No	No	No

Degrees

- 2001/10 Post-doctorate, Cryptography and Data Security, University of Waterloo
Supervisors: Guang Gong, 1999/9 - 2011/8
- 1997/12 Doctorate, Cryptography and Data Security, Queen's University at Kingston
Supervisors: Tavares, Stafford, 1993/9 - 1997/12
- 1993/9 Master's Thesis, Speech Recognition, Cairo University
Supervisors: Mohsen Rashwan, 1990/10 - 1993/7
- 1990/7 Bachelor's, Electronics and Communications, Cairo University

Recognitions

- 2022/12 Best Paper Award
Anti-Phishing Working Group (APWG)
Prize / Award
Our paper entitled "Leaky Kits: The Increased Risk of Data Exposure from Phishing Kits" presented at Symposium on Electronic Crime Research (eCrime 2022) was awarded the best paper award. We were also invited to present the work to Canadian Radio-television and Telecommunications Commission (CRTC).
- 2021/7 First place student paper contest
Organization committee for the 7th IEEE World Forum on Internet of Things, WF-IoT 2021
Prize / Award
Title: Lightweight Authentication and Key Agreement Protocol for Edge Computing
Applications Authors: Nakkar M*, AlTawy R, and Youssef A
- 2020/12 - 2020/12 Distinguished Paper Award. Annual Computer Security Applications Conference (ACSAC 2020)
Applied Computer Security Associates
Prize / Award
Title: Betrayed by the Guardian: Security and Privacy Risks of Parental Control Solutions
Authors Ali S*, Elgharabawy M*, Duchaussoy Q*, Mannan M, Youssef A

- 2020/11 Innovation Prize 2020 Finalist, Industrial Research sector
Consortium for Research and Innovation in Aerospace in Quebec (CRIAQ)
Prize / Award
Awarded by Consortium for Research and Innovation in Aerospace in Quebec (CRIAQ) in partnership with Mannarino, Nordiasoft, Polytechnique and Concordia University in recognition for the work done in the project entitled Real-Time Operating System For Safety Critical Systems
- 2018/6 Tier I ENCS Research Excellence Award
Concordia University
Prize / Award
Engineering and Computer Science (ENCS) Research Excellence Award
- 2017/12 Best Paper Award, , 7th workshop on Socio-Technical Aspects in Security and Trust, (STAST 2017).
Technical Program Committee of STATS 2017
Prize / Award
Title: Towards a Comprehensive Framework for Evaluating Smart Toys' Privacy Practices
Authors: Mahmoud M*, Hossen M*, Barakat H*, Mannan M and Youssef A
- 2017/12 2nd prize for Best Poster Presentation, the 29th IEEE International Conference on Microelectronics, ICM 2017
Technical Program Committee of ICM 2017
Prize / Award
Paper Title: A Power Analysis Resistant FPGA Implementation of NTRUEncrypt, Authors: Mahmoud M*, Nakkar M*, and Youssef A

User Profile

Research Specialization Keywords: Cryptography, Cryptanalysis, Network security, Symmetric key systems, Cyber-physical systems security

Employment

- 2011/6 Professor
Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University
Full-time, Professor
Tenure Status: Tenure
- 2004/8 - 2011/6 Associate Professor
Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University
Full-time, Associate Professor
Tenure Status: Tenure
- 2001/10 - 2004/7 Assistant professor
Electronics and Communications Engineering Dept, Engineering, Cairo University
Full-time, Assistant Professor
Tenure Status: Tenure
- 2001/10 - 2004/7 Part time Research Scientist
Technology Development Center, IBM

1999/10 - 2001/10	Postdoctor Combinatorics and Optimization, University of Waterloo Full-time Tenure Status: Non Tenure Track
1998/1 - 1999/4	Systems Engineer Broadband Wireless Access, Nortel Networks
1992/3 - 1993/9	Part-time Research Associate Scientific Center, IBM
1990/9 - 1993/8	Appointed full-time Teaching Assistant Dept. of Electronics and Communications Engineering, Cairo University Full-time Tenure Status: Tenure Track

Research Funding History

Awarded [n=9]

2020/5 - 2026/4 Principal Investigator	Cryptographic Methods for Securing CyberPhysical Systems, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) NSERC Discovery Total Funding - 276,000 Portion of Funding Received - 276,000 Funding Competitive?: Yes
2023/6 - 2024/6 Co-applicant	Privacy Analysis of AR/VR Online Shopping Applications, Grant Funding Sources: Office of Privacy Commissioner of Canada Total Funding - 34,454 Portion of Funding Received - 17,227 Funding Competitive?: Yes Co-applicant : Mannan; Mohammad
2022/4 - 2023/3 Co-applicant	Privacy Analysis of Technologies Used in Intimate Partner Abuse, Grant Funding Sources: Office of Privacy Commissioner of Canada Total Funding - 48,836 Portion of Funding Received - 24,418 Funding Competitive?: Yes Co-applicant : Mannan; Mohammad
2021/5 - 2022/6 Co-applicant	Privacy Report Card for Online Solutions Targeting Seniors, Grant Funding Sources: Office of Privacy Commissioner of Canada Total Funding - 49,739 Portion of Funding Received - 24,869 Funding Competitive?: Yes
2020/6 - 2021/5 Co-investigator	Detecting advanced phishing and malicious websites, Grant Funding Sources: Canadian Internet Registration Authority Total Funding - 52,325

Portion of Funding Received - 26,162

Funding Competitive?: Yes

2018/9 - 2020/9

Co-applicant

Enabling IoT Analytics across Edge and Cloud Platforms, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Strategic Grant

Total Funding - 480,000

Portion of Funding Received - 90,000

Funding Competitive?: Yes

Co-applicant : Hafid, Abdelhakim;

Principal Investigator : Cherkaoui, Soumaya

2015/5 - 2020/4

Principal Investigator

Analysis and Design of Authenticated Encryption Schemes, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Discovery

Total Funding - 150,000

Portion of Funding Received - 150,000

Funding Competitive?: Yes

2019/4 - 2020/3

Co-applicant

Privacy Report Card for Parental Control Solutions, Grant

Funding Sources:

Office of the Privacy Commissioner of Canada

Total Funding - 49,739

Portion of Funding Received - 24,869

Funding Competitive?: Yes

Co-applicant : Mannan, Muhammad

2018/3 - 2020/2

Principal Investigator

Real-Time Operating System For Safety Critical Systems, Contract

Funding Sources:

Quebec (CRIAQ)

Total Funding - 169,900

Portion of Funding Received - 169,900

Funding Competitive?: Yes

Completed [n=4]

2018/4 - 2019/3

Co-applicant

Privacy Leakage in Canadian Public Wi-Fi Networks, Office of Privacy Commissioner of Canada, Contract

Funding Sources:

Office of the Privacy Commissioner of Canada

Total Funding - 58,391

Portion of Funding Received - 29,195

Funding Competitive?: Yes

Co-applicant : Mannan, Muhammad

2018/6 - 2018/11

Principal Investigator

Exploring the Blockchain Technology in Electricity Trading, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Engage

Total Funding - 25,000

Portion of Funding Received - 25,000

2017/4 - 2018/3 Co-applicant	Funding Competitive?: Yes Privacy report card for children's smart toys, Office of Privacy Commissioner of Canada, Grant Funding Sources: Office of the Privacy Commissioner of Canada Total Funding - 49,767 Portion of Funding Received - 24,883 Funding Competitive?: Yes Co-applicant : Mannan, Muhammad
2016/9 - 2017/2 Principal Investigator	Methods and Techniques for the Analysis of Encrypted Traffic, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Engage Total Funding - 25,000 Portion of Funding Received - 25,000 Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=24]

2023/9 - 2025/8 Co-Supervisor	Rezaei, Fahimeh (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Privacy issues in Single-Sign-On Present Position: M.A.Sc student, Concordia University
2023/9 - 2025/8 Principal Supervisor	Hawis, Tariq (In Progress) , Concordia University Student Degree Expected Date: 2025/8 Thesis/Project Title: Cybersecurity of fleet managment platforms Present Position: M.A.Sc student, Concordia University
2023/6 - 2023/11 Co-Supervisor	Francesca Stabile (In Progress) , University of Calabria Thesis/Project Title: Encrypted Control of Cyber-physical Systems (MITAC visting student) Present Position: PhD Student, University of Calabria
2022/9 - 2024/9 Principal Supervisor	Mangeard, Philippe (In Progress) , Concordia University Student Degree Expected Date: 2024/9 Thesis/Project Title: Privacy Analysis of Technologies Used in Intimate Partner Abuse Present Position: Master Student, Concordia University
2022/9 - 2024/8 Co-Supervisor	Khan, Md Shakib (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: Graph Neural Network based anomay detection systems Present Position: M.A.Sc student, Concordia University
2022/9 - 2024/9 Co-Supervisor	Lamisa, Kazi Farhat (In Progress) , Concordia University Student Degree Expected Date: 2024/9 Thesis/Project Title: Security Analysis of Security of Web Authentication Protocols Present Position: Master Student, Concordia University

2022/9 - 2024/9 Principal Supervisor	Ragab, Abdelrahman (In Progress) , Concordia University Student Degree Expected Date: 2024/9 Thesis/Project Title: Privacy Issues in Virtual Reality and Augmented Reality Apps Present Position: Master Student, Concordia University
2022/1 - 2023/11 Co-Supervisor	Baskaran, Supraja (In Progress) , Concordia University Student Degree Expected Date: 2023/11 Thesis/Project Title: Authentication problems in the super-app ecosystems Present Position: M.A.Sc student, Concordia University
2021/9 - 2023/8 Principal Supervisor	Xiufen Yu (Completed) , Concordia University Thesis/Project Title: Privacy analysis of hospitals websites Present Position: M.A.Sc student, Concordia University
2021/1 - 2023/1 Co-Supervisor	Bhaskar Tejaswi (Completed) , Concordia University Thesis/Project Title: Analysis of Live Phishing Kits Present Position: M.A.Sc student, Concordia University
2021/1 - 2023/1 Co-Supervisor	Rohan Pagey (Completed) , Concordia University Thesis/Project Title: Security analysis of elderly-focused IoT devices Present Position: M.A.Sc student, Concordia University
2020/9 - 2022/8 Co-Supervisor	Kapoor, Pranay (Completed) , Concordia University Thesis/Project Title: Privacy analysis of Android Apps Present Position: Master Student, Concordia University
2020/9 - 2022/4 Co-Supervisor	Kluban, Maryna (Completed) , Concordia University Thesis/Project Title: Security analysis of Java scripts Present Position: Master Student, Concordia University
2019/9 - 2021/10 Principal Supervisor	Elgharabawy, Mounir (Completed) , Concordia University Thesis/Project Title: Cross-vendor Security Analysis of Android Unix Domain Sockets Present Position: Master Student, Concordia University
2019/9 - 2021/12 Co-Supervisor	Shobiri, Behnam (Completed) , Concordia University Thesis/Project Title: CDNS' DARK SIDE: SECURITY PROBLEMS IN CDN-TO-ORIGIN CONNECTIONS Present Position: Master Student, Concordia University
2019/5 - 2021/8 Co-Supervisor	Shahab Uddin, Md (Completed) , Concordia University Thesis/Project Title: SECURITY ASSESSMENT FRAMEWORK FOR ANDROID CRYPTO WALLETS Present Position: Master Student, Concordia University
2019/1 - 2020/11 Co-Supervisor	Duchaussoy, Quentin (Completed) , Concordia University Thesis/Project Title: Privacy of Parental Control Applications Present Position: Master Student, Concordia University
2019/1 - 2020/11 Co-Supervisor	Abdelwahab, Ahmed (Completed) , Concordia University Thesis/Project Title: Secure Control for Cyber-Physical Systems Present Position: Master Student, Concordia University
2018/9 - 2020/8 Co-Supervisor	Safaie, Tina (Completed) , Concordia University Thesis/Project Title: Security and Usability of Password Managers Present Position: Master Student, Concordia University
2018/9 - 2020/9 Co-Supervisor	Osman, Tousif (Completed) , Concordia University Thesis/Project Title: Mobile Operating Systems Security Present Position: Master Student, Concordia University

2018/9 - 2020/5 Co-Supervisor	Ali, Suzan (Completed) , Concordia University Thesis/Project Title: Privacy Analysis of Canadian Wi-Fi Hotspots Present Position: Master Student, Concordia University
2018/6 - 2018/6 Principal Supervisor	Waked, Louis (Completed) , Concordia University Thesis/Project Title: Analyzing TLS Interception in Middleware Network Appliances Present Position: Security Analyst, Morgan Stanley, Montreal
2017/1 - 2019/12 Principal Supervisor	Shasha, Sharon (In Progress) , Concordia University Student Degree Expected Date: 2019/12 Thesis/Project Title: Privacy and Security Analysis of IoT in Smart Homes Present Position: Lecturer, Dawson College, Montreal
2016/5 - 2018/3 Principal Supervisor	Mahmoud, Moustafa (Completed) , Concordia University Thesis/Project Title: An Experimental Evaluation of Smart Toys' Security and Privacy Practices Present Position: Cyber security analyst, onePoint for BNP Paribas bank, Montreal
Doctorate [n=13]	
2022/1 - 2026/1 Principal Supervisor	Hofny, Mahmoud Abdelsattar (In Progress) , Concordia University Student Degree Expected Date: 2026/1 Thesis/Project Title: Trusted Execution Environment (TEE)-enabled security protocols Present Position: Concordia University, Concordia University
2021/9 - 2023/8 Principal Supervisor	Ahmed Aly (In Progress) , Concordia University Student Degree Expected Date: 2026/8 Thesis/Project Title: Detecting Advanced Persistent Threats in Early Stages Present Position: M.A.Sc student, Concordia University
2019/9 - 2023/8 Principal Supervisor	Seifelnasr, Mohamed (In Progress) , Concordia University Student Degree Expected Date: 2024/8 Thesis/Project Title: Security of Cyber Physical Systems Present Position: PhD Student, Concordia University
2019/5 - 2019/5 Co-Supervisor	Kamel, Mahmoud (Completed) , Concordia University Thesis/Project Title: Performance Evaluation of Ultra-Dense Networks with Applications in Internet-of-Things Present Position: Postdoctoral fellow, McGill University
2019/1 - 2022/12 Principal Supervisor	Nakkar, Mouna (In Progress) , Concordia University Student Degree Expected Date: 2022/12 Thesis/Project Title: Cryptographic protocols for IoT and edge computing Present Position: PhD student, Concordia University
2018/9 - 2022/8 Principal Supervisor	Elsayed, Mohammed (Completed) , Concordia University Thesis/Project Title: Machine to Machine Communications Present Position: PhD student, Concordia University
2017/9 - 2022/4 Principal Supervisor	Galal, Hisham (Completed) , Concordia University Thesis/Project Title: Privacy of Blockchain applications Present Position: PhD student, Concordia University
2017/5 - 2022/4 Co-Supervisor	Cabana, Olivier (In Progress) , Concordia University Student Degree Expected Date: 2024/1 Thesis/Project Title: Cyber Threat Intelligence for Industrial Control Systems Present Position: PhD Student, Concordia University

2017/1 - 2021/5 Principal Supervisor	EISheikh, Muhammad (Completed) , Concordia University Thesis/Project Title: MILP-based Cryptanalysis of Symmetric Key Ciphers Present Position: PhD Student, Concordia University
2016/9 - 2017/6 Principal Supervisor	Nakkar, Mouna (In Progress) , Concordia University Student Degree Expected Date: 2024/1 Thesis/Project Title: Secure Hardware Implementation of Post Quantum Cryptosystems Present Position: PhD Student, Concordia University
2014/9 - 2019/12 Principal Supervisor	AL-Barakati, Abdullah (In Progress) , Concordia University Student Degree Expected Date: 2018/8 Thesis/Project Title: Smart Grid Security Present Position: PhD student, Concordia University
2014/1 - 2017/12 Principal Supervisor	Tolba, Mohamed (Completed) , Concordia University Thesis/Project Title: Analysis and Design of Symmetric Key Primitives Present Position: MITACS Postdoctoral fellow, Concordia University and Manarino Systems and Software Inc
2013/9 - 2017/12 Principal Supervisor	Ahmed AbdelKhalek (Completed) , Concordia University Thesis/Project Title: Analysis and Design of Symmetric Key Primitives Present Position: Systems Engineer, Nokia

Post-doctorate [n=1]

2018/1 - 2019/12 Principal Supervisor	Tolba, Mohamed (Completed) , Concordia University Thesis/Project Title: Cyber Security in Avionics Systems Present Position: Postdoctoral fellow, Concordia University and Manarino Systems and Software Inc
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Event Administration

2023/9 - 2024/7	Technical Program Committee Member, 15th International Conference on Cryptology in Africa (AFRICACRYPT 2024), Conference, 2024/7 - 2024/7
2023/7 - 2024/3	Technical Program Committee Member, 22nd International Conference on Applied Cryptography and Network Security (ACNS 2024), Conference, 2024/3 - 2024/3
2023/10 - 2023/12	Technical Program Committee Member, 14th International Conference on Security, Privacy, and Applied Cryptographic Engineering (SPACE 2024), Conference, 2023/12 - 2023/12
2023/4 - 2023/7	Technical Program Committee Member, 5th International Congress on Blockchain and Applications (BLOCKCHAIN'23), Conference, 2023/7 - 2023/7
2023/2 - 2023/6	Technical Program Committee Member, Technical Program Committee Member, 9th Workshop on Current Trends in Cryptology (CTCrypt 2023), Conference, 2023/6 - 2023/6
2022/9 - 2023/3	Technical Program Committee Member, 2023 IEEE PES Conference on Innovative Smart Grid Technologies - Middle East (ISGT Middle East, Conference, 2023/3 - 2023/3
2022/9 - 2022/12	Technical Program Committee Member, 12th International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2022),, Conference, 2022/12 - 2022/12
2022/8 - 2022/10	Technical Program Committee Member, International conference on Cryptography, Coding theory and Cyber security (I4CS'22), Conference, 2022/10 - 2022/10

2022/5 - 2022/8	Technical Program Committee Member, The 19th Annual International Conference on Privacy, Security & Trust (PST2022), Conference, 2022/8 - 2022/8
2022/5 - 2022/7	Technical Program Committee Member, 4th International Congress on Blockchain and Applications (BLOCKCHAIN'22), Conference, 2022/7 - 2022/7
2022/4 - 2022/6	Technical Program Committee Member, The 4th Blockchain Technology Symposium (BTS 2022), Conference, 2022/6 - 2022/6
2021/7 - 2021/12	Technical Program Committee Member, THE FIFTH IEEE WORKSHOP ON 5G AND BEYOND WIRELESS SECURITY (5TH IEEE WIRELESS-SEC 2021), Workshop, 2021/12 - 2021/12
2021/11 - 2021/11	Technical Program Committee Member, Eleventh International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2021), Conference, 2021/11 - 2021/11
2021/10 - 2021/11	Technical Program Committee Member, The 4th IEEE International Symposium on Future Cyber Security Technologies (FCST 2021), Conference, 2021/11 - 2021/11
2021/9 - 2021/11	Technical Program Committee Member, The Fifteenth International Conference on Emerging Security Information, Systems and Technologies (SECURWARE 2021), Conference, 2021/11 - 2021/11
2021/5 - 2021/6	Technical Program Committee Member, 3rd International Congress on Blockchain and Applications (BLOCKCHAIN'21), Conference, 2021/6 - 2021/6
2021/2 - 2021/6	Technical Program Committee Member, 10th Workshop on Current Trends in Cryptology (CTCrypt 2021), Conference, 2021/6 - 2021/6
2020/12 - 2020/12	Technical Program Committee Member, Tenth International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2020), Conference, 2020/12 - 2020/12
2020/7 - 2020/7	Technical Program Co-chair, 12th Annual International Conference on the Theory and Applications of Cryptology (Africacrypt 2020), Conference, 2020/7 - 2020/7
2020/6 - 2020/6	Technical Program Committee Member, 9th Workshop on Current Trends in Cryptology (CTCrypt 2020), Conference, 2020/6 - 2020/6
2019/12 - 2019/12	Technical Program Committee Member, 9th International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2019), Conference, 2019/12 - 2019/12
2019/11 - 2019/11	Technical Program Committee Member, 16th ACS/IEEE International Conference on Computer Systems and Applications (AICCSA 2019), Conference, 2019/11 - 2019/11
2019/8 - 2019/8	Technical Program Committee Member, 17th Annual Conference on Privacy, Security and Trust (PST2019), Conference, 2019/8 - 2019/8
2019/7 - 2019/7	Technical Program Committee Member, 11th Annual International Conference on the Theory and Applications of Cryptology (Africacrypt 2019), Conference, 2019/7 - 2019/7
2019/6 - 2019/6	Technical Program Committee Member, 8th Workshop on Current Trends in Cryptology (CTCrypt 2019), Conference, 2019/6 - 2019/6
2019/4 - 2019/4	Technical Program Committee Member, 3rd International Conference on Codes, Cryptology And Information Security (C2SI 2019), Conference, 2019/4 - 2019/4
2018/12 - 2018/12	Technical Program Committee Member, 8th International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2018), Conference, 2018/12 - 2018/12
2018/11 - 2018/11	Organization chair, 11th International Symposium on Foundations & Practice of Security (FPS 2018), Conference, 2108/11 - 2018/11

2018/8 - 2018/8	Technical Program Committee Member, 25th Conference on Selected Areas in Cryptography 2018 (SAC 2018), Conference, 2018/8 - 2018/8
2018/8 - 2018/8	Technical Program Committee Member, 16th Annual Conference on Privacy, Security and Trust (PST2018), Conference, 2018/8 - 2018/8
2018/6 - 2018/6	Technical Program Committee Member, 7th Workshop on Current Trends in Cryptology (CTCrypt 2018), Conference, 2018/6 - 2018/6
2018/5 - 2018/5	Technical Program Committee Member, 10th Annual International Conference on the Theory and Applications of Cryptology (Africacrypt 2018), Conference, 2018/5 - 2018/5
2017/12 - 2017/12	Technical Program Committee Member, 7th International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE 2017), Conference, 2017/12 - 2017/12
2017/8 - 2017/8	Technical Program Committee Member, 24th Conference on Selected Areas in Cryptography 2017 (SAC 2017), Conference, 2017/8 - 2017/8
2017/6 - 2017/6	Technical Program Committee Member, 6th Workshop on Current Trends in Cryptology (CTCrypt 2017), Conference, 2017/6 - 2017/6
2017/5 - 2017/5	Technical Program Committee Member, 9th Annual International Conference on the Theory and Applications of Cryptology (Africacrypt 2017), Conference, 2017/5 - 2017/5
2017/4 - 2017/4	Technical Program Committee Member, 2nd International Conference on Codes, Cryptology And Information Security (C2SI 2017), Conference, 2017/4 - 2017/4

Presentations

1. (2019). Privacy Preserving Auctions on top of Ethereum. 3rd International Conference on Codes, Cryptology and Information Security (C2SI-2019), Rabbat, Morocco
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes

Text Interviews

2020/12/04	Many Popular Parental Control Solutions Are Insecure (This is related to our conference paper entitled: Betrayed by the Guardian: Security and Privacy Risks of Parental Control Solutions), which won the Distinguished paper award at ACSAC 2020., ACM TechNews
2020/01/09	L'impact des voitures électriques sur la sécurité du réseau électrique. This is related to our conference paper entitled: Impact of Electric Vehicles Botnets on the Power Grid, which is published at IEEE Canada Electric Power Conference, EPEC 2019, The Association of Electric Vehicles of Quebec (AVEC)
2019/10/08	Enterprise TLS proxy analysis (This is related to our ASIACCS 2018 paper entitled: To intercept or not to intercept: Analyzing TLS interception in network appliances), ZDNet & Slashdot https://www.zdnet.com/article/its-2018-and-network-middleware-still-cant-handle-tls-without-breaking-encryption/ & https://tech.slashdot.org/story/18/10/08/186222/network-middleware-still-cant-handle-tls-without-breaking-encryption
2018/11/28	Enterprise TLS proxy analysis (This is related to our ASIACCS 2018 paper entitled: To intercept or not to intercept: Analyzing TLS interception in network appliances), eForensics Magazine (https://eforensicsmag.com/good-enough-security-redux-ssl-inspection-devices-can-make-networks-less-secure-by-christopher-louie/)

- 2018/10/09 Enterprise TLS proxy analysis (This is related to our ASIACCS 2018 paper entitled: To intercept or not to intercept: Analyzing TLS interception in network appliances), InformationSecurityBuzz (<https://www.informationsecuritybuzz.com/expert-comments/network-middleware/>)
- 2018/09/27 Enterprise TLS proxy analysis (This is related to our ASIACCS 2018 paper entitled: To intercept or not to intercept: Analyzing TLS interception in network appliances), TheRegister.co.uk (https://www.theregister.co.uk/2018/09/27/tls_proxies_still_mostly_rubbish_say_canadian_infosec_boffins/)
- 2017/07/19 Blockchain-based Anonymous Delivery Systems (This is related to our PST-2017 paper entitled: Lelantos: A Blockchain-based Anonymous Physical Delivery System), Post & parcel (<https://postandparcel.info/82183/news/parcel/anonymous-deliveries/>)
- 2017/07/18 Blockchain-based Anonymous Delivery Systems (This is related to our PST-2017 paper entitled: Lelantos: A Blockchain-based Anonymous Physical Delivery System), CoinTelegraph (<https://cointelegraph.com/news/anonymous-deliveries-canada-introduces-blockchain-tor-based-delivery-system>)
- 2017/07/17 Blockchain-based Anonymous Delivery Systems (This is related to our PST-2017 paper entitled: Lelantos: A Blockchain-based Anonymous Physical Delivery System), Naked Security (<https://nakedsecurity.sophos.com/2017/07/17/what-does-imogen-heap-have-in-common-with-mail-the-blockchain/>)

Publications

Journal Articles

1. Shobir B, Mannan M, Youssef A. (2023). CDN's Dark Side: Security Problems in CDN-to-Origin Connections. ACM Digital Threats: Research and Practice (DTRAP) journal. 4(1): 1-22.
Published
Refereed?: Yes, Open Access?: No
2. Elbayoumi, Mohammed; Ibrahim, Mohamed; Elhoushy, Salah; Hamouda, Walaa; Youssef, Amr. (2023). Performance Analysis of Cellular Ultra Dense IoT Networks With Wireless Backhalls. IEEE Internet of Things Journal. 10(17): 15774-15787.
Published
Refereed?: Yes, Open Access?: No
3. AlTawy, Riham ; Galal, Hisham; Youssef, Amr. (2023). Mjolnir: Breaking the Glass in a Publicly Verifiable yet Private Manner. IEEE Transactions on Network and Service Management. 20(3): 2942 -2956.
Published
Refereed?: Yes, Open Access?: No
4. Tejaswi, Bhaskar; Mannan, Mohammad; Youssef, Amr. (2023). Weaknesses in IoT Management Platforms. IEEE Internet of Things Journal.
Accepted
Refereed?: Yes, Open Access?: No
5. Khan, Omniyah; Youssef, Amr; Salama, Magdy; Elsaadany, Ehab. (2023). Management of Congestion in Distribution Networks utilizing Demand Side Management and Reinforcement Learning. IEEE Systems Journal. 17(3): 4452-4463.
Published
Refereed?: Yes, Open Access?: No

6. Mahmoud, Moustafa ; Mannan, Mohammad ; Youssef, Amr. (2023). APThunter: Detecting Advanced Persistent Threats in Early Stages. Digital Threats: Research and Practice (DTRAP). 4(1): 1-31.
Published
Refereed?: Yes
7. Seifelnasr, Mohamed; AlTawy, Riham; oussef, Amr; Ghadaf, Essam i. (2023). Privacy-Preserving Mutual Authentication Protocol With Forward Secrecy for IoT-Edge-Cloud. IEEE Internet of Things Journal.
Accepted
Refereed?: Yes, Open Access?: No
8. Khan, Omniyah; Youssef, Amr; Salama, Magdy; El-Saadany, Ehab. (2023). Robust Multi-Objective Congestion Management in Distribution Network. IEEE Transactions on Power Systems. 38(4): 3568-3579.
Published
Refereed?: Yes
9. Seifelnasr, Mohamed; AlTawy, Riham ; Youssef, Amr. (2023). SKAFS: Symmetric Key Authentication Protocol with Forward Secrecy for Edge Computing. IEEE Internet of Things Journal.
Accepted
Refereed?: Yes, Open Access?: No
10. Saber, Ahmad; Youssef, Amr; Svetinovic, Davor ; Zeineldin, Hatem; El-Saadany, Ehab. (2023). Cyber-Immune Line Current Differential Relays. IEEE Transactions on Industrial Informatics.
Accepted
Refereed?: Yes, Open Access?: No
11. Galal, Hisham; Youssef, Amr. (2022). Aegis: Privacy-Preserving Market for Non-Fungible Tokens. IEEE Transactions on Network Science and Engineering,. 10(1): 92-102.
Published
Refereed?: Yes, Open Access?: No
12. Saber, A; Youssef, A; Svetinovic, D; Zeineldin, H; El-Saadany, E. (2022). Anomaly-Based Detection of Cyberattacks on Line Current Differential Relays. IEEE Transactions on Smart Grid. 13(6): 4787-4800.
Published
Refereed?: Yes, Open Access?: No
13. Nakkar, Mouna; AlTawy, Riham; Youssef, Amr. (2022). GASE: A Lightweight Group Authentication Scheme with Key Agreement for Edge Computing Applications. IEEE Internet of Things Journal. 10(1): 840-854.
Published
Refereed?: Yes
14. Albarakati A, Robillard C, Karanfil M, Kassouf M, Debbabi M, Youssef A, Ghafouri M, Hadjidj R. (2022). Security Monitoring of IEC 61850 Substations Using IEC 62351-7 Network and System Management. IEEE Transactions on Industrial Informatics. 18(3): 1641-1653.
Published
Refereed?: Yes, Open Access?: No
15. Elbayoumi, M; Hamouda, W; Youssef, A. (2022). Edge Computing and Multiple-Association in Ultra-Dense Networks: Performance Analysis. IEEE Transactions on Communications. 70(8): 5098-5112.
Published
Refereed?: Yes, Open Access?: No
16. Lucia W, Youssef A. (2022). A Key Agreement Scheme for Cyber-Physical Systems. IEEE Transactions on Systems, Man and Cybernetics: Systems. 52(8): 5368-5373.
Published
Refereed?: Yes, Open Access?: No
17. Naseri, A; Lucia, W; Youssef, A. (2022). Confidentiality attacks against encrypted control systems.Cyber-Physical Systems. 9(3): 224-243.
Published
Refereed?: Yes, Open Access?: No

18. Galal, H; Mannan, M; Youssef, A. (2022). Blindfold: Keeping private keys in PKIs and CDNs out of sight. *Computers & Security*. 118: 1-10.
Published
Refereed?: Yes, Open Access?: No
19. Naseri, A; Lucia, A; Youssef, A. (2022). Encrypted Cloud-Based Set-Theoretic Model Predictive Control. *IEEE Control Systems Letters*. 6: 3032 - 3037.
Published
Refereed?: Yes, Open Access?: No
20. Lucia W, Youssef A. (2021). Covert Channels in Stochastic Cyber-Physical Systems. *IET Cyber-Physical Systems: Theory & Applications*. 6(4): 228-237.
Published
Refereed?: Yes, Open Access?: Yes
21. Ali A, Elgharabawy M, Duchaussoy Q, Mannan M, Youssef A. (2021). Parental controls – Safer Internet solutions or new pitfalls?. *IEEE Security & Privacy Magazine*. 19(6): 36-46.
Published
Refereed?: Yes, Open Access?: No
22. Cabana O, Youssef A, Debbabi M, Lebel B, Kassouf M, Atallah A, Agba B. (2021). Threat Intelligence Generation using Network Telescope Data for Industrial Control Systems. *IEEE Transactions on Information Forensics & Security*. 16: 3355-3370.
Published
Refereed?: Yes, Open Access?: No
23. Seifelnasr M, AlTawy R, Youssef A. (2021). Efficient Inter-cloud Authentication and Micropayment Protocol for IoT Edge Computing. *IEEE Transactions on Network and Service Management*. 18(4): 4420-4433.
Published
Refereed?: Yes, Open Access?: No
24. Khan O, El-Saadany E, Youssef A, Shaaban M. (2021). Cyber Security of Market-based Congestion Management Methods in Power Distribution Systems. *IEEE Transactions on Industrial Informatics*. 17(2): 8142-8153.
Published
Refereed?: Yes, Open Access?: No
25. Elbayoumi M, Hamouda W, Youssef A. (2021). Multiple-Association Supporting HTC/MTC in Limited-Backhaul Capacity Ultra-Dense Networks. *IEEE Transactions on Communications*. 69(6): 4113-4127.
Published
Refereed?: Yes, Open Access?: No
26. Ameli A, Ayad A, El-Saadany E, Salama M, Youssef A. (2020). A Learning-Based Framework for Detecting Cyber-Attacks Against Line Current Differential Relays. *IEEE Transactions on Power Delivery*. 36(4): 2274-2286.
Published
Refereed?: Yes
27. Kamel M*, Hamouda W, Youssef A. (2020). Uplink Performance of NOMA-based Combined HTC and MTC in Ultra-Dense Networks. *IEEE Internet of Things Journal*. 7(8): 7319-7333.
Published
Refereed?: Yes, Open Access?: No
28. Nakkar M*, AlTawy A, Youssef A. (2020). Lightweight broadcast authentication protocol for edge-based applications. *IEEE Internet of Things Journal*. 7(12): 11766-11777.
Published
Refereed?: Yes, Open Access?: No

29. Elbayoumi M*, Kamel M*, Hamouda W, Youssef A. (2020). NOMA-assisted machine-type communications in UDN: State-of-the-Art and challenges. *IEEE Communications Surveys & Tutorials*. 22(2): 1276-1304.
Published
Refereed?: Yes, Open Access?: No
30. Abdelwahab A*, Lucia W, Youssef A. (2020). Covert Channels in Cyber-Physical Systems. *IEEE Control Systems Letters*. 5(4): 1273-1278.
Published
Refereed?: Yes, Open Access?: No
31. Waked L, Mannan M, Youssef A. (2020). The Sorry State of TLS Security in Enterprise Interception Appliances. *ACM Digital Threats: Research and Practice (DTRAP)*. 1(2): 1-26.
Published
Refereed?: Yes, Open Access?: No
32. Ayad A, Farag H, ;Youssef A, El-Saadany E. (2020). Cyber-physical attacks on power distribution systems. *IET Cyber-Physical Systems: Theory & Applications*. 5(2): 218-225.
Published
Refereed?: Yes, Open Access?: Yes
33. Lucia W, Youssef A. (2020). Wyner wiretap-like encoding scheme for cyber-physical systems. *IET Cyber-Physical Systems: Theory & Applications*. 5(4): 359-365.
Published
Refereed?: Yes, Open Access?: Yes
34. Osman T, Mannan M, Hengartner U, Youssef A. (2020). Securing Applications against Side-channel Attacks through Resource Access Veto. *Digital Threats: Research and Practice*. 1(4): 1-29.
Published
Refereed?: Yes
35. Kamel M*, Hamouda W, Youssef A. (2020). Uplink Coverage and Capacity Analysis of mMTC in Ultra-Dense Networks. *IEEE Transactions on Vehicular Technology (Impact Factor 5.339)*. 69(1): 746-759.
Published
Refereed?: Yes, Open Access?: No
36. Khalaf M*, Youssef A, El-Saadany E. (2019). Joint detection and mitigation of false data injection attacks in AGC systems. *IEEE Transactions on Smart Grid (Impact Factor 10.49)*. 10(5): 4985 - 4995.
Published
Refereed?: Yes
37. Ameli A*, Hooshyar A, El-Saadany E, Youssef A. (2019). An Intrusion Detection Method for Line Current Differential Relays. *IEEE Transactions on Information Forensics and Security (Impact Factor 6.21)*. 15: 329-344.
Published
Refereed?: Yes
38. Shasha S*, Moustafa M*, Mannan M, Youssef A. (2018). Playing With Danger: A Taxonomy and Evaluation of Threats to Smart Toys. *IEEE Internet of Things Journal (Impact Factor 9.515)*. 6(2): 2986-3002.
Published
Refereed?: Yes
39. Ameli A*, Hooshyar A, Yazdavar H, El-Saadany E, Youssef A. (2018). Attack detection for load frequency control systems using stochastic unknown input estimators. *IEEE Transactions on Information Forensics and Security (Impact Factor 6.21)*. 13(10): 2575-2590.
Published
Refereed?: Yes

40. Elsheikh M*, Tolba M*, Youssef A. (2018). Impossible Differential Attack on Reduced Round SPARX-128/256. IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences (Special Section on Cryptography and Information Security). 101(4): 731-733.
Published
Refereed?: Yes
41. Ameli A*, Hooshyar A, El-Saadany E, Youssef A. (2018). Attack detection and identification for automatic generation control systems. IEEE Transactions on Power Systems (Impact Factor 6.807). 33(5): 4760-4774.
Published
Refereed?: Yes
42. Abdelkhalek A* and Tolba M*, Youssef A. (2018). Related-key differential attack on round-reduced Bel-T-256. IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences (Special Section on Cryptography and Information Security). 101(5): 859-862.
Published
Refereed?: Yes

Books

1. Nitaj A, Youssef A. (2020). Progress in Cryptology–AFRICACRYPT 2020. (12174)Nitaj A, Youssef A.
Published, Springer
Refereed?: Yes
2. Alrabaee S, Debbabi M, Shirani P, Wang L, Youssef A, Rahimian A, Nouh L, Mouheb D, Huang H, Hanna A. (2020). Binary Code Fingerprinting for Cybersecurity: Application to Malicious Code Fingerprinting. : 248.
Published, Springer
Refereed?: Yes

Book Chapters

1. Ragab, Abdelrahman; Mannan, Mohammad ; Youssef, Amr. (2023). Try on, Spied on? : Privacy Analysis of Virtual Try-On Websites and Android Apps. Proceedings of 17th DPM International Workshop on Data Privacy Management, 2023 ESORICS 2022 International Workshops. : 1-17.
Accepted, Springer
Refereed?: Yes
2. Samarasinghe, Nayanamana; Kapoor, Pranay; Mannan, Mohammad; Youssef, Amr. (2022). No salvation from trackers: Privacy analysis of religious websites and mobile apps. 16th DPM International Workshop on Data Privacy Management, ESORICS 2022 International Workshops. (13619): 1-16.
Accepted, Springer
Refereed?: Yes
3. ElSheikh, M; Youssef, A. (2022). Dispute-free Scalable Open Vote Network using zk-SNARKs. Financial Cryptography Workshops (WTSC 2022 : 6th Workshop on Trusted Smart Contracts). : 1-17.
Accepted, Springer
Refereed?: Yes
4. Elsheikh M, Youssef M. (2021). On MILP-based Automatic Search for Bit-Based Division Property for Ciphers with (large) Linear Layers. Baek , Ruj S. Proceedigs of the 26th Australasian Conference on Information Security and Privacy, ACISP 2021 (Acceptance rate 36/150). (13083): 111-131.
Published, Springer
Refereed?: Yes

5. Galal H, Youssef A. (2021). Publicly Verifiable and Secrecy Preserving Periodic Auctions. Financial Cryptography and Data Security. FC 2021 International Workshops. (12676): 348-363.
Published, Springer
Refereed?: Yes
6. Seifelnasr M, Galal H, Youssef A. (2020). Scalable Open-Vote Network on Ethereum. Financial Cryptography and Data Security. FC 2020 Workshops. (12063): 436-450.
Published, Springer
Refereed?: Yes
7. Tolba M*, EISheikh M*, Youssef A. (2020). Impossible Differential Cryptanalysis of Reduced-Round Tweakable TWINE. Progress in Cryptology - AFRICACRYPT 2020. (12174): 91-113.
Published, Springer
Refereed?: Yes
8. EISheikh M*, Youssef A. (2020). Integral Cryptanalysis of Reduced-Round Tweakable TWINE. Stephan K, Haya S, Serg V. 19TH INTERNATIONAL CONFERENCE ON CRYPTOLOGY AND NETWORK SECURITY (CANS 2020). (12579): 1-20.
In Press, Springer
Refereed?: Yes
9. Galal H, Youssef A. (2020). Preserving Netting Protocol for Inter-bank Payments. Proceeding of Data Privacy Management, Cryptocurrencies and Blockchain Technology. DPM 2020, CBT 2020. (12484): 319-334.
Published, Springer
Refereed?: Yes
10. Elsheikh M*, Youssef A. (2019). Related-key Differential Cryptanalysis of Full Round CRAFT. International Conference on Security, Privacy and Applied Cryptographic Engineering. Lecture Notes in Computer Science: 1-17.
In Press, Springer
Refereed?: Yes
11. Galal H*, Youssef A. (2019). Trustee: Full Privacy Preserving Vickrey Auction on top of Ethereum. Financial Cryptography and Data Security workshops (FC 2019). Lecture Notes in Computer Science(11599): 1-18.
In Press, Springer
Refereed?: Yes
12. EISheikh M*, Clark J, Youssef A. (2019). Deploying PayWord on Ethereum. Financial Cryptography and Data Security workshops (FC 2019). Lecture Notes in Computer Science(11599): 1-11.
In Press, Springer
Refereed?: Yes
13. Ali S*, Osman T*, Mannan M, Youssef A. (2019). On Privacy Risks of Public WiFi Captive Portals. Proceedings of ESORICS 2019 International Workshops, DPM 2019 and CBT 2019. Lecture Notes in Computer Science(11737): 1-18.
Accepted, Springer
Refereed?: Yes
14. Galal H*, Elsheikh M*, Youssef A. (2019). An Efficient Micropayment Channel on Ethereum. Proceedings of ESORICS 2019 International Workshops, DPM 2019 and CBT 2019. Lecture Notes in Computer Science(11737): 1-8.
In Press, Springer
Refereed?: Yes

15. Cabana O*, Youssef A, Debbabi M, Lebel B, Kassouf M, Agba L. (2019). Detecting, Fingerprinting and Tracking Reconnaissance Campaigns Targeting Industrial Control Systems. Detection of Intrusions and Malware, and Vulnerability Assessment. DIMVA 2019 (Acceptance Rate: 23/80). Lecture Notes in Computer Science(11564): 89-108.
Published, Springer
Refereed?: Yes
16. ElSheikh M*, Abdelkhalek A*, Youssef A. (2019). On MILP-Based Automatic Search for Differential Trails Through Modular Additions with Application to Bel-T. Buchmann J, Nitaj A, Rachidi T. Progress in Cryptology – AFRICACRYPT 2019 (Acceptance Rate: 22/53). Lecture Notes in Computer Science(11627): 273-296.
Published, Springer
Refereed?: Yes
17. Galal H*, Youssef A. (2018). Verifiable Sealed-Bid Auction on the Ethereum Blockchain. Financial Cryptography and Data Security Workshops (FC 2018). Lecture Notes in Computer Science(10958): 265-278.
Published, Springer
Refereed?: Yes
18. ElSheikh M*, Tolba M*, Youssef A. (2018). Integral Attacks on Round-Reduced Bel-T-256. Areas in Cryptography – SAC 2018 (Acceptance Rate 21/56). Lecture Notes in Computer Science(11349): 73-91.
Published, Springer
Refereed?: Yes
19. Tolba M*, Abdelkhalek A*., Youssef A. (2018). Multidimensional zero-correlation linear cryptanalysis of reduced round SPARX-128. Selected Areas in Cryptography – SAC 2017. SAC 2017 (Acceptance Rate: 23/66). Lecture Notes in Computer Science(10719): 423-441.
Published, Springer
Refereed?: Yes
20. Duman O*, Youssef A. (2018). Fault Analysis of the New Ukrainian Hash Function Standard: Kupyna. Foundations and Practice of Security. FPS 2018 (Acceptance Rate: 15/47). Lecture Notes in Computer Science(11358): 225-240.
Published, Springer
Refereed?: Yes
21. Abdelkhalek A*, Tolba M*, Youssef A. (2018). Recent trends in the cryptanalysis of block ciphers. Information Security: Foundations, Technologies and Applications. : 241-277.
Published, The Institution of Engineering and Technology (IET)
Refereed?: Yes
22. Galal H*, Youssef A. (2018). Succinctly Verifiable Sealed-Bid Auction Smart Contract. Data Privacy Management, Cryptocurrencies and Blockchain Technology. DPM 2018, CBT 2018. Lecture Notes in Computer Science(11025): 3-19.
Published, Springer
Refereed?: Yes

Conference Publications

1. Pagey, Rohan; Mannan, Mohammad; Youssef, Amr. (2023). All Your Shops Are Belong to Us: Security Weaknesses in E-commerce Platforms. The Web Conference 2023, (Acceptance rate 365/1900=19.2%), (1-11)
Paper
Accepted
Refereed?: Yes, Invited?: No

2. Baskaran, Supraja; Zhao, Lianying; Mannan, Mohammad; Youssef, Amr. (2023). Measuring the Leakage and Exploitability of Authentication Secrets in Super-apps: The WeChat Case. ACM. The 26th International Symposium on Research in Attacks, Intrusions and Defenses (RAID 2023) (Acceptance ratio 50/213)., Paper
Accepted
Refereed?: Yes, Invited?: No
3. Saber, Ahmad; Youssef, Amr; Svetinovic, Davor; Zeineldin, Hatem; El-Saadany, Ehab. (2023). Learning-Based Detection of Malicious Volt-VAr Control Parameters in Smart Inverters. IEEE. 49th Annual Conference of the IEEE Industrial Electronics Society (IES),, Paper
Accepted
Refereed?: Yes, Invited?: No
4. Tejaswi, Bhaskar; Mannan, Mohammad ; Youssef, Amr. (2023). All Your IoT Devices Are Belong to Us: Security Weaknesses in IoT Management Platforms. ACM. The 13th ACM Conference on Data and Application Security and Privacy (CODASPY 2023)., (1-7)
Paper
Accepted
Refereed?: Yes, Invited?: No
5. Afia, Ismail; Galal, Hisham; Al-Tawy, Riham; Youssef, Amr. (2023). vPass: Publicly Verifiable Fair Exchange Protocol for Vehicle Passports. IEEE. IEEE International Conference on Blockchain and Cryptocurrency, (ICBC 2023)., Paper
Accepted
Refereed?: Yes, Invited?: No
6. Naseri, Amir; Lucia, Walter; Youssef, Amr. (2023). An Observer-Based Key Agreement Scheme for Remotely Controlled Mobile Robots. 22nd World Congress of the International Federation of Automatic Control (IFAC 2023), Paper
Accepted
Refereed?: Yes, Invited?: No
7. Elbayoumi, Mohammed; Hamouda, Walaa ; Youssef, Amr. (2023). Machine-Type Communication in mmWave Ultra-Dense Networks: Performance Analysis. IEEE. IEEE International Conference on Communications (ICC 2023), (1-6)
Paper
Accepted
Refereed?: Yes, Invited?: No
8. Yu, X; Samarasinghe, N; Mannan, M; Youssef, A. (2022). Got Sick and Tracked: Privacy Analysis of Hospital Websites. IEEE. 2022 IEEE European Symposium on Security and Privacy Workshops (EuroS&PW), (278-286)
Paper
Published
Refereed?: Yes, Invited?: No
9. Samarasinghe; N., Adhikari, A., Mannan, M; Youssef, A. (2022). Et tu, brute? Privacy analysis of government websites and mobile apps. ACM. ACM Web Conference (WWW), Acceptance Rate=323/1822 (17.7%)., (564-575)
Paper
Accepted
Refereed?: Yes, Invited?: No

10. Naseri, Amir; Lucia, Walter ; Youssef, Amr. (2022). Encrypted Cloud-Based Set-Theoretic Model Predictive Control. 61st IEEE Conference on Decision and Control, (1-6)
Paper
Accepted
Refereed?: Yes, Invited?: No
11. Kapoor,Pranay ; Pagey, Rohan; Mannan , Mohammad ; Youssef, Amr. (2022). Silver Surfers on the Tech Wave: Privacy Analysis of Android Apps for the Elderly. 18th EAI International Conference on Security and Privacy in Communication Networks, (1-18)
Paper
Accepted
Refereed?: Yes, Invited?: No
12. Tejaswi, Bhaskar ; Samarasinghe, Nayanamana; Pourali, Sajjad; Mannan, Mohammad ; Youssef, Amr. (2022). Leaky Kits: The Increased Risk of Data Exposure from Phishing Kits. Symposium on Electronic Crime Research (eCrime 2022), BEST PAPER AWARD, (1-13)
Paper
Accepted
Refereed?: Yes, Invited?: No
13. Kluban, M; Mannan, M; Youssef, A. (2022). On Measuring Vulnerable JavaScript Functions in the Wild. ACM. Asia Conference on Computer and Communications Security, (917-930)
Paper
Published
Refereed?: Yes, Invited?: No
14. Elgharabawy, M; Kojusner, B; Mannan, M; Butler, K; Williams, B; Youssef, A. (2022). SAUSAGE: Security Analysis of Unix domain Socket usage in Android. IEEE. 2022 IEEE 7th European Symposium on Security and Privacy (EuroS&P), (572-586)
Paper
Published
Refereed?: Yes, Invited?: No
15. Naseri, Amir; Lucia, Walter; Youssef, Amr. (2022). A Privacy Preserving Solution for Cloud-Enabled Set-Theoretic Model Predictive Control. IEEE. the 20th European Control Conference (ECC 2022), (894-899)
Paper
Published
Refereed?: Yes, Invited?: No
16. Elbayoumi M, Hamouda W, Youssef A. (2021). Ergodic Secrecy Rate Analysis of Ultra-Dense Networks with Multiple Antennas. IEEE 2021 International Conference on Communications (ICC 2021): Wireless Communications Symposium,
Paper
In Press
Refereed?: Yes, Invited?: No
17. Abdelwahab A, Lucia W, Youssef A. (2021). Covert Channels in Cyber-Physical Systems. American Control Conference (ACC 2021),
Paper
In Press
Refereed?: Yes, Invited?: No

18. Uddin S, Mannan M, Youssef A. (2021). Horus: A Security Assessment Framework for Android Crypto Wallets. 17th EAI International Conference on Security and Privacy in Communication Networks (SecureComm 2021),
Conference Date: 2021/9
Paper
In Press
Refereed?: Yes, Invited?: No
19. Naseri A, Lucia W, Mannan M, Youssef A. (2021). On securing cloud-hosted cyber-physical systems using trusted execution environments. The IEE International Conference on Autonomous Systems (IEEE ICAS 2021),
Conference Date: 2021/8
Paper
In Press
Refereed?: Yes, Invited?: No
20. Nakkar M, Altawy R, Youssef A. (2021). Lightweight Authentication and Key Agreement Protocol for Edge Computing Applications (**First place student paper contest**). 7th IEEE World Forum on Internet of Things, WF-IoT 2021,
Conference Date: 2021/7
Paper
In Press
Refereed?: Yes, Invited?: No
21. Khan O, Youssef A, El-Saadany E, Salama M. (2021). LSTM-based approach to detect cyber attacks on market-based congestion management methods. IEEE PES General Meeting Conference 2021,
Conference Date: 2021/7
Paper
In Press
Refereed?: Yes, Invited?: No
22. Kluban M, Mannan M, Youssef A. (2021). On Measuring Vulnerable JavaScript Functions in the Wild. 17th ACM ASIA Conference on Computer and Communications Security (AsiaCCS 2022), (Acceptance Rate=26/169),
Conference Date: 2021/5
Paper
Accepted
Refereed?: Yes, Invited?: No
23. Elbayoumi M*, Hamouda W*, Youssef A. (2020). Secrecy Performance in Ultra-Dense Networks with Multiple Associations. IEEE. IEEE GLOBECOM 2020 Workshop on 5G and Beyond Wireless Security, 2020., (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
24. Ali S*, Elgharabawy M*, Duchaussoy Q*, Mannan M, Youssef A. (2020). Betrayed by the Guardian: Security and Privacy Risks of Parental Control Solutions,. ACM. The 2020 Annual Computer Security Applications Conference (ACSAC 2020), ACM, Acceptance Rate(70/302=23%) Distinguished Paper Award.,
Conference Date: 2020/12
Paper
In Press
Refereed?: Yes, Invited?: No

25. Elbayoumi M*, Hamouda W, Youssef A. (2020). A Hybrid NOMA/OMA Scheme for MTC in Ultra-Dense Networks. IEEE. IEEE Global Communications Conference (GLOBECOM 2020), (1-5)
Conference Date: 2020/12
Paper
In Press
Refereed?: Yes, Invited?: No
26. Abdelwahab A*, Lucia W, Youssef A. (2020). Decoy-Based Moving Target Defense Against Cyber-Physical Attacks on Smart Grid. IEEE. IEEE Canada Electrical Power and Energy Conference (EPEC 2020)., (1-5)
Conference Date: 2020/11
Paper
In Press
Refereed?: Yes, Invited?: No
27. Seifelnasr M*, Nakkar M*, AITawy R, Youssef A. (2020). A Lightweight Authentication and Inter-cloud Payment Protocol for Edge Computing. IEEE. IEEE International Conference on Cloud Networking (CloudNet2020), (1-4)
Conference Date: 2020/11
Paper
Published
Refereed?: Yes, Invited?: No
28. Stobert E, Safaie T*, Molyneaux H, Mannan M, Youssef A. (2020). ByPass: Reconsidering the Usability of Password Managers. Springer. 16th EAI International Conference on Security and Privacy in Communication Networks (SecureComm 2020), (1-21)
Conference Date: 2020/10
Paper
In Press
Refereed?: Yes, Invited?: No
29. Abdelwahab A*, Lucia A, Youssef A. (2020). Set-Theoretic Control for Active Detection of Replay Attacks with Applications to Smart Grid. IEEE. 4th IEEE Conference on Control Technology and Applications, 2020., (1-5)
Conference Date: 2020/8
Paper
In Press
Refereed?: Yes, Invited?: No
30. Abdelwahab A*, Lucia W, Youssef A. (2020). A DoS-resilient Set-Theoretic Controller for Smart Grid Applications. IEEE. IEEE PES General Meeting Conference 2020., (1-5)
Conference Date: 2020/8
Paper
In Press
Refereed?: Yes, Invited?: No
31. Gul O*, El-Saadany E, Youssef A, Shaaban M. (2019). Impact of Electric Vehicles Botnets on the Power Grid. IEEE. IEEE Canada Electrical Power and Energy Conference (EPEC 2019), (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No

32. Albarakati A*, Robillard C*, Karanfil M*, Kassoufy M, Hadjidj R, Debbabi M, Youssef A. (2019). Security Monitoring of IEC 61850 Substations Using IEC 62351-7 Network and SystemManagement. IEEE. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), (1-6)
Paper
Accepted
Refereed?: Yes, Invited?: No
33. Khan O*, El-Saadany E, Saleh K, Shaaban M, Youssef A. (2019). Cyber Attacks On Distributed Congestion Management Methods. IEEE. IEEE Powe and Energy Society (PES) General Meeting Conference, (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
34. Khalaf M*, Youssef A, El-Saadany E, Salama M. (2019). Detection of False Data Injection Attacks on Wide-Area Under-Frequency Load Shedding Protection Schemes. IEEE. IEEE Canada Electrical Power and Energy Conference (EPEC 2019), (1-5)
Paper
Accepted
Refereed?: Yes, Invited?: No
35. Osman T*, Mannan M, Hengartne Ur, Youssef A. (2019). AppVeto: MobileApplication Self-Defense through Resource Access Veto. ACM. The 2019 Annual Computer Security Applications Conference (ACSAC 2019) (Acceptance Rate: 60/266), (1-11)
Paper
Accepted
Refereed?: Yes, Invited?: No
36. Elbayoumi M*, Kamel M*, Hamouda W*, Youssef A. (2019). Capacity Analysis of Downlink NOMA-Based Coexistent HTC/MTC in UDN. IEEE. International Conference on Communications, Signal Processing, and their Applications (ICCSPA 2019) (Best Paper Award), (1-6)
Paper
Published
Refereed?: Yes, Invited?: No
37. Kamel M*, Hamouda W, Youssef A. (2018). Uplink Coverage of Machine-Type Communications in Ultra-Dense Networks. IEEE. IEEE Global Communications Conference (GLOBECOM), (1-6)
Paper
Published
Refereed?: Yes, Invited?: No
38. Mahmoud M*, Hossen Z*, Barakat H*, Mannan M, Youssef A. (2018). Towards a comprehensive analytical framework for smart toy privacy practices. ACM. 7th Workshop on Socio-Technical Aspects in Security and Trust. (Best Paper Award), (64-75)
Paper
Published
Refereed?: Yes, Invited?: Yes
39. Khalaf M*, Youssef A, El-Saadany E. (2018). A Particle Filter-Based Approach for the Detection of False Data Injection Attacks on Automatic Generation Control Systems. IEEE. IEEE Electrical Power and Energy Conference (EPEC), (1-6)
Paper
Published
Refereed?: Yes, Invited?: No

40. Ayad A*, Farag H, Youssef A, El-Saadany E. (2018). Detection of false data injection attacks in smart grids using recurrent neural networks. IEEE. IEEE Power & Energy Society Innovative Smart Grid Technologies Conference (ISGT 2018), (1-5)
Paper
Published
Refereed?: Yes, Invited?: No
41. Waked L*, Mannan M, Youssef A. (2018). To intercept or not to intercept: Analyzing tls interception in network appliances. ACM. Asia Conference on Computer and Communications Security (ASIACCS 2018) (Acceptance Rate: 62/310), (399-412)
Paper
Published
Refereed?: Yes, Invited?: No
42. Albarakati A*, Moussa B, Debbabi M, Youssef A, Agba B, Kassouf M. (2018). OpenStack-Based Evaluation Framework for Smart Grid Cyber Security. IEEE. IEEE International Conference on Communications, Control, and Computing Technologies for Smart Grids (SmartGridComm), (1-6)
Paper
Published
Refereed?: Yes, Invited?: No

Intellectual Property

Licenses

1. Professional Engineer, Ontario
Granted
Date Issued: 2005/12



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Professor Yong Zeng

Correspondence language: English

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The primary information is denoted by (*)

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Professor Yong Zeng

Language Skills

Language	Read	Write	Speak	Understand	Peer Review
English	Yes	Yes	Yes	Yes	Yes
French	No	No	No	No	No

Degrees

- 2001/11 Doctorate, Design Theory and Methodology, The University of Calgary
Supervisors: Peihua Gu, 1998/5 - 2001/7
- 1992/8 Doctorate, Finite Element Modeling, Dalian University of Technology
Supervisors: Gengdong Cheng, 1989/9 - 1992/7
- 1989/9 Master's Thesis, Finite Element Modeling, Dalian University of Technology
Supervisors: Gengdong Cheng, 1986/9 - 1989/7
- 1986/7 Bachelor's, Structural Engineering, Logistical Engineering University
Supervisors: Shengkun Wang, 1986/2 - 1986/7

Recognitions

- 2021/2 Fellow
The International Society for the Study of Creativity and Innovation
Distinction
Internationally leading researchers were nominated by one society fellow and approved by the board of directors of the society.
- 2017/1 - 2020/6 NSERC Chair in Aerospace Design Engineering
Natural Sciences and Engineering Research Council of Canada (NSERC)
Prize / Award
The core objective of the NSERC Chair in Aerospace Design Engineering (NCADE) is to increase the quality and quantity of Concordia University's engineering graduates prepared for employment as design engineers in Canada's aerospace industry. The research program focuses on research activities in the design and development of processes and methodologies that can deliver the right product at the right time in the unique context of the aerospace industry.

User Profile

Research Specialization Keywords: Behaviour change, conceptual design, design creativity, design methodology, design science, design theory, experimental approach, formal approach, human factors engineering,

neurocognitive science, nonparametric clustering, Policy design, reinforcement learning, requirements engineering, software engineering

Employment

2010/6	Professor Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University Full-time Tenure Status: Tenure
2003/8 - 2010/5	Associate Professor Concordia Institute for Information Systems Engineering, Engineering and Computer Science, Concordia University Full-time Tenure Status: Tenure
2002/2 - 2003/7	Research Associate Integrated Manufacturing Technologies Institute, National Research Council Canada
2001/7 - 2002/1	Postdoctoral Fellow or Associate Mechanical & Manufacturing Engineering, Faculty of engineering, The University of Calgary Full-time Tenure Status: Non Tenure Track

Research Funding History

Awarded [n=5]

2021/4 - 2025/3 Co-applicant	Generating EMR-Based Algorithms to Identify Hospital Adverse Events for Health System Performance Evaluation and Improvement, Grant Funding Sources: Canadian Institutes of Health Research (CIHR) Project Grant Total Funding - 1,189,576 Portion of Funding Received - 200,000 Funding Competitive?: Yes Co-applicant : Catherine Ann Eastwood; Principal Applicant : Yuan Xu
2019/4 - 2024/3 Principal Applicant	AdaptiveCAD: Shifting CAD Paradigm for Innovative and Creative Design, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Grant Total Funding - 230,000 Portion of Funding Received - 100 Funding Competitive?: Yes
2022/4 - 2024/3 Principal Investigator	Optimizing workload assignment to overcome workplace procrastination, Grant Funding Sources: Concordia University OVRPGS/Team Grant Total Funding - 50,000 Portion of Funding Received - 50,000

	Funding Competitive?: Yes
2020/9 - 2023/8 Principal Investigator	AI + Waste to Resources Management toward Sustainable City, Grant Funding Sources: Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT) NSFC-FQR Total Funding - 120,000 Portion of Funding Received - 60,000 Funding Competitive?: Yes Co-investigator : Jun Yan; Nadia Bhuiyan
2022/2 - 2023/1 Co-applicant	Make healthy changes easy: AI-enabled dialogue-driven app for personalized cancer prevention – risk dialogue, Grant Funding Sources: Canadian Cancer Society CCS/CIHR Action Grants Total Funding - 200,000 Portion of Funding Received - 93,750 Funding Competitive?: Yes
Completed [n=7]	
2018/3 - 2021/2 Principal Investigator	Biometric Approaches to Inferring Pilot Trainee's Affective and Cognitive States, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) CRD Total Funding - 1,171,800 Portion of Funding Received - 540,800 Funding Competitive?: Yes Co-applicant : Jocelyn Faubert; Susanne Lajoie; Collaborator : Ali Akgunduz; Weiping Zhu
2015/7 - 2020/6 Co-investigator	NSERC Design Chair in Aerospace Design Engineering, Research Chair Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) CDE Total Funding - 2,425,000 Portion of Funding Received - 436,000 Funding Competitive?: Yes
2014/5 - 2019/4 Principal Investigator	Environment-Based Design Methodology for Creative Design, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) DG Total Funding - 120,000 Portion of Funding Received - 120,000 Funding Competitive?: Yes
2014/5 - 2019/4 Co-investigator	Lean Aerospace Value Streams, Grant Funding Sources: Natural Sciences and Engineering Research Council of Canada (NSERC) CRD Total Funding - 1,020,000

Portion of Funding Received - 258,720

Funding Competitive?: Yes

Co-applicant : Christian Mascle; K Demirli; Yvan Beauregard;

Principal Applicant : Nadia Bhuiyan

2018/6 - 2018/9

Principal Investigator

Environment-Based Design (EBD) Application to Mechanical Products, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

GlobLink

Total Funding - 6,000

Portion of Funding Received - 6,000

Funding Competitive?: Yes

2018/7 - 2018/9

Principal Investigator

Measurement of Student Competencies in a Teamwork, Grant

Funding Sources:

Mathematics of Information Technology and Complex Systems (MITACS)

GlobLink

Total Funding - 6,000

Portion of Funding Received - 6,000

Funding Competitive?: Yes

2018/3 - 2018/9

Principal Investigator

Improvement of Valtech Workflow: A Pilot Study, Grant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)

Engage

Total Funding - 25,000

Portion of Funding Received - 25,000

Funding Competitive?: Yes

Student/Postdoctoral Supervision

Bachelor's [n=2]

2018/6 - 2018/8

Principal Supervisor

Jeremy Weng (Completed) , University of Virginia

Thesis/Project Title: Website Development

Present Position: Software developer, A government organization of US in Washington DC

2018/5 - 2018/9

Principal Supervisor

Mumu Gloria Wang (Completed) , Concordia University

Thesis/Project Title: Humor and Creative Design

Present Position: Student, Concordia University

Master's Thesis [n=17]

2023/1 - 2024/12

Principal Supervisor

Jiami Yang (In Progress) , Concordia University

Student Degree Expected Date: 2024/4

Thesis/Project Title: Behaviour change framework: TASKS

Present Position: Master's student, Concordia University

2022/9 - 2024/8

Co-Supervisor

Christopher Neves (In Progress) , Concordia University

Student Degree Expected Date: 2024/8

Thesis/Project Title: GNN for analyzing EEG signals

Present Position: Master's student, Concordia University

- 2021/9 - 2023/8
Principal Supervisor Amin Bayatpour (In Progress) , Concordia University
Thesis/Project Title: Natural language processing
Present Position: Master's student, Concordia University
- 2019/9 - 2021/8
Co-Supervisor Shohre Khoddami (Completed) , Concordia University
Thesis/Project Title: A System Dynamics Approach to Comparative Analysis of Biomass Supply Chain Coordination Strategies
Present Position: Project management specialist- Project Planner, GE Renewable Energy
- 2019/7 - 2021/9
Principal Supervisor Yanxin Yao (Completed) , Concordia
Thesis/Project Title: Biometric measurement of operator's cognitive states
Present Position: Software developer, A company in China
- 2018/9 - 2020/9
Principal Supervisor Jamil Reza Chowdhury (Completed) , Concordia University
Thesis/Project Title: Algorithms to Remove EEG Artifacts
Present Position: Software developer, J Morgan
- 2018/5 - 2019/9
Principal Supervisor Chang Su (Completed) , Concordia University
Thesis/Project Title: EEG Expressions of Designer's Gestures and Body Movements in Conceptual Design Process
Present Position: PhD Student, Concordia University
- 2017/9 - 2019/9
Co-Supervisor Shixuan Hou (Completed) , Concordia University
Thesis/Project Title: A Dynamic Two-Sided Matching Algorithm in a Changing Labour Market
Present Position: PhD Student, Concordia University
- 2017/9 - 2019/9
Principal Supervisor Yuyang Shi (Completed) , Concordia University
Thesis/Project Title: A Service Design Framework Based on EBD and TRIZ
Present Position: Quality engineering, A company in Beijing
- 2017/9 - 2021/1
Principal Supervisor Alexandra Milkin (Completed) , Concordia University
Thesis/Project Title: EBD Enabled Requirements Modeling for New Product Development in Aerospace Design
Present Position: Quality specialist, KS2 Corp
- 2017/1 - 2019/8
Co-Supervisor Seyed Reza Razavi (Completed) , Concordia University
Thesis/Project Title: Analysis of Product Evolution Using EBD
Present Position: Quality manager, An engineering company in Montreal
- 2016/9 - 2018/12
Principal Supervisor Amir Ali Ommi (Completed) , Concordia University
Thesis/Project Title: Designing the Design Team
Present Position: Senior Product Manager, Paper Edu
- 2016/5 - 2018/4
Principal Supervisor Dalvir Singh (Completed) , Concordia University
Thesis/Project Title: To Investigate Power of Brain Activity Using EEG Comparison Between Creative and Non-creative Design Task
Present Position: Technician, ROOT Data Center, Montreal
- 2016/5 - 2018/8
Principal Supervisor Shahryar Taheri (Completed) , Concordia University
Thesis/Project Title: Investigation of Assessment Methods for Measuring the Effectiveness of Student Design Learning
Present Position: Unknown
- 2015/5 - 2017/4
Principal Supervisor Lixin Liu (Completed) , Concordia University
Thesis/Project Title: Investigation into Neurological Foundation of Synthesis and Evaluation Activities in Conceptual Design
Present Position: Consultant, Montreal

- 2015/1 - 2017/8
Principal Supervisor Mengli Shu (Completed) , Concordia University
Thesis/Project Title: Quality Function Deployment Integration with Design Methodologies
Present Position: IT consultant, Morgan Stanley, Montreal
- 2014/9 - 2017/4
Principal Supervisor Yi Dou (Completed) , Concordia University
Thesis/Project Title: Artifact Analysis and Removal of Electroencephalographic (EEG) Recordings
Present Position: RA, Central China Normal University
- Doctorate [n=14]**
- 2022/1 - 2025/5
Principal Supervisor Morteza Zangeneh Soroush (In Progress) , Concordia University
Thesis/Project Title: EEG analysis of creative activities
Present Position: PhD student, Concordia University
- 2022/1 - 2025/4
Principal Supervisor Hamed Shirazi (In Progress) , Concordia University
Thesis/Project Title: Behaviour design to overcoming procrastination
Present Position: PhD student, Concordia University
- 2021/9 - 2024/12
Co-Supervisor Rupinder Kaur (In Progress) , Concordia University
Thesis/Project Title: EBD driven education design
Present Position: PhD student, Concordia University
- 2021/9 - 2024/8
Principal Supervisor Jinli Yao (In Progress) , Concordia University
Thesis/Project Title: Nonparametric clustering
Present Position: PhD student, Concordia University
- 2021/9 - 2024/12
Principal Supervisor Ali Mohammadi (In Progress) , Concordia University
Thesis/Project Title: Design methodology for innovative design
Present Position: PhD student, Concordia University
- 2020/9 - 2023/8
Principal Supervisor Chang Su (In Progress) , Concordia University
Thesis/Project Title: Quantification of mental stresses in complex cognitive activities
Present Position: PhD student, Concordia University
- 2020/1 - 2023/12
Co-Supervisor Hamed Jafarpour (In Progress) , Concordia
Thesis/Project Title: Machine learning algorithms to identify adverse events from EMRs
Present Position: PhD student
- 2018/9 - 2022/8
Principal Supervisor Cheligeer (Completed) , Concordia University
Thesis/Project Title: An EBD-enabled design knowledge acquisition framework
Present Position: Senior Data Scientist, Alberta Health Services
- 2018/9 - 2022/2
Principal Supervisor Hongyi Cao (Completed) , Concordia University
Thesis/Project Title: A design science enabled organizational capability state measurement approach
Present Position: Research scientist, China Ministry of Environment and Ecosystems
- 2017/1 - 2022/12
Principal Supervisor Mengting Zhao (Completed) , Concordia University
Thesis/Project Title: Capability zone and equilibrium in task accomplishment
Present Position: Postdoctoral fellow, Concordia University
- 2016/9 - 2021/8
Principal Supervisor Jie Pan (In Progress) , Concordia University
Student Degree Expected Date: 2021/11
Thesis/Project Title: Rule-based machine learning algorithms for smart automatic quadrilateral mesh generation system
Present Position: Postdoctoral Fellow, Center for Health Informatics, University of Calgary

- 2016/9 - 2020/8
Principal Supervisor Wenjun Jia (Completed) , Concordia University
Thesis/Project Title: Investigating neurocognition in design creativity under loosely controlled experiments supported by EEG microstate analysis
Present Position: Researcher, Lingang Laboratory, Shanghai, China
- 2014/9 - 2017/4
Principal Supervisor Philon Nguyen (Completed) , Concordia University
Thesis/Project Title: Approaches to Quantifying EEG Features for Design Protocol Analysis
Present Position: President/Consultant, Qtech, Montreal
- 2010/9 - 2017/4
Principal Supervisor Suo Tan (Completed) , Concordia University
Thesis/Project Title: Roles of Perception in Engineering Design – A Theoretical Foundation to Improve Designer’s Performance
Present Position: Business Intelligence Developer, Playtika (Canada), Montreal

Post-doctorate [n=1]

- 2021/11 - 2022/10
Principal Supervisor Jie Pan (Completed) , Concordia
Thesis/Project Title: Unsupervised learning
Present Position: Postdoctoral Fellow, Center for Health Informatics, University of Calgary

Certificate [n=8]

- 2018/4 - 2018/6
Principal Supervisor Margarita Tinoco (Completed) , Lester B. Pearson Center
Thesis/Project Title: Website Development
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Wenxin Ma (Completed) , Lester B. Pearson Center
Thesis/Project Title: Website Development
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Maria Rotaru (Completed) , Lester B. Pearson Center
Thesis/Project Title: Website Development
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Eom Chung Yong (Completed) , Lester B. Pearson Center
Thesis/Project Title: Website Development
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Kwang Ho Kim (Completed) , Lester B. Pearson Center
Thesis/Project Title: AI Linguistic Model & software test
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Bo Zhang (Completed) , Lester B. Pearson Center
Thesis/Project Title: IT Market Modeling
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Hua Hin Ho (Completed) , Lester B. Pearson Center
Thesis/Project Title: Website Development
Present Position: Recently graduated
- 2018/4 - 2018/6
Principal Supervisor Miyuki Matsuzaki (Completed) , Lester B. Pearson Center
Thesis/Project Title: AI Linguistic Model & Software Test
Present Position: Recently graduated

Research Associate [n=4]

- 2023/9 - 2023/12 Nicholas Derby, McGill University
Principal Supervisor Thesis/Project Title: Measuring human cognitive workload to overcome workplace procrastination
Present Position: Research Associate, Concordia University
- 2018/5 - 2019/4 Lucas House (Completed) , Concordia University
Principal Supervisor Thesis/Project Title: Cognitive Science
Present Position: Ph.D. Student, UQAM / Partime RA, Concordia University
- 2018/1 - 2019/4 Yi Dou (Completed) , Concordia University
Principal Supervisor Thesis/Project Title: EEG Signal Processing
Present Position: RA, Concordia University
- 2018/1 - 2018/12 Lixin Liu, Concordia University
Principal Supervisor Thesis/Project Title: Improvement of Valtech Workflow: A Pilot Study
Present Position: RA, Concordia University

Event Administration

- 2023/1 - 2024/8 Organization Chair, Eleventh International Conference on Design Computing and Cognition, Conference, 2024/7 - 2024/7
- 2022/8 - 2023/3 Chair of Steering Committee, International Workshop of the Society of Design and Process Science - SDPS 2023, Workshop, 2023/2 - 2023/2
- 2017/11 - 2018/8 Conference Chair, Design Science Research (DSR) 2018: Workshop on Data Driven Design and Learning, August 23 – 25, 2018, Montréal, Canada, Workshop, 2018/8 - 2018/8

Editorial Activities

- 2022/9 - 2027/8 Associate Editor, Journal of Engineering Design, Journal
- 2020/9 - 2023/8 Associate Editor, Artificial Intelligence in Engineering Design, Analysis and Manufacturing, Journal
- 2014/1 - 2018/11 Editorial Board Member, Journal of Computational Design and Engineering, Journal
- 2012/1 - 2018/11 Editor-in-Chief, Transactions of SDPS: Journal of Integrated Design and Process Science, Journal
- 2011/10 - 2018/11 Editorial Board Member, Computers in Industry, Journal

International Collaboration Activities

- 2017/9 - 2018/12 Executive Director, Concordia-CCNU Joint Center, Montréal, Canada and Wuhan, China
Established the Concordia-CCNU Joint Research Centre for Teaching & Learning Design. Jointly organized Design Science Research 2018. Co-supervising a PhD student on education design based on EBD proposed by the applicant. Helping the faculty members at CCNU apply the theory developed by the applicant.

Presentations

1. (2018). Keynote Speaker - Language, Cognition and Design: a Neuro-cognitive Approach. International Symposium on Cognitive Neural Mechanism of Language, RIZHAO, China, Dec. 14-16, 2018, China
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
2. (2018). Keynote Speaker - How Can an Emotional Brain be Rationally Creative?. TMCE 2018, May 7-11, 2018, Las Palmas de Gran Canaria, Spain
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
3. (2018). Plenary Speaker - Metrics that Matter: the Support of EEG in Understanding Designers. DCC 2018: Eighth International Conference on Design Computing and Cognition, July 2-4, 2018, Politecnico di Milano, Lecco Campus, Italy
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
4. (2017). Keynote Speaker - ROM: Modeling Linguistic Information in Engineering Design. the First International Salon in Cognitive Linguistics, June 26, 2017, CCNU, Wuhan, China
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes
5. (2017). Keynote Speaker - A Science of Design for Studying Design Activities: Object of Study, Axioms, and Research Methodologies. ICMD/ADCP2017: Advanced Design Concepts and Practice Workshop, November 19-21, 2017, Beijing, China
Main Audience: Researcher
Invited?: Yes, Keynote?: Yes

Publications

Journal Articles

1. Mengting Zhao, Dongyu Qiu, Yong Zeng. (2023). How much workload is a “good” workload for human beings to meet the deadline: human capacity zone and workload equilibrium. *Journal of Engineering Design*. 34(8): 644-673.
Published
Refereed?: Yes, Open Access?: No
2. Cheligeer, C., Yang, J., Bayatpour, A., Miklin, A., Dufresne, S., Lin, L., Bhuiyan, N. and Zeng, Y. (2023). A Hybrid Semantic Networks Construction Framework for Engineering Design. *Journal of Mechanical Design*. 145(4): p.041405.
Published
Refereed?: Yes, Open Access?: No
3. Pan, J., Huang, J., Cheng, G., & Zeng, Y. (2023). Reinforcement learning for automatic quadrilateral mesh generation: A soft actor–critic approach. *Neural Networks*. 157: 288-304.
Published
Refereed?: Yes, Open Access?: No
4. Yang L, Kuang A, Xu C, Shewchuk B, Singh S, Quan H, Zeng Y. (2023). Design Principles in mHealth Interventions for Sustainable Health Behavior Changes: Protocol for a Systematic Review. *JMIR Research Protocols*. 12: e39093.
Published
Refereed?: Yes, Open Access?: Yes

5. Wen Z, Teng MF, Han L, Zeng Y. (2022). Working Memory Models and Measures in Language and Bilingualism Research: Integrating Cognitive and Affective Perspectives. *Brain Sciences*. 12(6): 729-745.
Published
Refereed?: Yes, Open Access?: Yes
6. Guosong Wu, Cathy Eastwood, Yong Zeng, Hude Quan, Quan Long, Zilong Zhang, William A. Ghali, Jeffrey Bakal, Bastien Boussat, Ward Flemons, Alan Forster, Danielle A. Southern, Søren Knudsen, Brittany Popowich, Yuan Xu. (2022). Developing EMR-based algorithms to Identify hospital adverse events for health system performance evaluation and improvement: Study protocol. *Plos one*. 17(10): e0275250.
Published
Refereed?: Yes, Open Access?: Yes
7. Yuri Borgianni, Brian Dixon, Stephen Ekwaro-Osire, Oscar Nespoli, Joshua Summers, Thomas Wan, Yong Zeng. (2022). Domain-Independent Design Theory and Methodology to Boost the Adoption of Design Methods. *Journal of Integrated Design and Process Science*. 26(3-4): 1-12.
In Press
Refereed?: Yes, Open Access?: No
8. Y Shi, H Yang, Y Dou*, Y Zeng. (2022). Effects of mind mapping-based instruction on student cognitive learning outcomes: a meta-analysis. *Asia Pacific Education Review*. in-press: 1-15.
Published
Refereed?: Yes, Open Access?: Yes
9. Thomas T.H. Wan, Sarah Matthews, Hsing Luh, Yong Zeng, Zhibo Wang, Lin Yang. (2022). A proposed multi-criteria optimization approach to enhance clinical outcomes evaluation for diabetes care: a commentary. *Health Services Research and Managerial Epidemiology*. 9: 1-9.
Published
Refereed?: Yes, Open Access?: Yes
10. Ali Mohammadi*, Jiami Yang*, Yuri Borgianni, Yong Zeng. (2022). Barriers and enablers of TRIZ: a literature analysis using the TASKS framework. *Journal of Engineering, Design and Technology*. in-press: 1-26.
In Press
Refereed?: Yes, Open Access?: No
11. Razavi, Seyed Reza, Akgunduz, Ali, and Zeng, Yong. (2022). Impact of course timetabling on learning quality: sustaining an optimized stress level to stimulate enhanced comprehension. *Journal of Integrated Design and Process Science*. 26(1): 25-44.
Published
Refereed?: Yes, Open Access?: No
12. Jiami Yang, Hude Quan, Yong Zeng. (2022). Knowledge: the good, the bad, and the ways for designer creativity. *Journal of Engineering Design*. 33(12): 945-968.
Published
Refereed?: Yes, Open Access?: Yes
13. Cheligeer Cheligeer, Jingwei Huang, Guosong Wu, Nadia Bhuiyan, Yuan Xu and Yong Zeng. (2022). Machine learning in requirements elicitation: a literature review. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing*. 36(e32): 1-23.
Published
Refereed?: Yes, Open Access?: Yes
14. Yang, J.*, Yang, L., Quan, H., Zeng, Y. (2021). Implementation Barriers: A TASKS Framework. *Journal of Integrated Design and Process Science*. 25(3-4): 134-147.
In Press
Refereed?: Yes, Open Access?: Yes

15. Wenjun Jia*, Frederic von Wegner, Mengting Zhao* & Yong Zeng. (2021). Network oscillations imply the highest cognitive workload and lowest cognitive control during idea generation in open-ended creation tasks. *Scientific Reports*. 11(24277): 1-23.
Published
Refereed?: Yes, Open Access?: Yes
16. Tanik, Murat M., Stan Gatchel, Imre Horváth, Thomas Wan, Kyoung-Yun Kim, Jingwei Huang, Eric Coatanea, Bernd Krämer, and Yong Zeng. (2021). Footsteps Towards a Transdisciplinary Design and Process Science. *Journal of Integrated Design and Process Science*. 25(3-4): 1-16.
Published
Refereed?: No, Open Access?: No
17. J Huang, P Beling, L Freeman, Y Zeng, KJ Kim. (2021). Trustworthy AI for Digital Engineering Transformation. *Journal of Integrated Design and Process Science*. 25(1): 1-7.
Published
Refereed?: Yes, Open Access?: Yes
18. Jie Pan*, Jingwei Huang, Yunli Wang, Gengdong Cheng, Yong Zeng. (2021). A self-learning finite element extraction system based on reinforcement learning. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing*. 35(2): 180-208.
Published
Refereed?: Yes
19. Wenjun Jia*, Yong Zeng. (2021). EEG signals respond differently to idea generation, idea evolution and evaluation in a loosely controlled creativity experiment. *Scientific Reports*. 2021: 2119.
Published
Refereed?: Yes, Open Access?: Yes
20. Horváth, I., Zeng, Y., Liu, Y., & Summers, J. (2021). Smart designing of smart systems. *Artificial Intelligence for Engineering Design, Analysis and Manufacturing*. 35(2): 129-131.
Published
Refereed?: Yes
21. Jiami Yang*, Yong Zeng, Stephen Ekworo-Osire, Abraham Nispel, Hua Ge. (2021). Environment-Based Life Cycle Decomposition (eLCD): Adaptation of EBD to Sustainable Design. *Journal of Integrated Design and Process Science*. 2021: 1-24.
In Press
Refereed?: Yes
22. Mengting Zhao*, Wenjun Jia*, Daocheng Yang*, Philon Nguyen*, Thanh An Nguyen* and Yong Zeng. (2020). A tEEG Framework for Studying Designer's Cognitive and Affective States. *Design Science*. 6: e29.
Published
Refereed?: Yes, Open Access?: Yes
23. Seyed Reza Razavi*, Ali Akgunduz, Yong Zeng. (2020). Impact of Course Timetabling on Learning Quality: Sustaining an Optimized Stress Level to Stimulate Enhanced Comprehension. *Research in Higher Education*. 2020: 1-25.
Submitted
Refereed?: Yes
24. Y. Zeng. (2020). Environment: the first thing to look at in conceptual design. *Journal of Integrated Design and Process Science*. 24(2): 5-28.
Published
Refereed?: Yes
25. P. Nguyen*, T. A. Nguyen* and Y. Zeng. (2019). Segmentation of Design Protocol Using EEG. *Artificial Intelligence in Engineering Design, Analysis, and Manufacturing (AI EDAM)*. 33(1): 11-23.
Published
Refereed?: Yes

26. P. Nguyen*, T. A. Nguyen* and Y. Zeng. (2018). Empirical Approaches to Quantifying Effort, Fatigue and Concentration in the Conceptual Design Process. *Research in Engineering Design*. 29(3): 393-409.
Published
Refereed?: Yes
27. M. Shu*, S. Tan*, L. Fu*, Y. J. Zeng*, X. Cao* and Y. Zeng. (2017). Application of Design Methodologies to Web System Design: A Case Study of JIDPS Editorial System. *Transactions of the SDPS: Journal of Integrated Design and Process Science*. 21(4): 79-112.
Published
Refereed?: Yes
28. X. Wang*, Y. Zeng, A. Arntzen, K. Y. Kim and Y. Liu. (2017). Organizational Capability: Skills Related to Organizational Knowledge. *Transactions of the SDPS: Journal of Integrated Design and Process Science*. 21(1): 1-3.
Published
Refereed?: No
29. X. Wang* and Y. Zeng. (2017). Organizational Capability Model: Toward Improving Organizational Performance. *Transactions of the SDPS: Journal of Integrated Design and Process Science*. 21(1): 5-24.
Published
Refereed?: Yes
30. T. A. Nguyen* and Y. Zeng. (2017). A Theoretical Model of Design Fixation. *International Journal of Design Creativity and Innovation*. 5(3-4): 185-204.
Published
Refereed?: Yes
31. F. Zhao*, M. Xie*, Z. Tian and Y. Zeng. (2017). Integrated Equipment Health Prognosis Considering Crack Initiation Time Uncertainty and Random Shock. *Chinese Journal of Mechanical Engineering*. 30(6): 1383.
Published
Refereed?: Yes

Book Chapters

1. M. Zhao*, D. Yang*, S. Liu* and Y. Zeng. (2018). Mental Stress-Performance Model in Emotional Engineering. Shuichi Fukuda. *Emotional Engineering*. (6): 119-139.
Published, Springer
Refereed?: No
2. F. Zhao*, Z. Tian and Y. Zeng,. (2017). Overview on Gear Health Prognostics. *Probabilistic Prognostics and Health Management of Energy Systems*. : 49–65.
Published, Springer
Refereed?: No

Conference Publications

1. Jiami Yang, Yi Dou, Yong Zeng. (2023). Environment-based design (EBD): using only necessary knowledge for designer creativity. *Proceedings of the International Conference on Engineering Design (ICED23)*. International Conference on Engineering Design (ICED23), Bordeaux, France (DOI:10.1017/pds.2023)
Conference Date: 2023/7
Paper
Published
Refereed?: Yes, Invited?: No

2. Hamed Shirazi*, Jiami Yang*, Hude Quan, Yong Zeng. (2022). Analyzing Human-Centered Design Methodology with TASKS Framework. Tenth International Conference on Design Computing and Cognition, United Kingdom
Poster
Published
Refereed?: Yes, Invited?: No
3. Siyuan Sun*, Pavan Tejaswi Velivela, Yong Zeng, Yaoyao Fiona Zhao. (2022). Knowledge extraction method to support domain integrated design methodology. Proceedings of the ASME 2022 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference, United States of America
Conference Date: 2022/8
Paper
Published
Refereed?: Yes, Invited?: No
4. Tianyu Chen, Jiami Yang, Wenheng Du, Jinli Yao, Jun Yan, Hua Ge, Nadia Bhuiyan, Fayi Zhou, Xiao Liu, Yong Zeng. (2022). Data Quality Criteria for Urban Waste Management Policy-Making Using Environment-Based Design. 10th IFAC Conference on Manufacturing Modelling, Management and Control, France
Conference Date: 2022/6
Paper
Published
Refereed?: Yes, Invited?: No
5. C Su*, A. Akgunduz, Y Zeng. (2022). Design education: learning design methodology to enrich project experience. Canadian Engineering Education Association Annual Conference'2022: Transforming Learners to Transform Our World, Canada
Conference Date: 2022/6
Paper
Published
Refereed?: Yes, Invited?: No
6. Jiami Yang*, Lin Yang, Nadia Khan, Shaminder Singh, Hude Quan, Yong Zeng. (2021). Identifying Hypertension Self-Management Barriers from Qualitative Data. The 7th international CBC conference 2021, United Kingdom
Poster
Published
Refereed?: Yes, Invited?: No
7. W. Du, J. Yang, H. Ge, J. Yang, N. Bhuiyan, X. Liu, F. Zhou, Y. Zeng. (2021). Environment-based design (EBD) approach to identify critical issues in managing municipal solid waste: nairobi, kenyan case study. The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences, France
Paper
Published
Refereed?: Yes, Invited?: No
8. A. Omimi* and Y. Zeng. (2018). Defining the Appropriate Course Project for Fostering the Expected Cognitive Competencies: EBD Approach to an Engineering Design Course. 2018 Canadian Engineering Education Association Conference,
Paper
Published
Refereed?: Yes, Invited?: No

9. A. Omimi*, Y. Zeng and C. Marsden. (2017). Design Problem Perception in Engineering Design Teams. 2017 Canadian Engineering Education Association Conference,
Paper
Published
Refereed?: Yes, Invited?: No
10. A. Cartile*, C. Marsden and Y. Zeng. (2017). Aircraft design: a Case Study on An alternative Engineering Undergraduate Capstone Final Year Project. 2017 Canadian Engineering Education Association Conference,
Paper
Published
Refereed?: Yes, Invited?: No
11. S. Taheri*, R. Gutierrez*, Y. Zeng and C. Marsden. (2017). Measuring the Effectiveness of Student Learning in an Aerospace Engineering Capstone Project. 2017 Canadian Engineering Education Association Conference,
Paper
Published
Refereed?: Yes, Invited?: No
12. R. Gutierrez*, L. Liu*, D. Singh*, C. Marsden and Y. Zeng. (2017). Which Design Methodologies Are Effective to Support a Capstone Project in Aerospace Design Engineering?. 2017 Canadian Engineering Education Association Conference,
Paper
Published
Refereed?: Yes, Invited?: No
13. P. Nguyen*, T. A. Nguyen* and Y. Zeng. (2017). Modal Shifts in Concentration Indicate Creativity. International Conference on Engineering Design (ICED),
Paper
Published
Refereed?: Yes, Invited?: No

Appendix 9: List of External Experts Who Supported the Proposal by Providing Detailed Feedback in the Survey

We did not ask for support letters from the industry. We took a more data-driven approach by asking industry experts to complete a comprehensive survey for us. We reached out to 39 industry experts through CIIS faculty networks. These professionals represent a broad range of sectors such as technology consulting, telecommunications, finance, utilities, and healthcare, and hold varied roles from executive to technical specialists. Their collective input directly informs the industry-focused orientation of our curriculum. The following is the list of industry experts who supported the proposal by providing detailed feedback in the survey. Detailed survey results can be found in Appendix 5.

Name	Current job title	Organization	Core responsibilities
Subhashish Chakravarty	Sr Eng Manager	Collins Aerospace	Engineering management and research
Alireza Arasteh	Head of Canada	Mandiant Consulting	Management
Bassam	Researcher	HQ	research and project management
Aurelian Constantinescu	Project Manager, Collaboration and Government Programs, and Academic Partnerships	CAE Inc.	Project management
Mohammad Faghani	Director of Managed Detection and Response	Accenture	Provide Managed Detection and Response services to clients
Steven Wang	Sr Director	Mistplay	Leadership of engineering teams
Boubakr	Researcher	Ericsson	R7D
CASAMIA	CEO	CREANCES ET SOLUTIONS	
Remi Benito	Aircraft Cybersecurity	Bombardier	Engineering
Makan Pourzandi	Research Leader	Ericsson	Research
Warren Lee	Cybersecurity Leadership - GRC	Pratt and Whitney	Governance Risk and Compliance
Yosr Jarraya	Master Researcher	Ericsson	Research
Ribal Atallah	Cybersecurity Researcher	Hydro-Québec	project manager, cybersecurity research, AI research
Marthe Kassouf	Researcher	Hydro-Quebec	Project management and research
Bin Li	Senior Software Engineer	YMAX Communications Corp	Engineering
chen kuang	tech lead	Bell Flight	engineering

Name	Current job title	Organization	Core responsibilities
Heyang Zhao	Cybersecurity Specialist	Alstom	engineering
Plamen Hristov	Sr. Manager Internal Audit	CN Rail	management
Jerry Xiao	Manager	RdQCC LLC	Management
Julian Conte	Product Manager	Creo Solutions	Management, coordination, defining vision
Eric Chung	Manager	CAE Inc	Engineering Management
Andrée Robichaud-Véronneau	Senior Data Scientist	Ciena Corporation	Engineering
Olivier Henley	Embedded Engineer	Adacore	Emerging Markets
Layial El-Hadi	Executive Director	Fintech Cadence	Management
George Mastromonaco	V.P. Sales & Marketing	Ingenia Technologies Inc.	Sales Force Management and Product Manager
Will Edwards	Head of Cyber Services	SEL	Cyber Engineering
Fayi Zhou	Manager	EPCOR	Engineering plus Management
Hyame Alameddine	Senior Security Researcher	Ericsson	Security research
Marc-André Guérette	Director of Information Security	Rheinmetall Canada	Management
Aram Montazami	VP of R&D	Novatek International	Management of all R&D projects and teams
Wissem Maazoun	Vice-President of Innovation	BusPas Inc.	Engineering, Research
Umang Handa	Partner, National Leader, Cybersecurity as a Service	PwC	Lead Cyber as a Service for PwC Canada, Nationally
Hui Zhu	Research Scientist	Thales Group	Research and development
Mohamad El Hout	Founder	Houtech Consulting	Security consulting and headhunting
Marc Potvin	Project Engineer	Bba Inc.	Engineering
Luis Suárez	Researcher	Ericsson Research	Research 5G, 6G trust management
Patrick Jean-Baptiste	President	Sunphinx	Management
Roberto Pimentel	Director, Software Engineering	Raymond Chabot Grant Thornton	Engineering management + Sofotware Research and Development
Danial Jafarigiv	Cybersecurity Researcher	Hydro-Quebec Research Institute (IREQ)	Research

Amber Saunders

From: Chun Wang
Sent: Tuesday, April 23, 2024 12:16 AM
To: Amber Saunders
Subject: Fw: BSc in Cybersecurity - need for consultation from Dept of Mathematics and Statistics
Attachments: MATH366_4_24.pdf; BSc_Cybersecurity_program proposal_2024-03-28.pdf

Hello Amber,
Department of Mathematics and Statistics have no objections to the inclusion of the mathematics electives courses in the BSc in Cybersecurity.
Please see the following email from Dr. Bertola.

They also suggested to add MATH 366 to Table 7.3. If it is not too late to do that, I am OK with their suggestion. Otherwise, we can always add it at a later date if necessary.
Many thanks,
Chun

From: Marco Bertola <marco.bertola@concordia.ca>
Sent: Monday, April 22, 2024 12:39
To: Chun Wang <chun.wang@concordia.ca>
Cc: Associate Chair Math & Stats <associatechair.mathstat@concordia.ca>
Subject: Re: BSc in Cybersecurity - need for consultation from Dept of Mathematics and Statistics

Hello Chun,

we have no problems with this.

Rather, our Associate Chair points out a potential bottleneck; some of the suggested electives at the 3xx level have pre-requisites which will be hard to satisfy. E.g. 392 and 339 require 18 credits post-CEGEP in math, a requirement that most CGS will not meet and would require a waiver.
May I also suggest (in addition or in replacement) MATH 366 (Complex analysis, outline attached), which requires only MATH 264/265 (which is the same as MAST 218/219)?

In any case we have no issues.
Best
Marco

On Apr 22, 2024, at 9:51 AM, Chun Wang <chun.wang@concordia.ca> wrote:

Hello Dr. Bertola,

The Concordia Institute for Information Systems Engineering (CIISE) in the Gina Cody School of Engineering and Computer Science is proposing two new programs, the B.Sc. in Cybersecurity and the B.Eng. in Cybersecurity Engineering. The program proposals have been submitted for consideration at the Senate meeting of May 17.

The B.Sc. in Cybersecurity program requirements will include 9 credits chosen from mathematics courses, including several courses offered by the Department of Mathematics and Statistics. (This is similar to the current BCompSc in Computer Science, which includes 6 credits taken from Mathematics Electives; see [Section 71.70.2 BCompSc Degree Requirements](#) in the Undergraduate Calendar.)

I have attached the BCompSc program proposal. The Mathematics Electives component can be found on page 37, Table 7.3 (Mathematics Electives: BSc Cybersecurity).

Could you please let me know as soon as possible if you have any objections to the inclusion of these mathematics courses?

Regards,

Chun Wang

Chun Wang, Professor and Director

Concordia Institute for Information Systems Engineering (CIISE),
1515 Sainte-Catherine West, S-EV 007.642

Montreal, Quebec, Canada, H3G 2W1

Tel.: [\(514\) 848-2424 ext. 5715](tel:(514)848-2424) | Fax.: [\(514\) 848-3171](tel:(514)848-3171)

Email: chun.wang@concordia.ca

Web: <http://users.encs.concordia.ca/~cwang/>



**SENATE
OPEN SESSION
Meeting of May 17, 2024**

AGENDA ITEM: Academic Programs Committee recommendation: New program: Graduate Diploma in Teacher Certification (AS-EDUC-5510)

ACTION REQUIRED: For approval

SUMMARY: Senate is being asked to approve a new program - Graduate Diploma in Teacher Certification (AS-EDUC-5510)

BACKGROUND:

The Department of Education, Faculty of Arts and Science, is proposing to create a new 30-credit graduate program: Graduate Diploma in Teacher Certification (the "GDTC Program"). This curriculum proposal was approved by the Department of Education Curriculum Committee on January 17, 2024, and by the Department of Education meeting on January 24, 2024.

The Department of Education proposes to launch a graduate-level GDTC Program, consisting of 30 credits. The proposed GDTC Program is a strategic response to the pressing needs within Québec's educational landscape: critical teacher shortage and teacher attrition in Québec, professional development for uncertified practicing teachers for specific challenges teachers encounter in classrooms, flexible schedule for work-life balance and more affordable education leading to the teaching license in Québec.

The proposed start date of the program is the Winter term of the 2024-25 academic year. The program comprises two clusters: the Preschool and Elementary Teaching Cluster targets individuals teaching or aspiring to teach in Kindergarten through Grade 6, and the Second Language Teaching Cluster caters to those teaching or interested in teaching second languages at elementary and secondary levels. This initiative aligns with the Ministry of Education's recommendation for an accelerated yet comprehensive path to teacher certification.

The program was approved by the Academic Programs Committee on April 25, 2024.

DRAFT MOTION:

That, on recommendation of the Academic Programs Committee, Senate approve the new program Graduate Diploma in Teacher Certification (AS-EDUC-5510), as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate
Date: May 7, 2024

**ACADEMIC PROGRAMS COMMITTEE
REPORT TO SENATE
Sandra Gabriele, PhD
April 25, 2024**

The Academic Programs Committee requests that Senate consider the following changes for the Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposal be forwarded to Senate for approval:

Undergraduate Curriculum Proposals (Changes for the 2025-26 Calendar)

Gina Cody School of Engineering and Computer Science

Concordia Institute for Information Systems Engineering
GCS-CIISE-5564; **APC-2024-2-D1**

- New Program: BEng in Cybersecurity Engineering

GCS-CIISE-5566; **APC-2024-2-D2**

- New Program: BSc in Cybersecurity

Graduate Curriculum Proposals (Changes for the 2024-25 Calendar)

Faculty of Arts and Science

Department of Education
AS-EDUC-5510; **APC-2024-3-D1**

- New Program: Graduate Diploma in Teacher Certification (For January 2025 Implementation)

Faculty of Fine Arts

Department of Art History
FA-ARTH-5506; **APC-2024-3-D2** (For September 2025 Implementation)

- New Program: Graduate Certificate in Curatorial Studies and Practices

FA-ARTH-5507; **APC-2024-3-D3** (For September 2025 Implementation)

- New Program: Microprogram in Curatorial Studies



Sandra Gabriele, PhD
Vice-Provost, Innovation in Teaching and Learning
April 25, 2024

Summary and Rationale for Changes

The **Department of Education** is proposing to create a new 30-credit graduate program: Graduate Diploma in Teacher Certification.

This curriculum proposal was approved by the Department of Education Curriculum Committee on January 17, 2024, and by the Department of Education meeting on January 24, 2024. The CTEC vote took place on February 23, 2024, and was approved.

Excerpt from the Executive Summary:

(Please see the Executive Summary in the proposal for the list of the program's common core and cluster courses and the course sequence and pre- and co-requisites.)

Program Overview

The Department of Education proposes to launch a graduate-level Graduate Diploma in Teacher Certification (GDTC), consisting of 30 credits. The proposed Graduate Diploma in Teacher Certification is a strategic response to the pressing needs within Quebec's educational landscape: critical teacher shortage and teacher attrition in Quebec, professional development for uncertified practicing teachers for specific challenges teachers encounter in classrooms, flexible schedule for work-life balance and more affordable education leading to the teaching license in Quebec. The proposed start date of the program is the Winter term of the 2024-25 academic year.

The program comprises two clusters: the Preschool and Elementary Teaching Cluster targets individuals teaching or aspiring to teach in Kindergarten through Grade 6, and the Second Language Teaching Cluster caters to those teaching or interested in teaching second languages at elementary and secondary levels. This initiative aligns with the Ministry of Education's recommendation for an accelerated yet comprehensive path to teacher certification.

Program Design

The program adopts a Competency-based Education Model aligned with the Quebec Reference Framework for Professional Competencies for Teachers (2021). Recognizing the wealth of experience uncertified teachers hold, this model respects and builds upon their existing skills. All participants will possess a bachelor's degree, fulfill a minimum teaching hour requirement, and hold a valid Letter of Tolerance or active teaching contract.

The program deliberately integrates a Work-Integrated Learning Design feature. This approach encourages reflection on theoretical concepts and enhances the practical applicability of the program. It fosters a dynamic learning experience where action research is applied to real classroom challenges and provides opportunities for growth and development. By permitting uncertified teachers to continue teaching while undergoing valuable training, the program recognizes the value of candidates' work environments and contributes to the ongoing professionalization of their practice. This approach positions the program as relevant and responsive to uncertified educators' authentic needs and experiences.

Acknowledging that many uncertified teachers are currently employed, the program will primarily be offered online, featuring flexible scheduling options, online coursework, remote mentoring and supervision, and in-person weekend workshops. This flexibility accommodates the varied responsibilities of working individuals, ensuring a balance between work, education, and family commitments.

The program stands out by offering personalized learning pathways. Course professors collaborate with

program participants to tailor individualized learning plans based on specific needs, classroom challenges, and real-time data. This approach ensures a targeted and impactful learning experience, enhancing the program's relevance and effectiveness.

Needs Assessment

A thorough needs assessment was conducted through surveys and engagement with teachers holding Letters of Tolerance in Quebec; in addition, the findings of a comprehensive environmental scan of comparable programs in Quebec and North America and insights from consultations with administrators directly involved in teacher recruitment and retention were also considered. The program design responds to uncertified teachers' expressed needs, leveraging expert insights on teacher training and aligning with the Minister of Education's directives.

Collaboration with School Boards and Service Centres

The program is committed to collaborating closely with school boards and service centres in Quebec to identify individuals with the right teaching qualities and aptitudes. This partnership ensures that the program attracts candidates well-suited for the teaching profession, focusing on those who have the necessary previous experience teaching in the system. By actively involving educational stakeholders, we aim to align the program with the specific needs and expectations of Quebec schools.

Conclusion

The proposed Graduate Diploma in Teacher Certification aims to meet this imperative, contributing to preparing well-equipped and certified teachers to address the pressing shortage in Quebec schools. Ensuring qualified professionals lead classrooms is paramount to providing preschool, elementary and secondary students with a high-quality education. The program is strategically designed to be relevant, competitive, and responsive to the current educational landscape in Quebec. It addresses the unique challenges uncertified teachers face and aligns with the Minister of Education's directives on accessible pathways to teaching.

Note on Pass/Fail

As the Graduate Diploma in Teacher Certification is a competency-based program, all courses will be evaluated on a pass/fail basis. The reasoning behind the pass/fail evaluation is as follows:

- As participants in the program will already be working in Quebec's schools, the purpose of evaluating them is to determine whether they have developed each of the professional competencies associated with each course to a degree that is acceptable for a teacher, rather than the level of the competency development.
- Given that the majority of the work will be done in the classrooms themselves, it will be difficult for course instructors to assign a letter grade to students' work. Rather, through the student's documentation that demonstrates evidence of their learning, the course instructor will be able to assess whether the competency has been developed. The same system is used currently for our internship courses in the TESL and ECEE programs, and allows students, internship supervisors, and cooperating teachers to focus on learning, feedback, and growth.
- At the end of the program, students will be recommended for the teaching brevet in the province of Quebec. The brevet is the same for every person, regardless of their grades in their teacher education program (provided they meet the minimum grade requirements). Therefore, the outcome for students will be the same, and students can focus more on developing the professional teaching competencies identified by the Ministry of Education.
- The idea of this program is to ensure graduates are competent and effective teachers. When grades are given in a course, there is a normal curve expected. In this case though, we want all of our students to demonstrate high levels of competence, so giving grades and assuming normal curves would not be appropriate.

Resource Implications

Please see section 9. Resources and 10. Budget Estimate in the proposal for detailed resource implications.

The estimated budget for the proposed program is delineated in the summary budget table.

The program will offer the following number of course sections in each year which needs to be added to the Department's base section count:

1. Year 1 = 3.5 section for the first program cohort *
2. Year 2 = 12.5 sections (7.5 sections for the first program cohort plus 5 sections for the second cohort)
3. Year 3 = 13 sections (3 sections for the first program cohort, 5 sections for the second cohort, 5 sections for the third program cohort)
4. Year 4 = 10 sections (5 sections for the third program cohort, 5 section for the fourth cohort)
5. Year 5 = 10 sections (5 sections for the fourth program cohort, 5 sections for the fifth program cohort)

* The typical number of sections offered each year is 10. Because the first cohort will exceptionally start in the Winter, while all other cohorts will begin in the Fall, Year 1 sections are reduced, and Years 2 and 3 sections are higher. As of Year 4, the number of sections offered each year will be 10. (For course sequence refer to Appendix 13.)

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 17 May 2024

Approved by:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 16 Apr 2024

Following approval of the Faculty Councils, APC members reviewed the curriculum submission

AS-EDUC-5510; APC-2024-3-D1.

As a result of discussions, APC resolved that the following curriculum proposal be forwarded to Senate for approval.

Summary of Committee Discussion: CSGS approval

For Submission to:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 16 Apr 2024

Approved by:

Faye Diamantoudi, Dean of Graduate Studies,
Council of the School of Graduate Studies, 22 Mar 2024

The CSGS approved the enclosed curriculum changes in their final form (GCC 2324 4 D3). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal.

Summary of Committee Discussion: GCC approval

For Submission to:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 16 Apr 2024

Approved by:

Rachel Berger, Associate Dean, Academic Programs and Development,
Graduate Curriculum Committee, 04 Mar 2024

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2324 7 D2). I therefore recommend that the Academic Programs Committee approve and recommend to Senate the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Rachel Berger, Associate Dean, Academic Programs and Development,
Graduate Curriculum Committee, 04 Mar 2024

Approved by:

Pascale Sicotte, Dean, Faculty of Arts and Science,
Arts and Science Faculty Council, 08 Mar 2024

The following proposal was submitted forward for approval at the Arts and Science Faculty Council meeting of March 8, 2024 (ASFC-2024-3M). We request that this dossier be reviewed at the next Graduate Curriculum Committee meeting. The Dean acknowledges the resource implications requested in this proposal, as these have been discussed with the unit. They will be presented at the Arts and Science Faculty Council.

Summary of Committee Discussion: Faculty Curriculum Approval (FCC/FAPC)

For Submission to:

Pascale Sicotte, Dean, Faculty of Arts and Science,
Arts and Science Faculty Council, 08 Mar 2024

Approved by:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 16 Feb 2024

The **Department of Education** is presenting a new graduate program to deal with the societal need for more competent, devoted elementary and secondary school teachers in Québec. This program, the 30-credit Graduate Diploma in Teacher Certification (GDTC), is the result of multiple discussions at many levels of the institution, from the Department, the Faculty, and the Office of the Provost, but also from the discussions with the Concordia Teacher Education Council, the School of Graduate Studies, and outside the institution, with the *ministère de l'Éducation du Québec* and the *ministère de l'Enseignement Supérieur du Québec*.

The challenges in building such a program are significant. If anything, it is counter intuitive that a program that would respond to societal demand could be both short and thorough, and as well as being theoretically and practically sound, while being adapted to the incoming learner into the diploma. The challenge sent by the *ministère de l'Éducation du Québec* also set a very short timeline for the development. To achieve the tough task, the unit has developed a program that integrates several innovations in its design:

- It is reserved for applicants who already have a baccalaureate degree.
- It is competency-based. This permits to focus on the attainment of a specific set of competencies that, combined with the individual's previous university education, make them ready for the professional teaching duties, as well as providing the related theoretical bases.
- The program's structure ensures that students will receive a program that is adapted to their particular profile.
- The applicants must also have experience and a letter of tolerance (or a contract) from a School Board or a Service Centre.
- Students can do this program part-time, with learning activities adapted to their schedule, while continuing their work in the Education system.

The result is a 30-credit program, lasting two years while the candidate still can teach, contribute, and develop their portfolio, providing graduates with access to the Brevet from the *ministère de l'Éducation du Québec*, as well as providing them with high-level notions and practices that can serve to eventually build other elements in their career.

I would like to use a bit of space here to thank Teresa Hernandez-Gonzalez and Nathalie Rothschild, faculty members in Education, very well supported by Dalia Radwan, curriculum developer for the Vice-Provost Innovation in Teaching and Learning, for the breadth and depth of this work achieved in a relatively short amount of time. A strong thank you to the Department of Education and its Chair and other officers for ultimately supporting their colleagues' quest. A quick mention here as well to underline the sizable efficient communications across the various offices in the university, who sustained a collaborative dialogue throughout the development of this new program.

Resources: This program requires significant resources, which have been discussed (and approved in principle) with the Dean and Provost Office. Based on enrolments, adjustments will be made along the way if/when needed.

Summary of Committee Discussion: Department Approval

For Submission to:

Richard Courtemanche, Associate Dean, Academic Programs,
Faculty Curriculum Committee, 11 Mar 2024

Approved by:

Saul Carliner, Chair, Department of Education,
Department of Education Meeting, 24 Jan 2024

The proposal was also circulated for CTEC approval.

Graduate Diploma in Teacher Certification

Admission Requirements

- Bachelor's Degree. Applicants must have completed a high-standing bachelor's/baccalaureate (or equivalent). High standing is defined as honours, specialization, or a GPA equivalent to a B average.
- Teaching Experience. Applicants must have a minimum of five years of teaching contracts (full- or part-time). Applicants will be prioritized according to both their total number of hours accumulated and length of the contracts.
- Recommendation letter from a school principal or a service centre/school board.
- Letter of Tolerance. The Letter of Tolerance is issued from a School Board or Centre des Services Scolaires in Quebec or a teaching contract valid during the duration of the program.
- **Proficiency in English.** Applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the [English language proficiency](#) page for further information on requirements and exemptions.

Degree Requirements

Graduate Diploma in Teacher Certification (30 credits)

18.0 required credits:

- GDTC 500 Introduction to the Program: The Teacher's Bootcamp (1.50)
- GDTC 501 The Teacher's Workshop I (1.50)
- GDTC 502 The Teacher's Workshop II (1.50)
- GDTC 503 Planning and Implementing Learning Situations (3.00)
- GDTC 504 Evaluation of and for Learning (3.00)
- GDTC 505 Fostering Diversity in the Classroom (3.00)
- GDTC 506 Inclusive Pedagogy (3.00)
- GDTC 507 Portfolio Creation (1.50)

EDUC 200 English Exam for Teacher Certification (0.00)

12.0 credits chosen from one of the following:

Preschool and Elementary Teaching Cluster
Second Language Teaching Cluster

Preschool and Elementary Teaching Cluster

- GDTC 510 Teaching Language Arts (3.00)
- GDTC 511 Teaching Mathematics (3.00)

- GDTC 512 Teaching in Early Childhood/Kindergarten (3.00)
- GDTC 513 Teaching Across the Curriculum (3.00)

Second Language Teaching Cluster

- GDTC 520 Second Language Acquisition (3.00)
- GDTC 521 Teaching Second Language Pronunciation (3.00)
- GDTC 522 Teaching Second Language Vocabulary (3.00)
- GDTC 523 Teaching Second Language Grammar (3.00)

Academic Regulations

1. Academic Standing. Please refer to the Academic standing section of the Calendar for a detailed review of the Academic Regulations.
2. Time Limit. Please refer to the Academic regulations page for further details regarding the Time limits.

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New Program Proposal – Graduate Diploma in Teacher Certification

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1. EXECUTIVE SUMMARY

Program Overview

The Department of Education proposes to launch a graduate-level Diploma program in Teacher Certification, consisting of 30 credits. The proposed **Graduate Diploma in Teacher Certification (GDTC)** is a strategic response to the pressing needs within Québec's educational landscape: critical teacher shortage and teacher attrition in Québec, professional development for uncertified practicing teachers for specific challenges teachers encounter in classrooms, flexible schedule for work-life balance and more affordable education leading to the teaching license in Québec. The proposed start date of the program is the Winter term of the 2024-25 academic year.

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18 credits of Required Core Courses

Code and number	Course title	Credit value
GDTC 500	Introduction to the Program: The Teacher's Bootcamp	1.5
GDTC 501 + 502	The Teacher's Workshop (I & II)	3 (over two years)
GDTC 503	Planning and Implementing Learning Situations	3
GDTC 504	Evaluation Of and For Learning	3
GDTC 505	Fostering Diversity in the Classroom	3
GDTC 506	Inclusive Pedagogy	3
GDTC 507	Putting it all together: Portfolio Creation	1.5

12 additional credits of Required Courses chosen from:

Preschool and Elementary Teaching Cluster		
GDTC 510	Teaching Language Arts	3
GDTC 511	Teaching Mathematics	3
GDTC 512	Teaching in Early Childhood/Kindergarten	3
GDTC 513	Teaching Across the Curriculum	3
Second Language Teaching Cluster		
GDTC 520	Second Language Acquisition	3
GDTC 521	Teaching Second Language Pronunciation	3
GDTC 522	Teaching Second Language Vocabulary	3
GDTC 523	Teaching Second Language Grammar	3

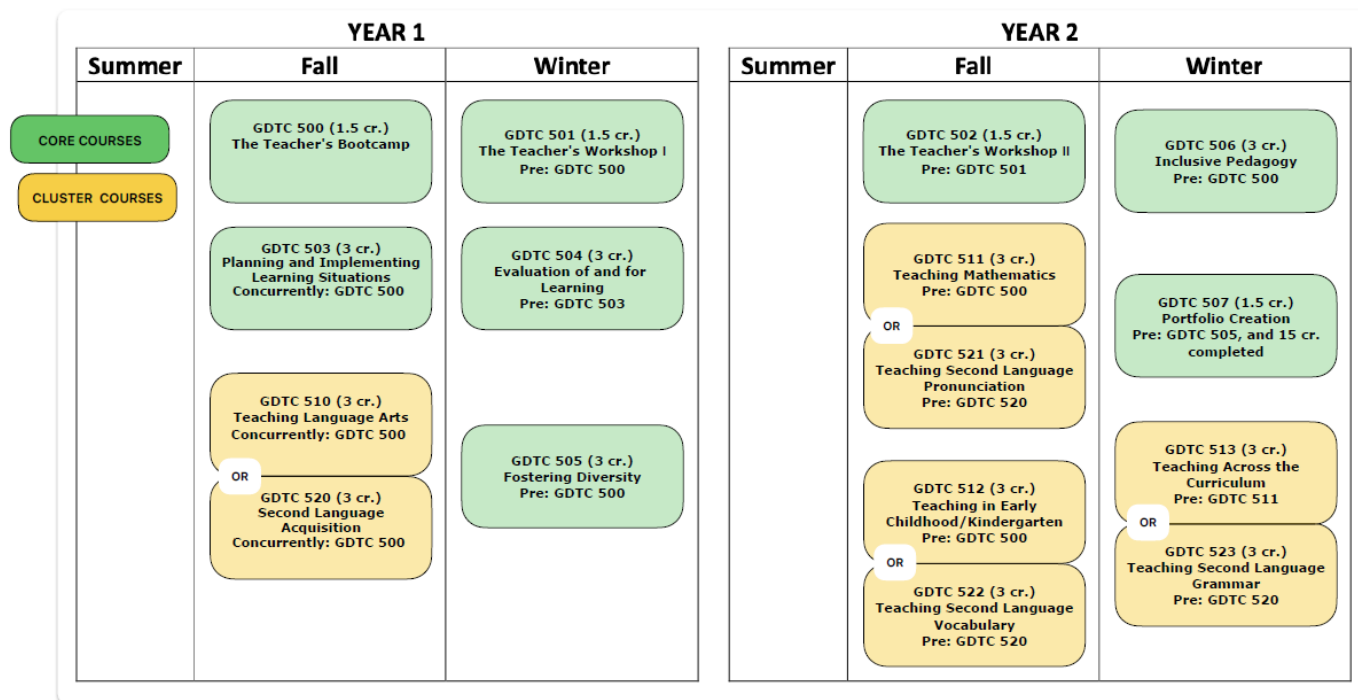
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2. PROGRAM IDENTIFICATION

2.1 Degree awarded:

Post Graduate Diploma

Le diplôme d'études supérieures spécialisées (DESS)

2.2 Discipline:

Teacher Education

2.3 Program Title:

Graduate Diploma in Teacher Certification

The program includes two clusters:

- i. Second Language Teaching Cluster (SLTC)
- ii. Preschool and Elementary Teaching Cluster (PETC)

2.4 Administrative location:

Department of Education, Faculty of Arts and Science, Concordia University

Sir George Williams Campus

1455 De Maisonneuve Blvd. W.

Montreal, Québec, Canada

H3G 1M8

3. FIELD OF STUDY AND RELEVANCE

3.1 Field of study

3.1.1 Brief presentation of the field of study and its evolution

Teacher education as a distinct and formalized area of training began to take shape in Canada, alongside of other countries in North America and Europe, in the early to mid-19th century. One key development was the establishment of "normal schools". These institutions were dedicated to the specific preparation of individuals for careers in teaching. The first normal school in Québec was established in 1857. Known as the "École Normale Jacques-Cartier," it was located in Montreal. The purpose of this institution was to provide formalized training for teachers, following the model of normal schools established earlier in other parts of North America and Europe.

Such schools evolved into teacher colleges and universities, offering more comprehensive teacher education programs, and expanding curricula to include a broader range of subjects and education theories. In the early 20th century, accrediting bodies and provincial education departments established standards for teacher education programs, ensuring that teachers met specific qualifications. The progressive education movement in the early to mid-20th century influenced teacher education, promoting active learning (i.e., learning by doing), challenging traditional teacher-centred approaches and promoting student-centred teaching.

During the 1960s and 1970s, significant teacher education reforms in most developed countries started to address racial and socioeconomic educational disparities and promoted more inclusive teaching. In the province of Québec, the Parent Commission, formally known as the Royal Commission of Inquiry on Education in the Province of Québec, was established in 1961 by the Lesage government. This commission, chaired by Mgr. Alphonse-Marie Parent, was tasked with examining the education system in Québec up to the 1960s. The comprehensive Parent Report put forward approximately 500 recommendations. The outcomes of the report paved the way for significant reforms in the education system. Among the most important, the Ministry of Education was created in 1964, ensuring a centralized, state-controlled education system that catered to the broader population. Also, The *Conseil supérieur de l'éducation* was established in 1964 to provide advice to the Minister of Education on various education-related matters. The age for compulsory schooling was raised from 14 to 16 and *Collèges d'enseignement général et professionnel* (CEGEPs) were introduced in 1967, replacing classical colleges previously administered by the Roman Catholic clergy. Emerging from the Quiet Revolution, the Parent Commission played a pivotal role in shaping a unified, comprehensive, and democratic education system accessible to all. This transformation contributed to the reduction of disparities among different demographics, including those based on gender, location (urban and rural), and language (English and French).

In the 21st century, there has been an increased emphasis on technology integration in the classroom and a formalization of the focus on special education and the needs of diverse student populations. In Québec, significant changes took place in 2001. A new Québec Education Program was introduced, and new guidelines for teacher education programs were implemented. The establishment of a reference framework for the teaching profession, centered around professional competencies, represented a clear push to professionalize teaching in Québec. For over a decade, universities have adhered to these professional competencies when drafting their teacher education programs and building undergraduate and graduate programs for teacher certification. In 2021, an updated framework was introduced, which does not represent drastic changes, but a revamping of some of the previous competencies and the addition of a new one focused on the ability to motivate students to learn.

Despite the advancements in the education system and the preparation of teachers, the persistent turnover and shortage of educators, a longstanding issue in Québec, has been further accentuated, rising to a situation that could be considered a crisis. According to la Vérificatrice Générale du Québec, Guylaine Leclerc, more than one-quarter of teachers (more than 30,000) who worked in the province's classrooms during the 2020-21 school year were not legally qualified and did not possess a teaching certificate or a provisional qualification. Québec's Ministry of Education is encouraging universities to offer uncertified teachers training to obtain a legal teaching qualification

(Chartrand & Sirois, La Presse, 2023)¹. Some universities in Québec, alongside those in the rest of Canada, have begun offering education programs centered on accessibility, flexibility, and a shorter duration. Maintaining high standards of teacher education programs remains a priority. Continuous research, innovation, and a commitment to improving teacher preparation are essential to ensure that educators are well-equipped to meet the ever-more-challenging and evolving needs of schools and learners.

3.1.2 Relevance of the program

The proposed **Graduate Diploma in Teacher Certification** is designed to reflect the local context in Québec schools and to respond to the most pressing needs and challenges of uncertified practicing teachers in the province. The program embodies unique characteristics, theoretical foundations, interdisciplinary connections, and potential for future developments as presented below:

Uniqueness from related programs:

- The program offers personalized learning pathways where course instructors work collaboratively with participants to develop unique learning cycles in each course based on learning needs, their own classroom challenges, and evidence-based assessment.
- The program focuses on specific learning outcomes and competencies in essential teaching knowledge and skills that participants are expected to demonstrate in their practice.
- The program offers flexibility in terms of when and how learning occurs. Participants can access resources online and tailor their study schedules to accommodate work or other commitments.
- The program operates within a deliberate practice framework where the participants' ongoing teaching tasks and classroom experiences are utilized to trigger the reflection process and the connections between theoretical concepts, practice, and exploration of areas for professional growth.

Theoretical approaches:

- The competency-based program aligns with constructivist learning theories and deliberate reflective practice approaches, emphasizing knowledge-building through authentic experiences, participatory action research, and self-directed learning.
- The program embraces andragogical principles encouraging adult learners to bring their unique experiences and motivations to their studies.

Links with other fields or disciplines:

The program incorporates elements from psychology, sociology, pedagogy, and subject-specific disciplines (e.g., mathematics and language arts) to prepare well-rounded educators.

Potential future developments:

The program aligns with Lifelong Learning concepts and principles. Future developments may explore ways to offer:

- ongoing professional development and credentialing opportunities for educators throughout their careers.

3.2 Areas of expertise

3.2.1 Program-specific features

The following are the main features of the proposed **Graduate Diploma in Teacher Certification**:

- **Competency-Based:** The program is competency-based, emphasizing the mastery of specific teaching competencies aligned with the Québec Reference Framework for Professional Competencies for Teachers, 2021.

¹ Chartrand, Suzanne-G., & Sirois, Geneviève (2023). *Des solutions crédibles à la pénurie*. La Presse. March 7, 2023. <https://www.lapresse.ca/debats/opinions/2023-03-07/penurie-denseignant.es/des-solutions-credibles-a-la-penurie.php>

- **Research-Infused Curriculum:** Action research and reflective practices are integral components of the program. Participants engage in research activities that bridge theory and practice, fostering critical thinking and evidence-based teaching.
- **Work-integrated Learning:** Participants reflect on their teaching practices, identify existing challenges, research solutions, and apply their findings into their practice.
- **Reflective Portfolio:** Throughout the program, participants maintain a reflective portfolio to document their growth as educators, incorporating their research findings, reflections on teaching practice, and evidence of competency mastery.
- **Experienced Faculty:** The program is led by experienced faculty who are experts in the field of education, offering mentorship and guidance to the program participants.
- **Joyful Resilience:** Participants engage in joyful resilience through interpersonal collaboration, exploring hypotheses beyond their current level of mastery to discover innovative solutions for existing challenges. These challenges are turned into opportunities, fostering a playful approach to continuous professional development.
- **Supplementary Knowledge Base:** The program requires a bachelor's degree for admission to ensure that participants bring foundational knowledge from other disciplines. This complements teaching in the classroom by introducing a supplementary knowledge base, and participants can draw from their existing experiences in the classroom.
- **Real-World Challenges:** The program is purposefully designed to address the current challenges in the workforce. The program participants working while studying is not seen as a flaw but as a strategic approach to address real-world challenges school teachers in Québec face, making the program relevant and responsive.

3.2.2 Program components

The program offers two specialized clusters: Preschool and Elementary Teaching and Second Language Teaching. Each cluster is designed to address the unique needs and competencies required in these specific teaching areas. The program includes an 18-credit common core (including an introduction bootcamp focused on the teaching profession in Québec, a program-long workshop for teachers, planning and implementing learning situations, evaluating student learning, inclusive pedagogies, diversity in education, and creation of professional teaching portfolios), providing essential knowledge and skills relevant to both clusters. The common core content aligns with the program's overarching competencies, ensuring that participants build a strong foundation for more specialized learning in their chosen clusters. This structure ensures that graduates have a common understanding of foundational principles while specializing in their chosen area of expertise.

- The Preschool and Elementary Teaching cluster is designed for individuals currently teaching or interested in teaching young children, typically from preschool (Kindergarten) through elementary school.
- The Second Language Teaching cluster is ideal for those currently teaching or interested in teaching second languages, such as English as a Second Language (ESL), French as a Second Language (FSL), or other foreign languages, at the elementary and secondary school levels.

Both clusters incorporate reflective practices, but the focus and content of reflection differ based on the cluster's specialization. The program's combination of competencies, action research, reflective practice, and practical experience ensures that graduates are well-prepared to excel in their respective teaching areas and contribute to the field of education as reflective, evidence-based practitioners.

4. PROGRAM RATIONALE

4.1 Socio-economic and socio-cultural opportunities

4.1.1 Societal need

Over the last few decades, Québec has suffered from an acute teacher attrition rate. 50% of teachers abandon the profession in the first five years of their careers (Mukamurera, Lakhali, & Tardif, 2019)². Some factors have been proposed to explain this situation such as the increasing workload and tasks complexity, successive budget constraints and curriculum reforms, new social phenomena within schools (e.g., changes in family structure, shifts in authority dynamics, cultural diversity, and school violence), and new educational policies emphasizing school inclusion, decentralization, and results-oriented management (Mukamurera & Balleux, 2013)³. In a report submitted by the Auditor General of Québec, more than one-quarter of teachers (i.e., more than 30,000) who worked in the province's classrooms during the 2020-21 school year did not have a teaching certificate or a provisional qualification (Lecavalier, La Presse, 2023)⁴. This situation can be described as a crisis, with a substantial number of classrooms being led by adults without a recognized teaching degree. Accordingly, the ministry has recommended a few concrete and immediate measures to be put in place, including offering uncertified teachers appropriate and accessible support so that these people can carry out their tasks and allow them to access training that will pave the way for them to obtain a legal teaching qualification, relaxing the conditions for obtaining the qualifying master's degree, and developing other training methods more suited to teachers already in the classroom than the four-year programs (Chartrand & Sirois, La Presse, 2023)⁵. Here are some key social needs that the **Graduate Diploma in Teacher Certification** can help address:

Addressing Teacher Shortage:

Ensuring that classrooms are led by qualified professionals is essential to providing students with a high-quality education and ensuring they have the support they need to succeed in school and beyond. The introduction of this program is a direct response to the teacher shortage in Québec and the recommendations made by the Ministry of Education to develop a shorter yet comprehensive path to teacher certification. It will also positively impact the social perception of the teacher's job by recognizing the professional training required. An action research-based high-quality program with reflective practice at its core, offered mainly remotely, can help to alleviate shortages by certifying individuals while they maintain their contracts in Québec's classrooms.

Addressing Teacher Burnout:

While training and certifying uncertified teachers in Québec is not a standalone solution, it can be a valuable component of a broader strategy to create a more supportive and sustainable educational environment, ultimately contributing to the prevention of burnout among certified teachers. By expanding the pool of certified teachers through training and certification programs, the workload burden on certified teachers may be eased. This can result in a more manageable work-life balance, reducing the risk of burnout.

Providing Essential Professional Development:

The main objective of the proposed program is to address the specific needs and challenges faced by uncertified teachers in Québec and offer an individualised, concise, and focused curriculum that covers essential pedagogical knowledge and techniques based on Québec's professional teaching competencies. This will allow uncertified teachers currently working in classrooms to attain formal teaching certification more rapidly than in traditional

² Mukamurera, J., Lakhali, S., & Tardif, M. (2019). L'expérience difficile du travail enseignant et les besoins de soutien chez les enseignants débutants au Québec. *Activités*, 16(1). <https://doi.org/10.4000/activites.3801>

³ Mukamurera, J., & Balleux, A. (2013). Malaise dans la profession enseignante et identité professionnelle en mutation: Le cas du Québec. *Recherche et Formation*, 74(3), 57–70. <https://doi.org/10.4000/rechercheformation.2129>

⁴ Lecavalier, Charles, *Le quart des enseignants non légalement qualifiés en 2020-2021*, La Presse, May 25, 2023. <https://www.lapresse.ca/actualites/education/2023-05-25/rapport-de-laverificatrice-generale/le-quart-des-enseignants-non-legalement-qualifies-en-2020-2021.php>

⁵ Chartrand, Suzanne-G., & Sirois, Geneviève (2023). *Des solutions crédibles à la pénurie*. La Presse. March 7, 2023. <https://www.lapresse.ca/debats/opinions/2023-03-07/penurie-denseignant.es/des-solutions-credibles-a-la-penurie.php>

programs. It also ensures that these educators refine their skills and thinking strategies, stay updated on best practices in education, and are well-equipped to support student learning and success.

Providing Affordable Education:

Teacher education is economically demanding, particularly because it is difficult to work while completing internships. Many uncertified teachers cannot afford the cost of a 4-year program while holding a job. A 30-credit program that is based on individual learning paths, flexible, and remote, will be more cost- and time-efficient without compromising professional development. This affordability can make teacher certification a realizable opportunity ensuring a more equitable access to the teaching profession.

Offering a Flexible Schedule:

Recognizing that many uncertified teachers work full-time while pursuing teacher certification, this program will offer flexible scheduling clusters, such as evening meetings with instructors and online coursework. This flexibility makes it more feasible for students to balance work, education, and other responsibilities.

Incorporating Mentorship and Support:

Mentoring has been shown to be a key element leading to a decrease in teacher attrition and an increase in teacher job satisfaction (Kutsyuruba et al., 2014)⁶. The teachers' sense of self-efficacy, understood as the beliefs in one's ability to execute the actions required to accomplish a task (Bandura, 1997)⁷, has been shown to correlate strongly with various significant educational outcomes, including teachers' perseverance, enthusiasm, dedication, and instructional methods. The opposite is also true. When teachers do not feel equipped for the profession's challenges, they are more prompt to abandon the profession (Tschannen-Moran & Hoy, 2001)⁸. The induction period is crucial to build strong sense of competence that will further develop throughout their careers (Gingras & Mukamurera, 2008)⁹. Another core aspect in this program is mentoring. The strong emphasis on mentoring will facilitate a more supportive and collaborative educational environment for new and existing teachers, offering individually tailored scaffolding to teacher certification.

4.1.2 Description of the Field in Québec

Teacher training programs and certification in Québec have transitioned over the years from a strong religious focus to a more inclusive and diversified approach to teacher preparation, focusing on meeting the needs of modern classrooms and learners. Since the creation of CEGEPS in 1967 and the Réseau de l'Université du Québec in 1969, universities in Québec began offering teacher education programs to provide a comprehensive and academic approach to teacher preparation governed by the Ministry of Education, which sets certification requirements and standards. There are French and English-language teacher training programs in Québec to serve both Québec's French-speaking and English-speaking communities.

In recent years, there has been a focus on ongoing professional development programs for qualified teachers leading to specialized certificates and diplomas (university and post-graduate levels) as well as mandatory workshops offered by the Québec school boards. In the late 20th century, Québec introduced alternative routes to teacher certification that were typically shorter in duration than traditional teacher education programs and focused on pedagogical training and classroom experience. Québec introduced these programs primarily in response to teacher shortages.

⁶ Kutsyuruba, B., Godden, L., & Tregunna, L. (2014). Curbing Early-Career Teacher Attrition: a Pan-Canadian Document Analysis of Teacher Induction and Mentorship Programs. *Canadian Journal of Educational Administration & Policy*, 161, 1–42.

<http://search.ebscohost.com/login.aspx?direct=true&db=eue&AN=98562204&site=ehost-live>

⁷ Bandura, A. (1997). *Self-efficacy: The exercise of control*. W H Freeman/Times Books/ Henry Holt & Co.

⁸ Tschannen-Moran, M., & Hoy, A. W. (2001). Teachers' Sense of Efficacy Scale Instrument. *Teaching and Teacher Education*, 17(1), 783–805.

⁹ Gingras, C., & Mukamurera, J. (2008). S'insérer en enseignement au Québec lorsqu'on est professionnellement précaire : vers une compréhension du phénomène. *Revue Des Sciences de l'éducation*, 34(1), 203–222.

Alternative programs such as the Certificate for Teachers program (*Certificat pour les enseignants*) allowed individuals with bachelor's degrees in specific subjects to earn a teaching certificate without completing a 4-year program. The programs consisted of 30 credits (which included a 6-credit stage).

Teacher training programs in Québec have also evolved to include specialization clusters, allowing teachers to become experts in specific subject areas or cycles and preparing them to work with diverse student populations, including students with disabilities. In the 2010s, Québec initiated programs to train Indigenous teachers to serve Indigenous communities and address Indigenous students' unique educational and cultural needs. Moreover, the teaching profession in Québec has become increasingly diverse, with educators from various linguistic and cultural backgrounds. For this reason and as a tool for quality assurance in teacher education, in 2001, Québec introduced a Framework for Professional Competencies for Teachers to clearly define the competencies expected of teachers, allowing institutions to assess and refine their programs to meet established standards and contribute to the overall quality of teacher preparation. In the Fall of 2021, Québec released an updated version¹⁰ of the framework, including 13 core professional competencies. This framework has been integrated into teacher education programs in Québec, including field experience and internship assessments.

Ongoing challenges associated with teacher training in Québec include but are not limited to teacher shortage, preparing teachers to work effectively with a wide range of students from culturally and linguistically diverse backgrounds, training teachers to become proficient in using technology as a tool for instruction, providing effective mentorship and ongoing professional development for new and experienced teachers, retaining qualified and experienced teachers, preparing teachers to work with students with special needs, and most importantly maintaining teachers' well-being and effectiveness in the classroom.

To address the teacher shortage and increase accessibility, some universities in Québec have begun offering online and blended programs, catering to individuals who may have family or work commitments, allowing them to pursue their certification while accommodating their other responsibilities.

4.1.3 Needs Assessments

Survey of Uncertified Teachers (with interviews)

In the Spring of 2023, we reached out to teachers on letters of tolerance to explore uncertified teachers' needs, preferences, challenges, and motivations. The survey respondents came from diverse backgrounds and had varying prior knowledge and experience levels. They also taught many subjects (general and specialized) in Québec elementary and secondary schools without the proper teaching permit (i.e., un Brevet). Out of the 106 respondents to the survey, 72% received a letter of tolerance at least once, and 77% held bachelor's degrees or more advanced credentials.

The survey results demonstrated that the need and desire to create a short, individually tailored teacher certification program is an urgent priority for uncertified teachers in Québec. Two specific questions addressed the creation of a teacher certification program at Concordia University: out of 106 respondents to the survey, 96% of respondents hope to complete an online, condensed teacher education program leading to the teaching license, and 86% of respondents are interested in acquiring a teaching license (i.e., un Brevet). The benefits of a fast-track teacher certification leading to the Brevet, as reported by most respondents, were:

- To receive formal teacher education training.
- To eliminate the stigma associated with being "unqualified or uncertified."
- To obtain job security, seniority, and benefits.
- To relieve stress caused by insecure employment conditions.

¹⁰ Québec. Ministère de L'éducation, 2021, *Référentiel de compétences professionnelles – Profession enseignante*. https://cdn-contenu.quebec.ca/cdn-contenu/adm/min/education/publications-adm/devenir-enseignant/reference_framework_professional_competencies_teacher.pdf?1611584651

As a follow-up to the survey, we conducted six interviews with teachers on letters of tolerance who disclosed their contact information in the survey and agreed to meet with us. The interviews aimed to help us tailor the proposed program to meet the diverse needs of our target audience. In selecting interviewees, we ensured we had representation from both elementary and secondary school teachers, diversity of experience, educational background, years of experience, and the subject(s) taught. The six interview results confirmed our findings from the survey and revealed more information related to teachers' goals and learning needs. Some common motivations for pursuing a short teacher certification program were the following:

- Getting official recognition for their experience in the classroom and professional competencies
- Getting paid for a stage or using any class they teach to complete the stage requirements.
- Finding a specialized online program offered in English responsive to their learning needs to be able to balance this education with their full-time job and family responsibilities.
- Being more equipped to differentiate instruction for the 30% of students with special needs in Québec's current classrooms.

Stakeholder Consultation:

To expand our range of stakeholders, we also engaged administrators with direct roles in hiring and retaining Québec teachers. Through this outreach, we consulted with Geneviève Beaumont-Frenette, Directrice de la valorisation de l'éducation et des politiques de formation du personnel scolaire at the Ministère de l'Éducation who shared with us the total number of letters of tolerance issued to all school boards in Québec in 2018-19 were 4344. We also interviewed two Directors of HR, the Director of the Teacher Recruitment Project for the English School Boards of Québec and the Director General of the Eastern Township School Board. The interviews provided additional perspectives on the issues faced by school boards regarding teacher hiring and validated data reported by teachers.

Key findings regarding hiring issues and stopgaps used by school boards include:

- Filling teacher positions has moved from a cyclical process to yearlong, as teachers increasingly quit and retire mid-year.
- Substitutes are increasingly fulfilling teacher roles in the classroom, leaving no subs for daily needs.
- Districts have been hiring abroad (e.g., France and Belgium) to compensate for the teacher shortages at English school boards.
- New graduates of undergraduate-level teaching programs (e.g., B.Ed.) are more interested in part-time or shortened work hours that do not overlap with regular school hours.
- At least one district, the Eastern Townships school board (ETSB), provides release time and French language assistance for those on Letters of Tolerance enrolled in the 30-Credit TELUQ Teacher Certification program.

Regarding a short teacher certification program:

- All interviewees viewed a short, accessible certification program as a critical need to hire and retain effective classroom teachers.
- All conveyed assurances that their boards would be willing to collaborate on student referrals and practica.
- All interviewees recommended such a program work to leverage existing support systems for new teachers, including mentoring and induction programs, which vary from one School Board or *Centre de Services Scolaires* to another.

4.1.4 Enrolment Forecasts

The proposed program is designed for individuals who already have a bachelor's degree and are teaching in Québec schools without an appropriate teaching permit (i.e., Brevet). The program will help uncertified teachers complete the program requirements to obtain a Québec teaching permit in a shorter timeframe, typically around two years. The courses are intensive and aim to provide essential (yet cutting-edge) teacher training in a condensed timeframe. Currently, Concordia University's Department of Education offers only traditional teacher education, with programs that are longer and typically span four to five years, including undergraduate coursework and student teaching. Therefore, the proposed new program and Concordia's existing programs will complement each other by offering diverse pathways to teaching, addressing immediate and long-term needs, providing a range of skill sets, offering flexibility, incorporating various pedagogical approaches, and collectively contributing to addressing teacher shortages and enhancing the overall quality of education.

The Graduate Diploma in Teacher Certification will admit **thirty (30)** applicants in the first year. After the first year, we envision doubling our enrolment provided the necessary teaching and administrative resources are made available.

4.1.5 Program Title

The title of the proposed program, “Graduate Diploma in Teacher Certification,” reflects the fact that teaching is a profession that requires a particular set of qualifications. The program will ensure that teachers in Québec are *qualified* individuals, who have developed the 13 professional competencies identified by the *Ministère de l’Éducation*. By acknowledging the training and qualifications necessary for effective teaching, the profession will be valorized to all educational stakeholders as well as the teachers themselves.

4.1.6 Regulatory and accreditive body

Graduates of the Graduate Diploma in Teacher Certification would be eligible to receive their “*Brevet de l’Enseignement*” (teaching license) in the province of Québec pending the approval of the Québec Ministry of Education. While this document is administered by the Québec government, graduates of teacher education programs in Canada are eligible to teach in other provinces and territories across the country.

In Québec, the *Comité d’agrément des programmes de formation à l’enseignement* (CAPFE) plays a crucial role in overseeing accredited teacher education programs. Its primary responsibility is to evaluate and approve teacher training programs to ensure they meet the established standards for quality and effectiveness. CAPFE is responsible for evaluating teacher training programs’ content, structure, and quality. Institutions seeking accreditation for their programs must undergo a thorough review by CAPFE to ensure they meet the established criteria. In addition, CAPFE works to maintain high standards in teacher education by assessing the curriculum, faculty qualifications, and resources available to students. This process helps ensure that future educators receive a robust and comprehensive education that aligns with Québec’s educational goals and standards. CAPFE conducts periodic reviews of accredited programs to ensure ongoing compliance with standards. This involves assessing any updates or changes made to the curriculum, faculty, or resources to ensure they continue to meet the required criteria. Based on their evaluations, CAPFE makes recommendations regarding program accreditation. They may suggest improvements or modifications to ensure that programs consistently meet or exceed established standards. CAPFE has the authority to grant or revoke accreditation based on their assessments. The role of CAPFE is instrumental in maintaining the quality and integrity of teacher education programs in Québec, contributing to the overall excellence of teacher education programs in the province. CAPFE will review the proposed “Diploma in Teacher Certification” to ensure its quality and standards.

4.1.7 Future Prospects for Graduates

Overall, employment prospects for Québec elementary and secondary school teachers are plentiful, as the dire teacher shortages in Québec’s urban and rural areas result in a steady demand for teachers. In August 2023, Education Minister Bernard Drainville revealed 8,558 vacant teaching positions. He indicated that Québec would have to rely on unqualified teachers or just one adult per class (Sylvain Roy Roussel, Radio-Canada, 2023)¹¹.

Given that the target audience of the proposed program is currently working in Québec public schools and possess prior classroom and professional experience, these candidates may have better employment prospects than newly graduated teachers entering the teaching career for the first time. The proposed program aims to ensure prospective teachers meet the certification requirements set by the Québec Ministry of Education to be eligible for teaching positions.

¹¹ Sylvain Roy Roussel, Radio Canada, August 23, 2023. *Il manque 8558 enseignants dans le réseau de l’éducation québécois*. <https://ici.radio-canada.ca/nouvelle/2005513/penurie-enseignants-Québec-bernard-drainville>.

4.1.8 Professional Mobility and Advanced Studies

The graduates from the proposed program will be able to have access to a wide range of employment opportunities, professional mobility, career advancements, and advanced studies.

In terms of employment opportunities, graduates can tailor their career paths to their interests and aspirations, whether that involves classroom teaching, school leadership, research, or advocacy. According to the National Occupational Classification (NOC) 2011¹², elementary school teachers teach basic subjects such as reading, writing and arithmetic or specialized subjects such as English or French as a second language at public and private elementary schools, while English as a Second Language teachers teach at public and private elementary and secondary schools (NOC 4031; NOC 4032, 2011)¹³. Elementary and secondary school teachers can specialize in specific areas such as special education, language instruction, or technology integration to open opportunities for specialized teaching roles, such as Special Education Teacher, ESL (English as a Second Language) Teacher, or Technology Integration Specialist.

Regarding professional mobility and career advancement, experienced teachers often have opportunities to take on leadership roles within their schools, such as becoming department heads, curriculum coordinators, mentors for new teachers, or vice-principal or school principal. Progression to vice-principal and education consultant in the education system is also possible with experience (NOC 4032; NOC 4031, 2011).

Moreover, after completing the proposed program, graduates can continue with a master's degree programs in education. These programs allow educators to specialize in areas such as curriculum development, educational leadership, educational technology, or special education. There are also Ph.D. degree programs for those interested in conducting in-depth research to contribute to the field's knowledge base and pursue academic careers.

4.1.9 Contribution to Québec's society

Graduates of the proposed Graduate Diploma in Teacher Certification will significantly contribute to Québec society, specifically in response to the teacher shortage. Here are some key contributions we anticipate our graduates will make:

- alleviate teacher shortages by filling vacant positions while ensuring classrooms are led by qualified teachers.
- develop long-term commitments to teaching, contributing to the stability of the teaching workforce.
- reduce the pressure and stress that current teachers are experiencing by sharing the workload and providing necessary support.
- enhance the quality of education in Québec as they will bring crucial pedagogical knowledge and teaching skills to the classroom and foster an environment conducive to learning.
- graduates currently living and teaching in remote or underprivileged areas, where shortages are often more acute, can complete the program remotely and continue to ensure that students in these regions have access to quality education.
- provide mentorship and support to newer or less experienced teachers, helping them adapt to the classroom environment and build their teaching skills.

4.2 Systemic Relevance and Opportunity

4.2.1 Similar programs internationally and in Canada

Based on an environmental scan of Teacher Certification programs at the university level across Canada and the United States, we found several programs tailored explicitly to those who want to enter the teaching profession or meet provincial teaching certification requirements. The following is a list of universities included in the survey offering accelerated teacher certification programs (that is to say, programs for students who have already

¹² National Occupational Classification (NOC) 2011. <https://www.statcan.gc.ca/en/subjects/standard/noc/2011/introduction>

¹³ National Occupational Classification (NOC), 2011.

<https://www23.statcan.gc.ca/imdb/p3VD.pl?Function=getVD&TVD=122372&CVD=122375&CPV=403&CST=01012011&CLV=1&MLV=4>

completed a bachelor’s degree and could develop the competencies required for teacher certification in a shorter amount of time):

Table 1. A list of Canadian and U.S. universities included in the environmental scan.

Universities in Canada	Universities in the U.S.
Brock University McGill University Simon Fraser University Université de Montréal Université du Québec en Abitibi-Témiscamingue (UQAT) University of Alberta University of British Columbia University of Calgary Université Laval Niagara University in Ontario University of Prince Edward Island Université de Sherbrooke University of Toronto University of Regina Université TÉLUQ York University	Drexel University California State University, East Bay Niagara University Rider University San Francisco State University University of Hawai’i at Mānoa University of Michigan

We examined seven one- or two-year Bachelor of Education programs and thirteen post-graduate certificates and master's degrees leading to teaching certification in preschool, primary or secondary education. Twelve (12) post-secondary institutions in Canada and seven (7) post-secondary institutions in the U.S. offer these programs. We looked at program description, learning outcomes, delivery methods, program length, admission cycles, concentrations, degrees offered, and value-added or innovative curriculum components for each institution. This section provides examples of these programs:

Bachelor's Degrees:

The University of Calgary offers a two-year community-based Bachelor of Education degree to mitigate the high turnover rate of teachers in rural and remote areas. This degree allows students with a bachelor’s degree to enrol in this program and remain in their home community for most of their studies while receiving online instruction and advisory support from the university. Students also gain teaching experience in their local community through Field Experience practicum placements. Graduates of this program meet the teacher certification requirements for the province of Alberta. York University offers a two-year consecutive (following the attainment of a bachelor’s degree), professional Bachelor of Education model for those interested in teaching K-12 students. Graduates of the B.Ed. program can teach in K-12 schools and are certified to teach in Ontario in three grade levels: primary-junior (Junior Kindergarten to Grade 6), junior-intermediate (Grade 4 to Grade 10) or, intermediate-senior (Grade 7 to Grade 12). We found similar programs at Brock University, the University of Prince Edward Island, the University of British Columbia, the University of Alberta, the University of Niagara in Ontario, and the University of Regina. All these programs take at least two years to complete except for the 12-month program at UPEI.

Post-secondary Certificates and Diplomas:

Simon Fraser University offers a 16-month in-person teacher education Professional Development Program (PDP) to help learners explore educational ideas and their application in the classroom. Upon successful completion, graduates of the program are recommended by SFU to the Teacher Certification Branch of the British Columbia Ministry of Education for a teaching certificate. The University of Michigan offers a 12-unit certificate as an avenue into the teaching profession for candidates who hold a bachelor's degree but have not completed an educator preparation program. In this program, candidates begin with a pre-service induction period that includes self-paced online coursework and a summer practicum experience working with children in an educational setting. Once this

pre-service induction is complete, candidates begin teaching under a Michigan interim teaching certificate with salary and benefits. They receive three years of ongoing, practice-focused, content-specific preparation and development to earn their Michigan standard teaching certificates.

The University of Hawai'i at Mānoa offers a 31-credit post-baccalaureate Certificate in Teacher Education to provide additional pathways to teacher licensure in grades K-6 for individuals with an undergraduate degree in a field other than education. It also provides a path to teacher licensure for paraprofessionals and long-term substitutes working in Hawaii public schools. Another model is a two-year master's degree leading to teacher certification offered by McGill University, Université de Montreal, Université Laval, Université de Sherbrooke, and University of Toronto, an online degree at Western Governors University, and a remote qualifying master's program offered jointly by Université du Québec en Abitibi-Témiscamingue (UQAT) and Université TELUQ (TELUQ).

4.2.2 Similar programs in Québec

So far, there are a few closely related programs in Québec to our proposed program:

- TELUQ– DESS in preschool education and primary education
- TELUQ–DESS in teaching English as a second language
- TELUQ–DESS in teaching French as a second language
- UQAT–DESS Qualifying in Secondary Education, Mathematics
- UQAT–DESS Qualifying in Secondary Education, French as a Second Language

The three 30-credit post-graduate diploma programs offered by TELUQ are designed for uncertified practicing preschool and primary school teaching staff with bachelor's degrees. The program includes eight core courses covering the fundamental knowledge and skills required to be effective pre-school, primary, or secondary school teachers and two internships. This program is intended exclusively for people referred by their school service center or school board.

The post-graduate diploma in Secondary Education Mathematics offered by UQAT is designed for uncertified practicing school teaching staff with bachelor's degrees in mathematics. The courses included in this program are focused on providing students with a deep understanding of the concepts of mathematics and how to teach them effectively to students in the secondary level. Similarly, the post-graduate diploma in teaching French as a Second language is designed for uncertified practicing school teaching staff with bachelor's degrees in French studies or equivalent. The courses included in this program are focused on helping students teach French effectively to students at the secondary school level. Both programs are exclusively offered for those with a proven employment link with a school service center. In addition, the programs aim to develop the thirteen (13) professional competencies identified in the Professional Teaching Skills Framework to obtain the teaching certificate issued by the Québec Ministry of Education.

4.2.3 Program Distinctive Characteristics and Contributions

The proposed competency-based program at Concordia University introduces several distinctive features. Firstly, the program is designed to meet participants where they currently stand, empowering them to tailor their learning journey and personalize their path toward program completion. Secondly, it capitalizes on the participants' knowledge, skills, and experiences, encouraging them to actively co-create knowledge instead of passively consume content. To facilitate this, the program will incorporate reflective practices and establish a clear connection between theory and practice to support participants in developing the thirteen (13) core professional competencies necessary for effective teaching. The participants will gain access to a comprehensive array of skill- and knowledge-based self-paced modules and the guidance of experienced educators and mentors remotely. These features will support aspiring teachers to cultivate self-awareness, analytical abilities, higher levels of self-efficacy, and a commitment to continuous professional development, all vital for effective teaching throughout their careers.

4.2.4 Relationship with other Programs in Québec

Like Concordia's proposed program, the five qualifying elementary and secondary education programs offered by TELUQ and UQAT reflect efforts to address teacher shortages, diversify the teaching workforce, and adapt to changing educational demands. These programs provide pathways into teaching for individuals with different educational backgrounds and teaching experiences, contributing to the overall quality and diversity of educators in the province. However, unlike these three traditional programs, students enrolled in Concordia's Post Graduate Graduate Diploma in Teacher Certification will not earn their degree solely based on completing a set of required courses but also by demonstrating mastery of specific competencies through ongoing assessments and a focus on real-world applicability.

4.2.5 Environmental scan highlights

- Teacher education and certification programs of less than four years are typically accessible only to those who hold a bachelor's degree.
- Although programs vary in length and number of credits, they share many commonalities, precisely admission requirements, program structure, course work and sequence, and the practicum component.
- The length and number of credits correlate highly with the final degree awarded to students.

4.2.6 Partnerships and collaborations

We aim to continue our collaboration with various service centres and school boards in Québec to identify candidates for the program, as well as individuals who could serve as mentors to students in the field. Given that the Department of Education currently offers two reputable teacher education programs (Early Childhood and Elementary Education and Teaching English as a Second Language), there are many schools and service centers/school boards with whom we have established positive working relationships. We will leverage these partnerships to ensure the best possible experiences and outcomes for the students enrolled in the Graduate Diploma in Teacher Certification.

While individuals will need to have a teaching contract to be enrolled in the Graduate Diploma in Teacher Certification, it is highly likely that they will not have the same contract throughout the program's two-year span. As it is quite common for uncertified teachers to be teaching at different grade levels year-to-year (or even within one year), participants in the program will be able to move from one teaching contract to another, provided they are teaching in a classroom. This arrangement ensures that uncertified teachers will be able to meet the program requirements while taking into consideration the current educational context.

Ongoing conversations and research collaboration with other universities within the Québec university sector will play a pivotal role in addressing the ongoing crisis of teacher shortages. Our intention is to foster meaningful partnerships with other academic institutions, focusing on the exchange of ideas, resources, and collaborative proposals. By engaging in shared initiatives, such as joint research projects, collaborative curriculum development, and the pooling of resources, universities can collectively contribute to innovative solutions for the teacher shortage challenge. These collaborations not only enhance the overall quality of teacher education programs but also ensure a more efficient and strategic response to the shortage crisis. Through the synergy of diverse perspectives and expertise, universities can collectively work towards producing well-prepared educators, thereby positively impacting the educational landscape in Québec.

The proposed program envisions establishing robust links with various existing programs at Concordia University, fostering a collaborative and interdisciplinary approach to teacher education. Specifically, close connections will be forged with the current teacher education programs in the Department of Education to facilitate the exchange of best practices, resources, and research opportunities. Additionally, strong affiliations will be cultivated with programs within the Faculty of Arts and Science, including those dedicated to languages such as Spanish and French, and programs from disciplines like mathematics, history, philosophy, and other subjects where students could consider teaching as a career.

4.3 Institutional Relevance and Opportunity

4.3.1 Integration of the program into institutional development plans

The development of a **Graduate Diploma in Teacher Certification** is an excellent opportunity to address four critical areas of Concordia's Strategic Directions Plan:

- **Teach for Tomorrow.** The program's focus on competencies, real-world application, and mentorship reflects an understanding of the changing landscape of education. By preparing teachers to adapt to new challenges and technologies, the program aligns with the institution's vision of providing education that fits the times. In addition, competency-based education allows for personalized learning journeys tailored to individual needs. This aligns with the institution's goal of delivering education that is connected and responsive to each participant's unique requirements and aspirations.
- **Get your Hands Dirty.** Including real-world experiences through work-integrated learning and focusing on application in real classrooms allows students to deepen their learning by directly engaging with the challenges and opportunities present in educational settings. This aligns with the strategic direction's goal of using rich experiences outside the classroom to enhance the depth of learning.
- **Embrace the City, Embrace the World.** By training uncertified teachers in Québec and offering them a route to become certified, the program serves the public interest by ensuring educators meet recognized standards for teachers in Québec. This commitment to public service aligns with the institutional mission to make a societal and public impact through providing quality education. The program also becomes a strategic initiative in achieving broader public policy goals related to education.
- **Go Beyond.** The program's impact extends beyond the classroom to the broader community. The program actively engages with and positively impacts the community by providing certified teachers, aligning with the institution's mission to go the extra mile for members of our community.

In addition, the proposed program is a way to advance Concordia's goal of promoting **equity, diversity and inclusion (EDI)** and providing responsive education within the institution and beyond. The program prepares a more diverse teaching force by attracting individuals with diverse backgrounds and experiences and addressing the teacher shortage, particularly in remote regions and regions with diverse populations. It also ensures students in remote communities can access qualified teachers who understand and appreciate their cultural and linguistic diversity. This aligns with the principles of EDI, ensuring that educators reflect the diverse student population and fostering a sense of inclusivity. Offering a certification pathway for uncertified teachers promotes inclusivity and diversity in the teaching profession, ensuring that the teaching workforce reflects the diversity of the communities it serves.

4.3.2 Status of the program in relation to other programs offered by the institution

The competency-based diploma will complement the Bachelor of Arts in Early Childhood and Elementary Education and the Bachelor of Education in Teaching English as a Second Language. The program will be a valuable professional development opportunity for individuals with prior teaching experience. It will offer diverse pathways to teaching, addressing immediate and long-term needs, providing a range of skill sets, offering flexibility, incorporating various pedagogical approaches, and collectively contributing to addressing teacher shortages and enhancing the overall quality of education.

The program addresses a specific niche in the market by targeting individuals with a minimum of five years of teaching experience and valid ongoing teaching contracts (e.g., letters of tolerance) in Québec schools. This strategic focus allows the institution to tap into a new demographic without directly competing with existing programs.

4.3.3 Demonstration of existing expertise in the field

Concordia University has a strong reputation and long history of successful teacher education programs, including the Bachelor of Arts in Early Childhood and Elementary Education (ECEE), and the Bachelor of Education in Teaching English as a Second Language (TESL). The department has strong faculty expertise in teacher education, and a diverse

group of educators committed to excellence in teaching, research and community service. They are well known for their strong research profiles that inform their teaching and afford graduate students the opportunity to work on cutting edge research. They are also passionate about teaching an essential missing component, an emerging area, or responding to cultural transformations that still need to be created within the current curriculum. Given that the new proposed program capitalizes on the expertise of teacher education scholars and faculty members, the Faculty of Arts and Science's Department of Education is the most appropriate unit to house the proposed program.

5. PROGRAM OBJECTIVES

5.1 Output Profile

The exit profile of the graduates of this program is aligned with and guided by the Reference Framework for Professional Competencies for Teachers (2021). Upon successful completion of the **Graduate in Teacher Certification**, graduates are expected to demonstrate the following competencies:

- Act as a cultural facilitator when carrying out duties
- Master the language of instruction
- Plan teaching and learning situations
- Implement teaching and learning situations
- Evaluate learning
- Manage how the class operates
- Take into account student diversity
- Support students' love of learning
- Commit to own professional development and to the profession
- Mobilize digital technologies
- Act in accordance with the ethical principles of the profession

This exit profile will guide the design of the program learning outcomes, curriculum, assessments and learning activities.

5.1.2 Appropriateness of the level of study of the program

Firstly, the proposed **Graduate Diploma in Teacher Certification** offers a flexible and practical educational cluster to meet various learning needs and professional goals. It is appropriate for participants with bachelor's degrees who possess an adequate academic background and foundational understanding to engage with more advanced and complex concepts at the diploma level. These practicing teachers' prior knowledge will allow them to explore subjects in greater detail, conduct action research, and produce scholarly work, leading to a deeper and more nuanced understanding of the teaching field.

Secondly, some participants may enter our competency-based program with extensive prior teaching experience. They may already possess valuable classroom management skills and teaching strategies. Others may have strong content knowledge in the subject they teach but have limited knowledge of pedagogical principles and instructional strategies. Our program is designed to accommodate participants with varying levels of prior teaching skills and knowledge. The program will offer flexibility, support, and personalized learning pathways to ensure that all participants progress towards mastery of the required competencies, regardless of their starting point.

Thirdly, the program's structure, length, and delivery method can be particularly beneficial for practicing preschool, elementary and secondary school teachers with full-time teaching contracts. A shorter, remote graduate diploma is more time-efficient and cost-effective than a full bachelor's or master's degree in education. In addition, the preestablished admission requirements will ensure that participants are adequately prepared for the curriculum, contribute to the overall success and satisfaction of both participants and faculty members and help maintain the program's academic standards.

Finally, this post graduate diploma will help uncertified practicing teachers finesse their teaching skills, promote best practices in education, and support student learning and success. The credentials the program graduates will receive, if recognized by the Ministry of Education and led to the "Brevet," will add value to these uncertified teachers' educational profiles, providing them with better job opportunities, job security, and stability.

5.2 General and specific program objectives

The general objectives of the Graduate Diploma in Teacher Certification are to address the teacher shortage, diversify the teaching workforce, and adapt to changing educational demands in Québec. Other important objectives include:

- Provide alternative training pathways to non-certified teachers with different knowledge, backgrounds and experiences. This diversity enhances the teaching environment by bringing in a range of perspectives and expertise, ultimately enriching the educational experience for students.
- Collaborate with school boards to identify individuals with the right teaching qualities and aptitude and ensure that the program attracts candidates well-suited for the teaching profession.
- Create a community of participants/teachers to network, connect and engage in professional discussions to promote resilience and adherence to the profession.

By incorporating these objectives, the program aims to address immediate workforce challenges and contribute to the long-term strength and diversity of the teaching profession in Québec.

The learning objectives of the proposed program are aligned with the Professional Competencies for Teachers outlined by the Ministry of Education. The competencies are further broken down into assessment descriptors, which are presented in the table below.

Table 2. A list of the assessment indicators associated with their respective competencies.

Descriptors for Assessment	Competencies
<ul style="list-style-type: none"> - Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students. - Build teaching and learning situations that are organized coherently and meaningfully in accordance with the Québec school program, including cultural reference points. - Act as a mediator between the students' culture, their cultural reference points, the school culture, and disciplinary content. - Situate students' learning in a cultural context that connects the past, present, and future. - Support the development of critical thinking and reflexivity among students regarding digital and media environments. 	Act as a cultural facilitator when carrying out duties
<ul style="list-style-type: none"> - Spark interest in the language of instruction. - Promote the language of instruction as a cultural object and a symbolic universe. - Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing. - Adjust their language register based on the interlocutor and the communication intention. - Incorporate a diversity of expression forms in teaching and learning situations, both orally and in writing, to support learning. - Master the language specifics inherent to their teaching discipline or disciplines. 	Master the language of instruction
<ul style="list-style-type: none"> - Develop sequences and teaching and learning situations that take into account the logic of the curriculum, students' prior knowledge, and their preconceptions, with a perspective of planning short-term, medium-term, and long-term learning. - Ensure maximum alignment between the intention behind the training activity, teaching and learning situations, and assessment during and at the end of the activity. - Integrate activities into teaching and learning situations that support the transferability of learning. - Document pedagogical and didactic choices based on research findings. 	Plan teaching and learning situations
<ul style="list-style-type: none"> - Implement teaching and learning situations that clarify the intended learning outcomes, verify students' preconceptions, draw on their prior knowledge, and align with a logic of continuity in learning. - Assess the coherence of the teaching and learning situations implemented in relation to the content and organization of the Québec school program. 	Implement teaching and learning situations

<ul style="list-style-type: none"> - Explicitly outline the approaches and strategies gradually mastered since the beginning of their training that make tasks stimulating and diverse for students while fostering their autonomy and supporting their engagement. 	
<ul style="list-style-type: none"> - Design learning assessment tools rooted in the curriculum and taking into account the characteristics and needs of students. - Explicitly state the purposes of learning assessment to question their teaching planning and, if necessary, modify it accordingly. - Compare the effectiveness of a variety of means for collecting meaningful and relevant data in assessing students' learning. - Explain the foundations of their decisions in evaluative judgments regarding students' learning, especially their progress. - Communicate assessment results, emphasizing students' strengths and challenges, and considering the emotional dimension of assessment. - Regularly provide feedback to students with the aim of supporting their learning, progress, and engagement. 	Evaluate learning
<ul style="list-style-type: none"> - Establish a safe and respectful climate with students that fosters the development of living together in diversity. - Organize the functioning of the class group in a way that allows students to continue their development in terms of learning and social and relational skills. - Create an environment that supports students' empowerment and progressive autonomy. - Ensure effective management of the time allocated for teaching and learning, as well as the organization of space and materials. - Implement appropriate interventions based on the observation of signs of demotivation and misunderstanding. - Regulate disruptive behaviors in the conduct of teaching and learning situations. 	Manage how the class operates
<ul style="list-style-type: none"> - Adapt teaching and learning situations based on the needs, abilities, and backgrounds of students. - Implement interventions that consider the issues related to inclusive education and cooperative strategies that take into account the diversity of students. - Prioritize grouping modalities that consider pedagogical intentions and the differentiated learning needs of students. - Strike a balance between personalized interventions and interventions for the entire class. - Establish complementary relationships with members of the school team. - Implement intervention plans or learning support plans in collaboration with other professionals. 	Take into account student diversity
<ul style="list-style-type: none"> - Give meaning and value to learning by establishing connections with everyday life situations and the cultural reference points of the student. - Build teaching and learning situations explicitly anchored in the students' fields of interest. - Cultivate positive relationships with students to create optimal conditions for learning. 	Support students' love of learning
<ul style="list-style-type: none"> - Define the actions implemented during their teacher training that contributed to the valorization of the teaching profession. - Explain the evolution of their reflective stance since the beginning of their teacher training. - Determine the plan for continuing education to ensure greater mastery of their skills. - Identify the primary contributions of research data to the practices of teachers. - Justify the rigor of their assessments of the validity of the documentary sources consulted to support their interventions. - Document the contributions of specialized books related to student education in their teacher training journey. 	Commit to own professional development and to the profession

<ul style="list-style-type: none"> - Utilize digital technology as a means of inclusion and to address diverse needs. - Integrate technological tools or digital platforms based on the purposes of teaching and learning situations to support student learning. 	Mobilize digital technologies
<ul style="list-style-type: none"> - Document the major ethical issues of the teacher in terms of integrity in the performance of their duties. - Argue the changes integrated into their training concerning values and attitudes. - Explain the practices adopted in the classroom or with the community that promote the inclusion of students. - Adopt inclusive practices to prevent any form of discrimination against students. 	Act in accordance with the ethical principles of the profession

6. REGULATORY FRAMEWORK

6.1 Admission Requirements and Processes

A summary of the admission requirements and processes is given below, for further description of the admission requirements and processes for Concordia University, please consult the [Graduate Calendar](#).

6.1.1 Admission requirements for the program

- Bachelor's Degree. Applicants must have completed a high-standing bachelor's/baccalaureate (or equivalent). High standing is defined as honours, specialization, or a GPA equivalent to a B average.
- Teaching Experience. Applicants must have a minimum of five years of teaching contracts (full- or part-time). Applicants will be prioritized according to both their total number of hours accumulated and length of the contracts.
- Recommendation letter from a school principal or a service centre/school board.
- Letter of Tolerance. Letter of Tolerance is issued from a School Board or *Centre des Services Scolaires* in Québec or a teaching contract valid during the duration of the program.
- Proficiency in English. Applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the English language proficiency page for further information on requirements and exemptions.

6.1.2 Minimum and maximum program capacity, as applicable

The expectation is for the Graduate Diploma in Teacher Certification to attract up to 30 participants per year. To ensure that the program is financially sustainable, we will evaluate the programs' enrolment numbers and capacity once we reach stabilization in 3 years.

6.1.3 Criteria and selection procedures

Applicants' academic transcripts will be reviewed to ensure they meet the specified criteria (Bachelor's degree with high standing (honors, specialization, or GPA equivalent to a B average).

Applicants will need to submit proof of English language proficiency as per the requirements outlined on the English language proficiency page.

Applicants must provide documentation, such as reference letters or employment verification, to confirm their teaching experience.

Applicants must submit a valid Letter of Tolerance along with their application. The letter should be issued by a recognized authority in the education sector in Québec.

6.1.4 Description of the case analysis process

Concordia's case analysis process ensures a comprehensive evaluation of applicants, considering their academic background, teaching experience, language proficiency, and adherence to specific regional requirements, as indicated by the Letter of Tolerance from Québec education authorities. The following process aims to identify candidates who meet the minimum criteria and demonstrate a commitment to and preparedness for the teacher certification program:

- The admissions committee will review all applications to ensure they meet the academic and experience criteria.
- The committee will verify English language proficiency for non-native English speakers based on the specified requirements.
- The committee will verify the teaching experience of applicants based on submitted documentation, such as reference letters or employment records.
- The committee will carefully review the Letter of Tolerance to ensure it meets the specified criteria and is issued by a recognized authority in the Québec education system.
- The admissions committee will make selection decisions based on the overall assessment of each applicant's academic qualifications, teaching experience, English language proficiency, and the validity of the Letter of Tolerance.

- Applicants will be informed of the admissions decision, and successful candidates will receive instructions on the next steps for enrollment.

6.2 Commitment and structure of the program

The program will be offered on a part-time basis and will take two years to complete. All thirty credits are obligatory, of which 18 credits are common core, and 12 credits are specific to the participant's chosen cluster. For further information on the program structure, please refer to Section 7.3.

6.3 Program oversight

6.3.1 Leadership and composition of the Program Committee

Dr. Teresa Hernandez-Gonzalez and Dr. Nathalie Rothschild will serve as the Program Director and Associate Program Director respectively for the first year of the proposed program. In the second year of the program, the faculty member holding the Extended-Term Appointment (ETA) (see section 9.1.2) will assume Program Directorship, with Dr. Teresa Hernandez-Gonzalez taking on the role of the Associate Director.

As it involves teacher training, the proposed program will become part of the [Concordia Teacher Education Council](#) (CTEC), which oversees the three existing teacher training programs at Concordia. The CTEC is directed by Roma Medwid and is made up of the Program Directors for each teacher education program, as well as the Chairs of the Departments of Education and Faculty of Fine Arts, and the Associate Dean of Academic Programs. The group draw on the diverse professional expertise of its members and will work collaboratively to ensure the success of the program.

6.3.2 Study Regulations

Uncertified teachers/participants enrolled in this program will be subject to the [academic regulations](#) defined by the Concordia University's School of Graduate Studies and published [online](#).

6.3.3 Collaborative Arrangements with other Units, Departments, Faculties, and Institutions

Members of the Department of Education who will be involved in the proposed program are actively engaged with other Units, Departments, Faculties, and Institutions. These established relationships will contribute to the success and vitality of the proposed program.

Dr. Nathalie Rothschild is currently the Director of [Concordia's Observation Nursery](#), which supports the Early Childhood and Elementary Education program by giving students an opportunity to develop observation skills, complete internships, and practice communicating with parents and families. Participants in the proposed program would also be able to benefit from the nursery, to observe and develop their own skills working with young children.

Dr. Teresa Hernandez Gonzalez is currently the subject-matter expert on a [Virtual Reality project](#) in collaboration with the lab for Innovation in Teaching and Learning. The findings from this study related to the development of self-efficacy in teaching will have important implications for the proposed program.

7. PROGRAM STRUCTURE

7.1 Activities

7.1.1 Common Core and Cluster Courses

The **Graduate Diploma in Teacher Certification** is comprised of 30 credits (i.e., 11 new courses and seminars), of which eighteen (18) credits are common core courses and twelve (12) credits specific to participants' chosen cluster: 1) Preschool and Elementary Teaching cluster, and 2) Second Language Teaching cluster. The courses are delineated in the table below.

Table 3. A list of the program's common core and cluster courses.

18 credits of Required Core Courses		
Code and number	Course title	Credit value
GDTC 500	Introduction to the Program: The Teacher's Bootcamp	1.5
GDTC 501 + 502	The Teacher's Workshop (I & II)	3 (over two years)
GDTC 503	Planning and Implementing Learning Situations	3
GDTC 504	Evaluation <i>of</i> and <i>for</i> Learning	3
GDTC 505	Fostering Diversity in the Classroom	3
GDTC 506	Inclusive Pedagogy	3
GDTC 507	Putting it all together: Portfolio Creation	1.5
12 additional credits of Required Courses chosen from:		
Preschool and Elementary Teaching Cluster		
GDTC 510	Teaching Language Arts	3
GDTC 511	Teaching Mathematics	3
GDTC 512	Teaching in Early Childhood/Kindergarten	3
GDTC 513	Teaching Across the Curriculum	3
Second Language Teaching Cluster		
GDTC 520	Second Language Acquisition	3
GDTC 521	Teaching Second Language Pronunciation	3
GDTC 522	Teaching Second Language Vocabulary	3
GDTC 523	Teaching Second Language Grammar	3

The program adopts a competency-based model with blended and remote courses and will take two years to complete. The 13 core professional competencies for teachers are mapped onto each course (see appendix 12).

Action research, viewed as a form of investigation designed for use by teachers to attempt to solve problems and improve professional practices in their own classrooms (Parsons & Brown, 2002)¹⁴, will be a key component in each course of the program.

The program will start with a dynamic and immersive "Bootcamp" seminar to introduce participants to the program's guiding principles of action research and reflective practice. This introductory seminar will serve as a gateway to our Graduate Diploma in Teacher Certification and support participants in skeletonizing the structure of their teaching portfolios. The seminar will also cultivate a supportive and collaborative community within the cohort and establish valuable social networks. Participants will also attend in-person, full-day in-person workshops (GDTC 501 and GDTC 502) offered by a Pedagogue-in-Residence throughout the program. Each workshop is focused on one teaching aspect (e.g., classroom interventions, diverse learning needs, evaluation, and assessment, life-work balance, etc.)

¹⁴ Parsons R. D. & Brown K. S. (2002). *Teacher as reflective practitioner and action researcher*. Wadsworth/Thomson Learning.

The rest of the courses are delivered remotely and online and offer a series of self-paced, competency-based learning modules. In consultation with the course instructor, participants will select topics for explorations relevant to the specific competencies of the course, the participants' teaching contexts, and their strengths. They will identify helpful resources to make decisions grounded in current theoretical knowledge and develop an action plan to improve teaching practices. They will engage with the resources through a user-friendly online platform. Participants will be encouraged to implement their action plan in their classrooms, monitor their plan's effects, and collect evidence to inform the process. Reflective practice is a fundamental aspect of each course. Participants regularly self-reflect on their strategies and teaching practices, identifying areas for improvement and enhancement. The course instructors will act as mentors, guiding participants through their action research projects and providing support, and as evaluators, offering feedback and evaluating the acquisition of the targeted competencies. One-on-one mentoring sessions are available for participants to discuss specific course challenges and strategies.

In each course, participants will engage in a blended approach combining video-based feedback with in-person visits/observations to replace a traditional stage/internship in a school setting. Particularly, participants will be asked to record videos of classroom instruction and will receive annotated feedback from instructors and mentors as an alternative to traditional internships or teaching experiences, especially since the target audience of this program is already teaching courses. Wherever possible, instructors will visit the participants onsite or remotely to provide immediate feedback.

When appropriate, participants will also participate in peer-reviewed discussions, offer constructive feedback to peers, and collaborate on their projects. This will help them gain different perspectives on their teaching and receive much needed support in their learning paths. Matching peers will be based on location, personal preferences, perceived experiences, or experience teaching specific subject matter/grade level.

Throughout the program, the portfolios will be used to inform the development of individualized learning plans for participants and as evidence of their mastery of the professional competencies. In each course, participants will produce and submit pieces of evidence of the development of the targeted competencies, meet remotely with their instructor to evaluate their level of mastery of the targeted competencies, and develop a learning path with an action research plan.

The Putting it all Together: Portfolio Creation “bootcamp” seminar at the end of year two will serve as the program’s capstone project. In this bootcamp participants will demonstrate the knowledge, skills, and competencies they have acquired throughout the program through a sharable digital portfolio. The choice of the overarching theme to frame the portfolio, the structure and the medium will be decided in consultation with the instructor, and should align with the program's goals and competencies, as well as the individual interests and strengths of the candidates and help them demonstrate their readiness and effectiveness as educators.

7.1.2 Accreditation

The program will be accredited by the Ministry of Education in Québec, or any committee designed by the Minister to accredit teacher education programs. Accreditation will be based on the perceived capacity of the program to support the development of the 13 professional competencies.

7.2 Pedagogical approaches

7.2.1 Pedagogical Approaches and Innovation in Teaching and Learning in all Courses

Throughout the program and across all courses, a range of pedagogical approaches are applied to foster a rich and transformative learning experience:

- **Action Research:** At a broad level, action research can be described as a deliberate and methodical investigation conducted by practitioners into their own work, typically following a cyclical and iterative process involving at least four key phases: planning, acting, observing, and reflecting (Kemmis & McTaggart,

1982)¹⁵. This approach is grounded in evidence and begins with cultivating participants' natural curiosity and encouraging them to ask questions about their teaching practices, students' learning experiences, and classroom dynamics. Participants collect, analyze, and use empirical data to inform their decisions and actions, ensuring their teaching strategies are research-backed and effective.

- **Reflective Practice:** Throughout the program, participants engage in reflective practice focusing on specific aspects related to the competencies ascribed per course. They critically examine their teaching experiences, the impact of their action plans, and their assumptions and beliefs. They engage in hypothesizing and implementing their hypothesis to gather evidence of the development of the set of competencies.
- **Professional Portfolios:** Participants document their action research results and reflections in their teaching portfolios. These portfolios provide tangible evidence of an educator's competence and proficiency in various teaching competencies and skills and support their professional growth, accountability, and the quality of teaching and learning within educational settings.
- **Targeted Feedback:** Participants will record and share videos of their teaching practices with instructors and mentors and receive specific and targeted feedback to address their needs and competencies. This feedback is often more detailed and actionable than what might be provided during traditional classroom observations.
- **Work-Integrated Learning:** The participants' ongoing classroom experiences are the basis for experiential learning, reflection, and action research. These learning experiences allow them to apply theory to practice and make learning more meaningful.
- **Peer Mentoring:** Sharing experiences and portfolios for feedback and review and working with course instructors and colleagues foster peer collaboration and a culture of continuous improvement within educational institutions.

7.2.1 Cooperative Education Options

This program does not have any cooperative education options. However, participants reflect on their teaching practices, identify existing challenges or areas for exploration, research interventions, and apply their findings to their own classrooms throughout the duration of their studies.

7.2.2 Mode of Instruction

The program delivery offers a balance between synchronous, in-person workshops and asynchronous (self-paced) learning where participants engage with course content on their own time, meet remotely with their course instructors, access readings, and engage with multimedia resources to support their learning, and remote mentoring and supervision.

7.2.3 Blended Learning

The following courses will be offered in a blended learning format:

Introduction to the Program: The Teacher's Bootcamp (1.5 credits)

The Teacher's Workshop (3 credits)

Putting all together: Portfolio Creation (1.5 credits)

However, the rest of the program courses will be offered remotely (i.e., a mix of online synchronous one-on-one meetings with the instructor and online asynchronous components and activities).

7.3 Typical student path

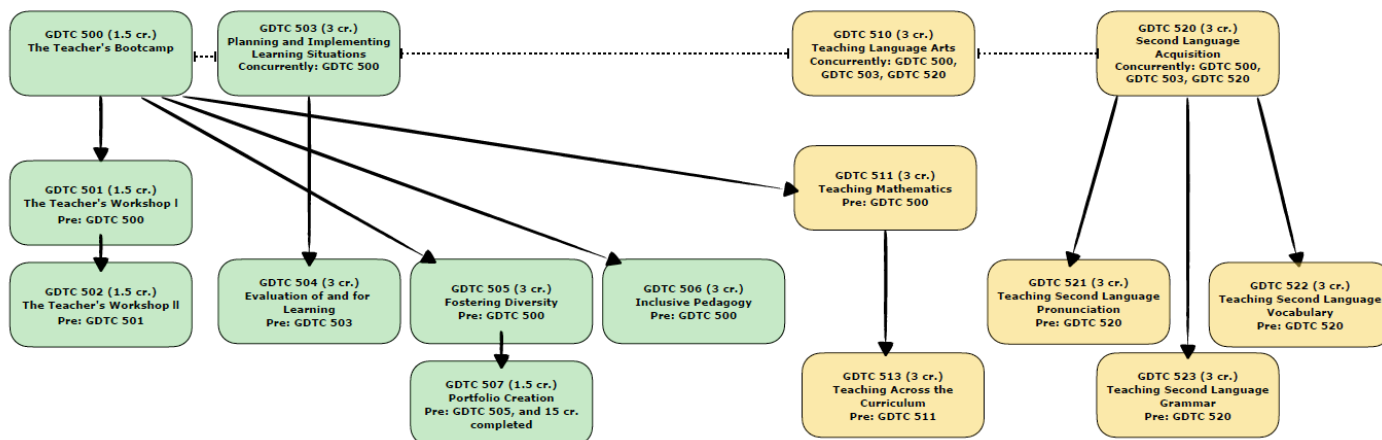
Program participants will typically complete this program in four terms, with 7.5 credits each term. The program will begin with an introductory "Boot Camp" course and end with a culminating "Portfolio Creation" course. As participants are required to have a teaching contract to meet program requirements, and it is possible that they may have contract interruptions throughout, they may need to withdraw from the program at certain points. However, they will be able to pick it back up the following term if a contract is resumed. For the course sequence of the program's first three cohorts, please refer to Appendix 13: Course Sequences.

¹⁵ Kemmis, S., McTaggart, R., & Nixon, R. (2014). The action research planner: Doing critical participatory action research. In *The Action Research Planner: Doing Critical Participatory Action Research*. <https://doi.org/10.1007/978-981-4560-67-2>

The tables below outline the typical path of a participant in the proposed program (see Appendix 13 for enlarged version of this table).

Table 4. Course sequence and pre-and co-requisites.

YEAR 1			YEAR 2		
Summer	Fall	Winter	Summer	Fall	Winter
CORE COURSES	GDC 500 (1.5 cr.) The Teacher's Bootcamp	GDC 501 (1.5 cr.) The Teacher's Workshop I Pre: GDC 500		GDC 502 (1.5 cr.) The Teacher's Workshop II Pre: GDC 501	GDC 506 (3 cr.) Inclusive Pedagogy Pre: GDC 500
	GDC 503 (3 cr.) Planning and Implementing Learning Situations Concurrently: GDC 500	GDC 504 (3 cr.) Evaluation of and for Learning Pre: GDC 503		GDC 511 (3 cr.) Teaching Mathematics Pre: GDC 500 OR GDC 521 (3 cr.) Teaching Second Language Pronunciation Pre: GDC 520	GDC 507 (1.5 cr.) Portfolio Creation Pre: GDC 505, and 15 cr. completed
CLUSTER COURSES	GDC 510 (3 cr.) Teaching Language Arts Concurrently: GDC 500 OR GDC 520 (3 cr.) Second Language Acquisition Concurrently: GDC 500	GDC 505 (3 cr.) Fostering Diversity Pre: GDC 500		GDC 512 (3 cr.) Teaching in Early Childhood/Kindergarten Pre: GDC 500 OR GDC 522 (3 cr.) Teaching Second Language Vocabulary Pre: GDC 520	GDC 513 (3 cr.) Teaching Across the Curriculum Pre: GDC 511 OR GDC 523 (3 cr.) Teaching Second Language Grammar Pre: GDC 520



7.4 Feedback and evaluation

7.4.1 Assessment of Prior Learning

Assessing participants' prior learning is crucial to tailor the instruction to their individual needs and ensure they start at an appropriate level of proficiency. Below is a list of evaluation methods that will be used in each course to create a comprehensive understanding of participants' prior learning:

- Self-Assessment and Reflection: participants will be encouraged to engage in self-assessment and reflection exercises to evaluate their knowledge, skills, and experiences related to the course's competencies.
- Review of portfolios: at the beginning of each course, participants will be required to develop their portfolios from previous teaching experience, professional development activities, or coursework related to the course-associated competencies to provide insight into their prior learning experiences, achievements, and skillsets.
- Interviews: at the beginning of each course, the course instructor will conduct one-on-one interviews with participants to gather information about their educational and professional backgrounds, teaching experiences, and perceptions of their own strengths and areas for growth.
- Classroom video recording: participants will be assigned performance-based tasks and required to record them to demonstrate their practical teaching skills. This provides a clear indication of their current teaching abilities, as well as helps to identify areas for ongoing development.

The course instructors will also use data generated from the evaluation tools mentioned above to inform personalized learning plans, identify areas where participants need additional support, and help them set goals for competency attainment.

7.4.2 Formative and Authentic Assessments

Participants are assessed both formatively, with ongoing feedback to inform their development, and through authentic assessments (e.g., their action plans, applied interventions, reflections, and professional portfolios), to evaluate their ongoing learning and competency development throughout each of the program courses (see Appendix 14 for examples of templates for evaluation of learning).

7.4.2 Pass/Fail Grading System

As the Graduate Diploma in Teacher Certification is a competency-based program, all courses will be evaluated on a pass/fail basis. The reasoning behind the pass/fail evaluation is as follows:

- As participants in the program will already be working in Québec's schools, the purpose of evaluating them is to determine whether they have developed each of the professional competencies associated with each course to a degree that is acceptable for a teacher, rather than the level of the competency development.
- Given that the majority of the work will be done in the classrooms themselves, it will be difficult for course instructors to assign a letter grade to students' work. Rather, through the student's documentation that demonstrates evidence of their learning, the course instructor will be able to assess whether the competency has been developed. The same system is used currently for our internship courses in the TESL and ECEE programs, and allows students, internship supervisors, and cooperating teachers to focus on learning, feedback, and growth.
- At the end of the program, students will be recommended for the teaching brevet in the province of Québec. The brevet is the same for every person, regardless of their grades in their teacher education program (provided they meet the minimum grade requirements). Therefore, the outcome for students will be the same, and students can focus more on developing the professional teaching competencies identified by the Ministry of Education.
- The idea of this program is to ensure graduates are competent and effective teachers. When grades are given in a course, there is a normal curve expected. In this case though, we want all of our students to demonstrate high levels of competence, so giving grades and assuming normal curves would not be appropriate.

7.5 Alignment of activities, skills and program objectives

The common core courses (18 credits in total) in the **Graduate Diploma in Teacher Certification** program (including The Teacher's Bootcamp; The Teacher's Workshop; Planning and implementing learning situations; Evaluation of and for learning; Fostering Diversity in the classroom; Inclusive Pedagogy; and Portfolio Creation) play a crucial role in helping students achieve the intended skills and program objectives. Here's a breakdown of how each course contributes to the development of these skills and program outcomes/objectives:

- **GDTC 500 - Introduction to the Program: The Teacher's Bootcamp.** This seminar discusses the teaching profession in Québec and covers topics such as ethics, professionalism, and the broader social and cultural contexts in which education operates as well as the structure of the program. Through this course, participants acquire the necessary information and tools to be successful in the program. They will be introduced to critical inquiry, action research and reflection, how to apply interventions to their teaching practices and classrooms and start developing their professional portfolios.
- **GDTC 501 - The Teacher's Workshop I:** This dynamic and interactive set of workshops will support participants to identify and address aspects of the teaching profession that they wish to explore and address in further depth (i.e., classroom management, emotional regulation, teacher resilience, teacher and learner motivation). Throughout the course, participants are encouraged to reflect on their teaching methods and explore ways to expand the boundaries of their practice. Engaging in discussions with their peers and instructors, participants will develop problem-solving and critical thinking skills required to tackle the challenges relevant to their individual practice.
- **GDTC 502 - The Teacher's Workshop II:** This set of workshops builds on GDTC 501 by delving more deeply into the challenges participants face in their teaching practice. The problem-solving and critical thinking skills targeted in GDTC 501 will be applied to critically analyze research related to these challenges. Throughout the course, participants will reflect on their teaching methods and implement evidence-based strategies.
- **GDTC 503 - Planning and Implementing Learning Situations:** This course focuses on enhancing participants' skills and strategies in planning and implementing effective learning situations, by ensuring alignment between targeted competencies, learning objectives, and assessment plans. Participants will plan and implement lessons relevant to their current teaching context. Motivation for learning, student diversity, and effective integration of digital technologies will be explored as guiding principles in impactful learning.
- **GDTC 504 - Evaluation of and for Learning:** This course builds on the planning skills targeted in GDTC 503 and focuses on Assessment FOR learning and evaluation OF learning. Participants will implement strategies related to Assessment FOR learning, such as involving students in the assessment processes, providing formative feedback, and supporting learners to be autonomous in the monitoring of their progress. In addition, participants will put in practice Evaluation OF Learning, such as gathering evidence for both detailed and holistic reports of student outcomes. Ultimately, participants will develop skills to effectively implement assessment and evaluation techniques to support student learning and growth.
- **GDTC 505 - Fostering Diversity in the Classroom:** This course focuses on the importance of building classroom climates that respect and value diversity. Participants will explore practices that celebrate the unique lives and contributions of each student, build trusting relationships, and address discrimination. Participants will consider how technology, motivation, and classroom rules and routines can champion diversity within the classroom.
- **GDTC 506 - Inclusive Pedagogy:** This course is designed to equip participants with the knowledge, skills, and strategies necessary to create inclusive classrooms where children with special needs receive the support and accommodations they need to thrive. Participants will implement intervention or learning support plans, striking a balance between personalized interventions and interventions for the entire class. Participants will leverage the knowledge and skills that ensure that all students, regardless of their exceptionalities, can succeed in an inclusive classroom setting.
- **GDTC 507 - Portfolio Creation:** This final intensive seminar is the culmination of the Graduate Diploma in Teacher Certification program. Participants will be guided in showcasing the knowledge and skills accumulated throughout the courses. Participants will demonstrate their ability to act as knowledge facilitators, manage class operations, take into account student diversity, and use digital technologies effectively. This course includes the creation of a professional portfolio, aligning with the commitment to professional development and ethical principles.

In addition, the Preschool and Elementary Teaching cluster courses contribute to the achievement of the program learning outcomes:

- **GDTC 510 - Teaching Language Arts:** This course enables participants to acquire the necessary skills for developing a stimulating and effective language arts program for kindergarten and elementary grades. Current theories of literacy development and implications for planning and instruction are addressed. The course focuses on listening, speaking, reading, and writing, emphasizing the integration of language arts activities into other subject areas.
- **GDTC 511 - Teaching Mathematics:** This course introduces a conceptual analysis of school mathematics and its application to early childhood and elementary classrooms. Topics include numeracy acquisition, counting, whole number operations, and problem solving. Emphasis is placed on the development of children's thinking and pedagogical practices aimed at assisting students to think mathematically.
- **GDTC 512 - Teaching in early childhood/Kindergarten:** This course addresses theoretical and applied aspects of early childhood education, including the educational and developmental needs of young children, models of education, the role of the teacher, play-based curriculum and instruction, health and safety issues, and the design of effective kindergarten learning environments.
- **GDTC 513 - Teaching Across the Curriculum:** This course supports participants in planning cross-curricular lessons or units of instruction that incorporate multiple subject areas authentically. The course highlights the importance of asking essential questions that allow students in elementary grades to engage with curricular content in meaningful and relevant ways.

Similarly, the Second Language Teaching stream courses contribute to the program's learning outcomes as such:

- **GDTC 520 - Second Language Acquisition:** This course explores the theoretical and practical aspects of second language acquisition (SLA). Participants will explore the key principles and methodologies involved in acquiring a second language, with a focus on effective teaching strategies for language learners. Topics include the role of input, interaction, and feedback in language acquisition, and the influence of cultural and social factors. Emphasis is placed on fostering a supportive and inclusive learning environment for young learners developing proficiency in a second language. The course integrates research-based insights to guide educators in designing effective language acquisition activities.
- **GDTC 521 - Teaching Second Language Pronunciation:** This course is designed to equip educators with the knowledge and skills necessary for effective instruction in second language pronunciation. Participants will explore theories and practices related to teaching phonetics, intonation, and articulation to young language learners. The curriculum emphasizes practical strategies for addressing common pronunciation challenges, incorporating technology-enhanced learning tools. The course integrates research-driven insights to guide participants in improving pronunciation skills when working with young language learners.
- **GDTC 522 - Teaching Second Language Vocabulary:** In this course, participants explore effective strategies for teaching and expanding vocabulary in the context of second language acquisition for young learners. Participants will examine theoretical foundations of vocabulary development. Emphasis is placed on practical methodologies for designing interactive vocabulary activities, incorporating context-based learning, and leveraging technology to enhance vocabulary acquisition. The course aims to foster a rich and diverse lexical repertoire among young second language learners.
- **GDTC 523 - Teaching Second Language Grammar:** This course is designed to help participants explore contemporary theories and research on grammar acquisition, with a focus on practical strategies for interactive and communicative approaches to grammar instruction. The curriculum covers essential aspects such as syntax, morphology, and sentence structure, addressing common challenges faced by young language learners. Participants will develop the skills necessary to guide second language learners in enhancing grammatical awareness and proficiency.

Collectively, these courses contribute to achieving the program objectives. Each course addresses specific program objectives, providing a comprehensive and coherent pathway for students to achieve the intended learning

outcomes. The program employs a combination of theoretical learning, practical application, reflective practice, and mentorship to ensure that students are well-prepared to enter the teaching profession with the required skills and commitment.

For a comprehensive curriculum map, showing the alignment between the skills that the program aims to deliver, the learning objectives and the learning activities (courses, laboratories, internships, etc.), please refer to Appendix 12.

8. SUPPORT FOR STUDENT SUCCESS

8.1 Financial support

No financial aid or awards are available for the proposed diploma program, given that the program is at the diploma level and is offered part-time. However, the program will cover the participants' travel expenses (including accommodation and per diem for meals) for the on-campus boot camp and workshops.

8.2 Student Services

There are a variety of student services, workshops, and events offered by various offices in Concordia and various Student Associations. Below is a list of these services:

- Admission advising
- Immigration advising
- Academic advising & support
- Financial support
- Health & well-being
- Career & job resources
- Student life
- Student Emergency and Food Fund
- Student Academic Services (SAS)
- International Students Office (ISO)
- Student Success Centre
- Financial Aid and Awards Office
- Health Services
- Campus Security
- Access Centre for Students with Disabilities (ACSD)
- Multi-Faith and Spirituality Centre
- Career and Planning Services (CAPS)
- Otsenhákta Student Centre
- Dean of Students
- LIVE Centre
- IT support (AITS)
- ASFA Student Life Volunteer Pool
- Student Associations
 - CECEEA: Concordia's Early Childhood & Elementary Education Association
 - DOEIGSA: Department of Education Interdisciplinary Graduate Student Association
 - TESLSA: Teaching English as a Second Language Student Association

The above-mentioned student associations within the Department of Education are tailored to help students navigate the different programs offered by the department and their many requirements.

8.3 Academic and student life

There are countless opportunities for students to be involved in the community and associations within the university.

- Multi-faith and Spirituality Centre

A home on campus for all those who wish to celebrate the human spirit, open to all students, whether spiritual, secular or religious.

- Centre for Gender Advocacy

An independent, student-funded organization mandated to promote gender equality and empowerment, particularly in marginalized communities.

- Centre for Creative Reuse

CUCCR is dedicated to diverting materials from inside Concordia's waste-stream and offering them to the general community free of cost.

- D3 Center for Innovation and Entrepreneurship

Center for Innovation and Entrepreneurship provides the necessary tools, resources and knowledge to move from idea to impact with confidence.

- The SHIFT Centre for Social Transformation

Supports existing and emerging social transformation initiatives that unite to create a more just, inclusive and broadly prosperous Montreal.

- Sustainability Hub

Promoting sustainability-related initiatives, tools, resources, research, funds and programs to the Concordia community.

- Spark!

Inspiration for students to actively participate in learning experiences at Concordia that have a positive impact on their success.

- Otsenhákta Student Centre

An on-campus resource for First Nations, Métis and Inuit students to find community, plan social events and access resources to help them achieve academic success.

- University of the Streets Café

A program that organizes bilingual public conversations in cafés and community spaces across Montreal.

- Zero Waste

An initiative focused on reducing waste on campus and encouraging the Concordia community to reduce, reuse, recycle and rot.

- Black Perspectives Office

Connects and supports activities related to Black perspectives, initiatives and scholarship on campus and within the broader Montreal community.

- Québec Public Interest Research Group

An inclusive resource centre that supports grassroots activism around diverse social and environmental issues and aims to inspire social change.

- Office of Community Engagement

Connecting faculty, staff and students with members of the wider Montreal community in order to build meaningful relationships.

- Queer Concordia

An on-campus resource centre for queer, lesbian, gay, trans, two-spirited, bisexual, asexual, intersex, questioning and allies.

- Best Buddies

In collaboration with Best Buddies Canada to create fun, meaningful and lasting friendships.

- ECEESA: Concordia's Early Childhood & Elementary Education Association
- DOEIGSA: Department of Education Interdisciplinary Graduate Student Association
- TESLSA: Teaching English as a Second Language Student Association

Academic representatives will collect student feedback from courses and give it to the Graduate Program Director. Social representatives will be responsible for organizing social events for students, including student, staff, and faculty mixers every term and fundraising events.

9. RESOURCES

9.1 Faculty Resources

9.1.1 List of Faculty Members and Stakeholders

Within Concordia's Department of Education, there are four full-time faculty members who have committed to participating in the program (CVs are attached as appendices):

1. Dr. Teresa Hernández González serves as the Program Director for Teaching English as a Second Language degrees at Concordia. She holds a PhD in Education. With over 20 years in teacher education, she worked as a teacher and consultant for the English/Spanish British Council-Ministry of Education Bilingual Program. Her expertise includes second language pedagogy, language classroom interaction, language learning strategies for young learners, learning-oriented assessment, and the gamification of teaching and learning. She is also deeply committed to teacher education and mentoring. Dr. Hernández González will serve as the Director for the first year of the proposed program, and the Associate Director for the second year.
2. Dr. Nathalie Rothschild: Dr. Rothschild is the Program Director and Internship Coordinator of the Bachelor of Arts in Early Childhood and Elementary Education. She has a PhD in Developmental Psychology and Education, teaches courses in early childhood, kindergarten, and elementary pedagogy, and supervises students in their teaching internships. Her research interests and expertise include children's outcomes and experiences in French immersion programs (particularly in kindergarten), early childhood education, and teacher education and training. She is a certified teacher and has experience teaching in English and French immersion at the kindergarten and elementary levels. Dr. Rothschild will serve as the Associate Director for the first year of the proposed program.
3. Dr. Saul Carliner: Dr. Carliner is the Chair of the Department of Education, and a faculty member in Educational Technology. He has a PhD in Instruction Technology and has had substantial tenures in both academia and industry in the fields of learning and communication. Dr. Carliner's teaching and research focus on the design of instructional and informational materials, the management of groups that produce these materials, and related issues of policy and professionalism. As the Chair of the Department of Education, Dr. Carliner will play a role in the administration and support of the proposed program.
4. Dr. Holly Recchia: Dr. Recchia is the Associate Chair of the Department of Education, and a faculty member in Early Childhood and Elementary Education and Child Studies. Her research focuses on children's social and moral development in the context of their close relationships with parents, siblings, and friends. She is especially interested in how children make sense of and resolve conflicts with others. Dr. Recchia currently teaches the Culture and Citizenship in Québec methods course (formerly Ethics, Religion, and Culture) in the Early Childhood and Elementary Education program. As the Associate Chair of the Department of Education, Dr. Recchia will play a role in the administration and support of the proposed program.

9.1.2 Teaching Responsibilities

Note: The teaching responsibilities for this program will mostly be carried out by two new hires requested: an Extended Term Appointment and a Pedagogue-in-Residence. These positions are outlined following the table below. These two hires will teach all general courses (15-credits for the ETA and 3 credits for the Pedagogue-in-Residence), as well as some of the cluster-specific courses, to be assigned once hiring has been completed and we have a sense of their areas of expertise. The remaining cluster-specific courses will be taught by part-time faculty. This breakdown is further described below:

General courses (18 credits): 15 credits taught by ETA; 3 credits taught by Pedagogue-in-Residence

Second-Language Teaching Cluster courses (12 credits): 3 credits taught by ETA/Pedagogue-in-Residence; 9 credits taught by part-time faculty

Preschool and Elementary Teaching courses (12 credits): 3 credits taught by ETA/Pedagogue-in-Residence; 9 credits taught by part-time faculty

Table 5. A list of faculty members who will teach each course or activity.

Course	Instructor
GDTC 500 Introduction to the Program: The Teacher’s Bootcamp	ETA
GDTC 501 + 502 The Teacher’s Workshop	Pedagogue-in-Residence
GDTC 503 Planning and Implementing Learning Situations	ETA
GDTC 504 Evaluation <i>of</i> and <i>for</i> Learning	ETA
GDTC 505 Fostering Diversity in the Classroom	ETA
GDTC 506 Inclusive Pedagogy	ETA
GDTC 507 Portfolio Creation	ETA
GDTC 510 Teaching Language Arts	Part-time faculty
GDTC 511 Teaching Mathematics	Part-time faculty
GDTC 512 Teaching in Early Childhood/Kindergarten	Part-time faculty
GDTC 513 Teaching Across the Curriculum	ETA/Pedagogue-in-Residence
GDTC 520 Second Language Acquisition	Part-time faculty
GDTC 521 Teaching Second Language Pronunciation	Part-time faculty
GDTC 522 Teaching Second Language Vocabulary	Part-time faculty
GDTC 523 Teaching Second Language Grammar	ETA/Pedagogue-in-Residence

9.1.3 Hiring Plans

In order for the proposed program to run successfully, two faculty positions have been requested and approved. The first is an Extended Term Appointment (ETA). The ideal candidate for this position will have at least a master’s degree in one of the following areas: Early Childhood Education, Primary Education, Second Language Teaching/Learning, or a related field, as well as teaching experience in early childhood, primary, or second language contexts with young learners. This will ensure that the new hire will be able to contribute not only to the proposed program, but also to the existing programs and initiatives in the Department of Education. The ideal candidate will also be familiar with the context of education in Québec, the Québec Education Program (QEP) and the Québec Reference Framework for Professional Competencies. Experience working with teacher candidates and mentoring student teachers is also a requirement. As this person will eventually serve as Program Director, leadership experience is an asset. The person hired for this position will teach 5 of the 6 general courses for all students in the proposed program, as well as one course in either the SLT or PET clusters, depending on their area of expertise. They will ultimately serve as the Program Director, starting in year 2 of the program, with Dr. Teresa Hernandez-Gonzalez providing support, and then independently beginning in year 3.

The second position is a Pedagogue-in-Residence. The ideal candidate for this position will have a master’s degree in one of the following areas: Early Childhood Education, Primary Education, Second Language Teaching/Learning, or a related field. The candidate will be a licensed teacher and have teaching experience in early childhood, primary, or second language contexts with young learners, in a range of settings in Québec or elsewhere. The candidate will demonstrate the ability to establish relationships with school boards, service centers, independent schools, and other educational stakeholders, as well the ability to support the students in their practice and provide thoughtful and practical suggestions for resources and experiences. The person hired for this position will teach the Teacher’s Seminar for all students in the proposed program, as well as one course in either the SLT or PET clusters, depending on their area of expertise. They will also develop and manage the bank of resources associated with the proposed program and will be the one to suggest resources for both instructors and students that can support the development of the professional competencies associated with each course. Finally, the Pedagogue-in-Residence will act as the primary liaison between the program and the schools in which students are working.

Given that there are two program clusters reflecting expertise in early/primary teaching and second language teaching, we will ensure that these areas are reflected in at least one of the two new hires.

Department Hiring Committees will be formed as soon as the program is approved at the Department and Curriculum committee levels. Both positions will begin in August, 2024.

9.1.4 Support measures for faculty

The Concordia Center for Teaching and Learning (CTL) offers support for new faculty, including an [orientation session](#) and support in various areas such as creating course outlines, using technology to support learning, etc. The newly hired faculty will also be mentored by Dr. Teresa Hernandez Gonzalez and Dr. Nathalie Rothschild, who are experienced teacher education program directors.

9.2 Administrative and support staff

This program will require administrative support beyond what is currently available in the Department of Education. In order to facilitate recruitment, admissions, and registration, 10-hours/week of administrative support will be required beginning as soon as the program is approved.

9.3 Material, technological and library resources

- **Action Research Repository:** The Pedagogue-in-Residence will be tasked with curating a library of resources to complement the action research cycles. According to each course's learning objectives, in collaboration with the course instructor, the Pedagogue-in-Residence will compile videos, articles, books, manuals, webpages, and other resources available to the participants. In addition, Concordia's Webster Library holds a Curriculum Collection Guide. In collaboration with the person responsible for this service, the Pedagogue-in-Residence will inform students of the resources available. The existing TESL and ECEE Resource Centres will also help and support as required. All resources will be available to the participants in the program via a carefully curated repository.
- **Mentorship Networks:** Each participant will be connected to other participants and members of the wider teaching community to gain support and foster a sense of collective efficacy.
- **Recording and Video Annotation Software:** Participants will be given existing equipment such as a recording kit with an iPad-mini, a tripod, and a microphone to record their teaching as a way to collect pieces of evidence. VoiceThread will be used to annotate video recordings. Each participant and the course instructor will engage in a conversation rooted in video analysis over teaching practices.
- **Teacher Education Resource Centers:** The TESL Resource Centre and the ECEE Resource Centre will serve as hubs for collaborative work among the participants in the program. Specialized workshops, collaborative projects, specific mentoring around an area of teaching practice, and other initiatives will take place within the Resource Centres.

10. BUDGET ESTIMATES

10.1 Budget Table

Table 6. Summary Budget Table.

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total	
Tuition Fee								
Tuition (FTE)	\$	41,966	\$	83,910	\$	83,910	\$	377,586
Grants								
Teaching Grant (WFTE)	\$	143,546	\$	287,091	\$	287,091	\$	1,291,910
Support Grant (FTE)	\$	35,790	\$	71,580	\$	71,580	\$	322,110
Total grants	\$	179,336	\$	358,671	\$	358,671	\$	1,614,020
Additional Funding External	\$	-	\$	273,920	\$	-	\$	273,920
Total Revenue	\$	-	\$	495,211	\$	442,581	\$	2,265,535
EXPENSES								
TEACHING								
Tenure Track	\$	-	\$	-	\$	-	\$	-
Extended Term Contrats	\$	-	\$	101,966	\$	101,966	\$	509,778
Limited Term Contracts	\$	-	\$	-	\$	-	\$	-
Lecturers	\$	-	\$	-	\$	-	\$	-
Course remissions	\$	-	\$	12,500	\$	12,500	\$	62,500
Technical support	\$	-	\$	-	\$	-	\$	-
Part Time Contracts	\$	-	\$	25,000	\$	25,000	\$	100,000
Teacher's Assistants	\$	-	\$	6,960	\$	-	\$	13,920
Stipends	\$	-	\$	-	\$	-	\$	-
Other	\$	-	\$	260,000	\$	210,000	\$	1,100,000
ADMIN STAFF								
Administrative Staff	\$	-	\$	31,575	\$	31,575	\$	157,875
Total Payroll	\$	-	\$	412,991	\$	387,991	\$	1,944,073
OTHER EXPENSES								
Total Other Expenses	\$	-	\$	-	\$	-	\$	-
Total Expenses	\$	-	\$	412,991	\$	387,991	\$	1,944,073
Page 1 of 1, prepared on 09-04-24								
CONCORDIA UNIVERSITY SURPLUS / (DEFICIT)	\$	-	\$	82,220	\$	54,590	\$	321,461

10.2 Budget Rationale

The program will offer the following number of courses in each year (see Appendix for a detailed outline):

1. Year 1 = 10.5 credits for the first program cohort *
2. Year 2 = 22.5 credits for the first program cohort plus 15 credits for the second cohort (total of 37.5 credits) *
3. Year 3 = 9 credits for the first program cohort plus 15 credits for the second cohort plus 15 credits for the third program cohort (total of 39 credits) *
4. Year 4 = 15 for the third program cohort and 15 credits for the fourth cohort (total of 30 credits)
5. Year 5 = 15 credits for the fourth program cohort and 15 credits for the fifth program cohort (30 credits)

* The typical number of credits offered each year is 30 credits. Because the first cohort will exceptionally start in the Winter, while all other cohorts will begin in the Fall, Year 1 credits are reduced, and Years 2 and 3 credits are higher. As of Year 4, the number of credits offered each year will be 30. (For course sequence refer to Appendix 13.)

Course remissions for the program director and associate director are required to fulfill the delegated administrative duties.

Two Teaching assistants will be needed in the program's first two years to support the Pedagogue-in-Residence in curating and developing resources for the courses.

This program will require administrative support beyond what is currently available in the Department of Education. To facilitate recruitment, admissions, and registration, 10 hours/week of administrative support will be required beginning as soon as the program is approved.

Additional funding from the government will cover the annual salary of the Pedagogue-in-Residence in the first year (approx. 95 K) as well as travel expenses for approx. 30 participants (travel expected for "bootcamp" seminar (6 days) plus six workshop sessions (approx. 3000 \$ per participant)).

We expect 30 students to enroll in this program each year. This is the number of students we can mentor and supervise without requests for additional resources in the form of tenure-track faculty.

Refer to Appendix 11 for a detailed program revenue and expenses.

APPENDICES

- Appendix 3: Course outlines and descriptions
- Appendix 5: Needs Analysis, Surveys, Market Analysis, Environmental Scans
- Appendix 6: Letters of Support
- Appendix 8: Faculty CVs
- Appendix 11: Full detailed program expenses and revenues
- Appendix 12: Curriculum Mapping
- Appendix 13: Course Sequences
- Appendix 14: Templates for Evaluation of Learning

Summary of Changes (New Graduate Program (Fast Track))

Course Changes:

	Subject Code Change	Catalogue Number Change	Title Change	Description Code Change	Prerequisite Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Component Change	Mode of Instruction Change	Cross-listed Course Change
GDTC 500 Introduction to the Program: The Teacher's Bootcamp New	X	X	X	X			X	X	X	
GDTC 501 The Teacher's Workshop I New	X	X	X	X	X		X	X	X	
GDTC 502 The Teacher's Workshop II New	X	X	X	X	X		X	X	X	
GDTC 503 Planning and Implementing Learning Situations New	X	X	X	X	X	X	X	X	X	X
GDTC 504 Evaluation of and for Learning New	X	X	X	X	X		X	X	X	
GDTC 505 Fostering Diversity in the Classroom New	X	X	X	X	X		X	X	X	
GDTC 506 Inclusive Pedagogy New	X	X	X	X	X		X	X	X	
GDTC 507 Portfolio Creation New	X	X	X	X	X		X	X	X	
GDTC 510 Teaching Language Arts New	X	X	X	X	X	X	X	X	X	
GDTC 511 Teaching Mathematics New	X	X	X	X	X		X	X	X	
GDTC 512 Teaching in Early Childhood/Kindergarten New	X	X	X	X	X		X	X	X	
GDTC 513 Teaching Across the Curriculum New	X	X	X	X	X		X	X	X	
GDTC 520 Second	X	X	X	X	X	X	X	X	X	

Language Acquisition New										
GDTC 521 Teaching Second Language Pronunciation New	X	X	X	X	X		X	X	X	
GDTC 522 Teaching Second Language Vocabulary New	X	X	X	X	X		X	X	X	
GDTC 523 Teaching Second Language Grammar New	X	X	X	X	X		X	X	X	

Defined Group Changes:

Defined Groups

	Defined Group Title Change	Defined Group Requirements Change	Change to Total Credit Value of Defined Group
Preschool and Elementary Teaching Cluster New	X	X	
Second Language Teaching Cluster New	X	X	

Regulation Changes:

- Admission Requirements Change
- Academic Regulations Change

REGULATIONS CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: Admission Requirements

Calendar Section Type: Regulation

Description of Change: Admission Requirements Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Type of change: Regulation Change

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Arts and Science Programs > Education Programs > Graduate Diploma > Graduate Diploma in Teacher Certification

Present Text calendar

Admission Requirements

Proposed Text

Admission Requirements

- Bachelor's Degree. Applicants must have completed a high-standing bachelor's/baccalaureate (or equivalent). High standing is defined as honours, specialization, or a GPA equivalent to a B average.
- Teaching Experience. Applicants must have a minimum of five years of teaching contracts (full- or part-time). Applicants will be prioritized according to both their total number of hours accumulated and length of the contracts.
- Recommendation letter from a school principal or a service centre/school board.
- Letter of Tolerance. The Letter of Tolerance is issued from a School Board or Centre des Services Scolaires in Quebec or a teaching contract valid during the duration of the program.
- **Proficiency in English.** Applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the English language proficiency page for further information on requirements and exemptions.

Rationale:

The program addresses a specific niche in the market by targeting individuals with a minimum of five years of teaching experience and valid ongoing teaching contracts (e.g., letters of tolerance) in Quebec schools. This strategic focus allows the institution to tap into a new demographic without directly competing with existing programs.

By permitting uncertified teachers to continue teaching while undergoing valuable training, the program recognizes the value of candidates' work environments and contributes to the ongoing professionalization of their practice. This approach positions the program as relevant and responsive to uncertified educators' authentic needs and experiences.

Resource Implications:

n/a

PROGRAM CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: Graduate Diploma in Teacher Certification

Calendar Section Type: Program

Description of Change: Graduate Diploma in Teacher Certification
New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Program Name:

Program Type: Course-based

Degree: Course-based

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Arts and Science Programs > Education Programs > Graduate Diploma > Graduate Diploma in Teacher Certification > Degree Requirements

Type of Change: New Program

Present Text calendar

credits

0

Proposed Text

30

credits

Graduate Diploma in Teacher Certification

0

18 required credits:

GDTC 500 Introduction to the Program: The Teacher's
Bootcamp (1.5)

GDTC 501 The Teacher's Workshop I (1.5)

GDTC 502 The Teacher's Workshop II (1.5)

GDTC 503 Planning and Implementing Learning Situations
(3)

GDTC 504 Evaluation of and for Learning (3)

GDTC 505 Fostering Diversity in the Classroom (3)

GDTC 506 Inclusive Pedagogy (3)

GDTC 507 Portfolio Creation (1.5)

EDUC 200

English Exam for Teacher Certification (0.00)

12 credits chosen from one of the following:

Preschool and Elementary Teaching Cluster

Second Language Teaching Cluster

Rationale:

The program deliberately integrates a Work-Integrated Learning Design feature. This approach encourages reflection on theoretical concepts and enhances the practical applicability of the program. It fosters a dynamic learning experience where action research is applied to real classroom challenges and provides opportunities for growth and development. By permitting uncertified teachers to continue teaching while

undergoing valuable training, the program recognizes the value of candidates' work environments and contributes to the ongoing professionalization of their practice. This approach positions the program as relevant and responsive to uncertified educators' authentic needs and experiences.

Resource Implications:

Please see section 9. Resources and 10. Budget Estimate in the proposal for detailed resource implications.

The estimated budget for the proposed program is delineated in the summary budget table.

The program will offer the following number of course sections in each year which needs to be added to the Department's base section count:

1. Year 1 = 3.5 section for the first program cohort *
2. Year 2 = 12.5 sections (7.5 sections for the first program cohort plus 5 sections for the second cohort)
3. Year 3 = 13 sections (3 sections for the first program cohort, 5 sections for the second cohort, 5 sections for the third program cohort)
4. Year 4 = 10 sections (5 sections for the third program cohort, 5 section for the fourth cohort)
5. Year 5 = 10 sections (5 sections for the fourth program cohort, 5 sections for the fifth program cohort)

* The typical number of sections offered each year is 10. Because the first cohort will exceptionally start in the Winter, while all other cohorts will begin in the Fall, Year 1 sections are reduced, and Years 2 and 3 sections are higher. As of Year 4, the number of sections offered each year will be 10. (For course sequence refer to Appendix 13.)

DEFINED GROUP CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: Preschool and Elementary Teaching Cluster

Calendar Section Type: Defined group

Description of Change: Preschool and Elementary Teaching Cluster
New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Arts and Science Programs > Education Programs > Graduate Diploma > Graduate Diploma in Teacher Certification > Degree Requirements > Graduate Diploma in Teacher Certification

Type of Change: New Defined Group

Present Text calendar

Proposed Text

0

credits [Preschool and Elementary Teaching Cluster](#)
0 [GDTC 510 Teaching Language Arts \(3\)](#)
[GDTC 511 Teaching Mathematics \(3\)](#)
[GDTC 512 Teaching in Early
Childhood/Kindergarten \(3\)](#)
[GDTC 513 Teaching Across the Curriculum \(3\)](#)

Rationale:

The Preschool and Elementary Teaching cluster is designed for individuals currently teaching or interested in teaching young children, typically from preschool (Kindergarten) through elementary school.

Concordia University has a strong reputation and long history of successful teacher education programs, including the Bachelor of Arts in Early Childhood and Elementary Education (ECEE). The department has strong faculty expertise in teacher education, and a diverse group of educators committed to excellence in teaching, research and community service. They are well known for their strong research profiles that inform their teaching and afford graduate students the opportunity to work on cutting edge research. They are also passionate about teaching an essential missing component, an emerging area, or responding to cultural transformations that still need to be created within the current curriculum. Given that the new proposed program capitalizes on the expertise of teacher education scholars and faculty members, the Faculty of Arts and Science's Department of Education is the most appropriate unit to house the proposed program.

Resource Implications:

n/a

DEFINED GROUP CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: Second Language Teaching Cluster

Calendar Section Type: Defined group

Description of Change: Second Language Teaching Cluster New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Arts and Science Programs > Education Programs > Graduate Diploma > Graduate Diploma in Teacher Certification > Degree Requirements > Graduate Diploma in Teacher Certification

Type of Change: New Defined Group

Present Text calendar

Proposed Text

	credits	
0		Second Language Teaching Cluster
	0	GDTC 520 Second Language Acquisition (3)
		GDTC 521 Teaching Second Language Pronunciation (3)
		GDTC 522 Teaching Second Language Vocabulary (3)
		GDTC 523 Teaching Second Language Grammar (3)

Rationale:

The Second Language Teaching cluster is ideal for those currently teaching or interested in teaching second languages, such as English as a Second Language (ESL), French as a Second Language (FSL), or other foreign languages, at the elementary and secondary school levels.

Concordia University has a strong reputation and long history of successful teacher education programs, including the Bachelor of Arts in Early Childhood and Elementary Education (ECEE). The department has strong faculty expertise in teacher education, and a diverse group of educators committed to excellence in teaching, research and community service. They are well known for their strong research profiles that inform their teaching and afford graduate students the opportunity to work on cutting edge research. They are also passionate about teaching an essential missing component, an emerging area, or responding to cultural transformations that still need to be created within the current curriculum. Given that the new proposed program capitalizes on the expertise of teacher education scholars and faculty members, the Faculty of Arts and Science's Department of Education is the most appropriate unit to house the proposed program.

Resource Implications:

n/a

REGULATIONS CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: Academic Regulations

Calendar Section Type: Regulation

Description of Change: Academic Regulations Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Type of change: Regulation Change

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Arts and Science Programs > Education Programs > Graduate Diploma > Graduate Diploma in Teacher Certification

Present Text calendar

Academic Regulations

Proposed Text

Academic Regulations

- [Academic Standing](#). Please refer to the [Academic standing section of the Calendar](#) for a detailed review of the [Academic Regulations](#).

- [Time Limit](#). Please refer to the [Academic regulations page](#) for further details regarding the [Time limits](#).

Rationale:

The regulations included are the standard regulations for a Diploma. As confirmed by SGS, since the program's grading is based on a pass/fail basis, the typical graduation requirement was not included (i.e. Graduation Requirement. To graduate, students must have completed all course requirements with a cumulative GPA of at least 2.70.).

Resource Implications:

n/a

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 500

Calendar Section Type: Course

Description of Change: GDTC 500 Introduction to the Program: The Teacher's Bootcamp New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

GDTC 500 Introduction to the Program: The Teacher's Bootcamp (1.5 credits)

Prerequisites:

Prerequisites:

Description :

Description :

This seminar discusses the teaching profession in Quebec and covers topics such as ethics, professionalism, and the broader social and cultural contexts in which education operates as well as the structure of the program. Through this course, participants acquire the necessary information and tools to be successful in the program. They are introduced to critical inquiry, action research and reflection, how to apply interventions to their teaching practices and classrooms and start developing their professional portfolios.

Component(s):

Component(s):

Seminar

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : This course is graded on a pass/fail basis.

Rationale:

This foundational course sets the stage for the entire program, providing participants with a comprehensive overview. Addressing critical aspects such as growth mindset it equips educators with essential tools for success in the development of the competencies targeted by this program. This course emphasizes professionalism, action research, and reflection, which are the foundations of the program.

Resource Implications:

This course will require an additional 0.5 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 501

Calendar Section Type: Course

Description of Change: GDTC 501 The Teacher's Workshop I New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

GDTC 501 The Teacher's Workshop I (1.5 credits)

Prerequisites:

Prerequisites:

The following course must be completed previously: GDTC 500 .

Description :

Description :

This dynamic and interactive set of workshops support participants to identify and address aspects of the teaching profession that they wish to explore and address in further depth (i.e., classroom management, emotional regulation, teacher resilience, teacher and learner motivation). Throughout the course, participants are encouraged to reflect on their teaching methods and explore ways to expand the boundaries of their practice. Engaging in discussions with their peers and instructors, participants develop problem-solving and critical thinking skills required to tackle the challenges relevant to their individual practice.

Component(s):

Component(s):

Workshop

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : This course is graded on a pass/fail basis.

Rationale:

These dynamic workshops (GDTC 501 and 502) empower participants to navigate real-world teaching challenges. By fostering creative problem-solving and critical thinking skills, these sessions encourage participants to reflect on and improve their teaching practice. These workshops will also cultivate a supportive and collaborative community within the cohort and establish valuable social and professional networks.

Resource Implications:

This course will require an additional 0.5 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 502

Calendar Section Type: Course

Description of Change: GDTC 502 The Teacher's Workshop II New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

GDTC 502 The Teacher's Workshop II (1.5 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: GDTC 501 .

Description :

Description :

This set of workshops builds on GDTC 501 by delving more deeply into the challenges participants face in their teaching practice. The problem-solving and critical thinking skills targeted in GDTC 501 are applied to critically analyze research related to these challenges. Throughout the course, participants reflect on their teaching methods and implement evidence-based strategies.

Component(s):

Component(s):

Workshop

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : This course is graded on a pass/fail basis.

Rationale:

These dynamic workshops (GDTC 501 and 502) empower participants to navigate real-world teaching challenges. By fostering creative problem-solving and critical thinking skills, these sessions encourage participants to reflect on and improve their teaching practice. These workshops will also cultivate a supportive and collaborative community within the cohort and establish valuable social and professional networks.

Resource Implications:

This course will require an additional 0.5 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 503

Calendar Section Type: Course

Description of Change: GDTC 503 Planning and Implementing Learning Situations New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

GDTC 503 Planning and Implementing Learning Situations (3 credits)

Prerequisites:

Prerequisites:

The following course must be completed concurrently: GDTC 500 .

Description :

Description :

This course focuses on enhancing participants' skills and strategies in planning and implementing effective learning situations, by ensuring alignment between targeted competencies, learning objectives, and assessment plans. Participants plan and implement lessons relevant to their current teaching context. Motivation for learning, student diversity, and effective integration of digital technologies are explored as guiding principles in impactful learning.

Component(s):

Component(s):

Seminar

Notes :

Notes :

Other note :

Other note : It is strongly recommended that GDTC 510 or GDTC 520 be taken concurrently with this course.

Non-standard assessment note :

Non-standard assessment note : This course is graded on a pass/fail basis.

Rationale:

Planning and implementation are the foundations of effective teaching. Focused on enhancing teaching skills and strategies, this course provides participants with the tools to plan and implement effective learning situations.

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 504

Calendar Section Type: Course

Description of Change: GDTC 504 Evaluation of and for Learning
New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

GDTC 504 Evaluation of and for Learning (3 credits)

Prerequisites:

Prerequisites:

The following course must be completed previously: GDTC 503 .

Description :

Description :

This course builds on the planning skills targeted in GDTC 503 and focuses on assessment *for* learning and evaluation *of* learning. Participants implement strategies related to assessment *for* learning, such as involving students in the assessment processes, providing formative feedback, and supporting learners to be autonomous in the monitoring of their progress. In addition, participants put in practice evaluation *of* learning, such as gathering evidence for both detailed and holistic reports of student outcomes. Ultimately, participants develop skills to effectively implement assessment and evaluation techniques to support student learning and growth.

Component(s):

Component(s):

Seminar

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : This course is graded on a pass/fail basis.

Rationale:

Effective teaching depends on robust evaluation methods. This course is instrumental in enhancing teachers' assessment, evaluation, and feedback strategies and it equips educators to support student learning and growth. The emphasis on diverse evaluation methods aligns with modern educational needs.

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 505

Calendar Section Type: Course

Description of Change: GDTC 505 Fostering Diversity in the Classroom New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[GDTC 505 Fostering Diversity in the Classroom \(3 credits\)](#)

Prerequisites:

Prerequisites:

The following course must be completed previously: [GDTC 500](#) .

Description :

Description :

This course focuses on the importance of building classroom climates that respect and value diversity. Participants explore practices that celebrate the unique lives and contributions of each student, build trusting relationships, and address discrimination. Participants consider how technology, motivation, and classroom rules and routines can champion diversity within the classroom.

Component(s):

Component(s):

[Seminar](#)

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : [This course is graded on a pass/fail basis.](#)

Rationale:

Today's classrooms require teachers to be able to create inclusive and culturally responsive environments. This course will support participants in fostering an equitable and inclusive classroom experience, celebrating student diversity.

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 506

Calendar Section Type: Course

Description of Change: GDTC 506 Inclusive Pedagogy New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

GDTC 506 Inclusive Pedagogy (3 credits)

Prerequisites:

Prerequisites:

The following course must be completed previously: GDTC 500 .

Description :

Description :

This course is designed to equip participants with the knowledge, skills, and strategies necessary to create inclusive classrooms where children with special needs receive the support and accommodations they need to thrive. Participants implement intervention or learning support plans, striking a balance between personalized interventions and interventions for the entire class. Participants leverage the knowledge and skills that ensure that all students, regardless of their exceptionalities, can succeed in an inclusive classroom setting.

Component(s):

Component(s):

Seminar

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : This course is graded on a pass/fail basis.

Rationale:

Designed to create inclusive classrooms, this course ensures that participants acquire the knowledge and skills necessary to support students with special needs. The focus on exceptionalities aims to create an environment where all students can thrive, promoting inclusivity in education.

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 507

Calendar Section Type: Course

Description of Change: GDTC 507 Portfolio Creation New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[GDTC 507 Portfolio Creation \(1.5 credits\)](#)

Prerequisites:

Prerequisites:

The following courses must be completed previously: [GDTC 505](#). Students must have completed 15 credits prior to enrolling.

Description :

Description :

This final intensive seminar is the culmination of the diploma. Participants are guided in showcasing the knowledge and skills accumulated throughout the courses. Participants demonstrate their ability to act as knowledge facilitators, manage class operations, take into account student diversity, and use digital technologies effectively. This course includes the creation of a professional portfolio, aligning with the commitment to professional development and ethical principles.

Component(s):

Component(s):

[Seminar](#)

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : [This course is graded on a pass/fail basis.](#)

Rationale:

The culmination of the program, this intensive seminar prepares participants for the dynamic field of education. By demonstrating their development of the professional competencies, participants showcase their readiness for the challenges of the profession. The creation of a professional portfolio aligns with the commitment to ongoing professional development and ethical principles.

Resource Implications:

This course will require an additional 0.5 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 510

Calendar Section Type: Course

Description of Change: GDTC 510 Teaching Language Arts New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

GDTC 510 Teaching Language Arts (3 credits)

Prerequisites:

Prerequisites:

The following course must be completed concurrently: GDTC 500 .

Description :

Description :

This course enables participants to acquire the necessary skills for developing a stimulating and effective language arts program for kindergarten and elementary grades. Current theories of literacy development and implications for planning and instruction are addressed. The course focuses on listening, speaking, reading, and writing, emphasizing the integration of language arts activities into other subject areas.

Component(s):

Component(s):

Seminar

Notes :

Notes :

Other note :

Other note : It is strongly recommended that GDTC 503 be taken concurrently with this course.

Non-standard assessment note :

Non-standard assessment note : This course is graded on a pass/fail basis.

Rationale:

This course is essential for equipping participants with the skills to develop an effective language arts program. The content and focus of this course will be anchored in the language arts competencies reflected in the Quebec Education Program (QEP).

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 511

Calendar Section Type: Course

Description of Change: GDTC 511 Teaching Mathematics New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[GDTC 511 Teaching Mathematics](#) (3 credits)

Prerequisites:

Prerequisites:

The following course must be completed previously: [GDTC 500](#) .

Description :

Description :

This course introduces a conceptual analysis of school mathematics and its application to the early childhood and elementary classroom. Topics include numeracy acquisition, counting, whole number operations, and problem solving. Emphasis is placed on the development of children's thinking and pedagogical practices aimed at assisting students to think mathematically.

Component(s):

Component(s):

[Seminar](#)

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : [This course is graded on a pass/fail basis.](#)

Rationale:

This course is essential for equipping participants with the skills to develop an effective mathematics program. The content and focus of this course will be anchored in the mathematics competencies reflected in the Quebec Education Program (QEP).

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 512

Calendar Section Type: Course

Description of Change: GDTC 512 Teaching in Early Childhood/Kindergarten New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Prerequisites:

Description :

Component(s):

Notes :

Non-standard assessment note :

Rationale:

This course addresses theoretical and applied aspects of early childhood education, preparing educators to meet the unique needs of young children. Emphasizing play-based curriculum and effective learning environments ensures a holistic approach to early childhood education. The content and focus of this course will be anchored in the preschool competencies reflected in the Quebec Education Program (QEP).

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

Proposed Text

[GDTC 512 Teaching in Early Childhood/Kindergarten](#) (3 credits)

Prerequisites:

The following course must be completed previously: [GDTC 500](#) .

Description :

This course addresses theoretical and applied aspects of early childhood education, including the educational and developmental needs of young children, models of education, the role of the teacher, play-based curriculum and instruction, health and safety issues, and the design of effective kindergarten learning environments.

Component(s):

[Seminar](#)

Notes :

Non-standard assessment note : [This course is graded on a pass/fail basis.](#)

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 513

Calendar Section Type: Course

Description of Change: GDTC 513 Teaching Across the Curriculum
New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[GDTC 513 Teaching Across the Curriculum](#) (3 credits)

Prerequisites:

Prerequisites:

The following courses must be completed previously: [GDTC 511](#) .

Description :

Description :

This course supports participants in planning cross-curricular lessons or units of instruction that incorporate multiple subject areas. The course highlights the importance of asking essential questions that allow students in elementary grades to engage with curricular content in meaningful and relevant ways.

Component(s):

Component(s):

[Seminar](#)

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : This course is graded on a pass/fail basis.

Rationale:

Supporting participants in planning cross-curricular lessons and units, this course highlights the importance of meaningful and relevant engagement with curricular content in elementary grades.

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 520

Calendar Section Type: Course

Description of Change: GDTC 520 Second Language Acquisition
New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Prerequisites:

Description :

Component(s):

Notes :

Other note :

Non-standard assessment note :

Rationale:

In order to better facilitate language learning the participants require knowledge of how languages are acquired. Exploring theoretical and practical aspects of second language acquisition, this course prepares educators to create supportive and inclusive environments for language learners. The integration of research-based insights guides effective teaching strategies.

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

Proposed Text

GDTC 520 Second Language Acquisition (3 credits)

Prerequisites:

The following course must be completed concurrently: GDTC 500 .

Description :

This course explores the theoretical and practical aspects of second language acquisition (SLA). Participants explore the key principles and methodologies involved in acquiring a second language, with a focus on effective teaching strategies for language learners. Topics include the role of input, interaction, and feedback in language acquisition, as well as the influence of cultural and social factors. Emphasis is placed on fostering a supportive and inclusive learning environment for young learners developing proficiency in a second language. The course integrates research-based insights to guide educators in designing effective language acquisition activities.

Component(s):

Seminar

Notes :

Other note : It is strongly recommended that GDTC 503 be taken concurrently with this course.

Non-standard assessment note : This course is graded on a pass/fail basis.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 521

Calendar Section Type: Course

Description of Change: GDTC 521 Teaching Second Language
Pronunciation New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[GDTC 521 Teaching Second Language Pronunciation \(3 credits\)](#)

Prerequisites:

Prerequisites:

The following course must be completed previously: [GDTC 520](#) .

Description :

Description :

This course is designed to equip educators with the knowledge and skills necessary for effective instruction in second language pronunciation. Participants explore theories and practices related to teaching phonetics, intonation, and articulation to young language learners. The curriculum emphasizes practical strategies for addressing common pronunciation challenges, incorporating technology-enhanced learning tools. The course integrates research-driven insights to guide them in improving pronunciation skills when working with young language learners.

Component(s):

Component(s):

[Seminar](#)

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : [This course is graded on a pass/fail basis.](#)

Rationale:

Second Language Teaching Cluster is structured around three major SLA areas (pronunciation, grammar, and vocabulary) to help participants finetune language learning implementations. Equipping participants with knowledge and skills for effective pronunciation instruction, this course addresses common challenges with practical strategies. The teaching of pronunciation will be anchored in the three English as a Second Language competencies in the Quebec Education Program while emphasizing ESL Competency #1: Oral Interaction.

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 522

Calendar Section Type: Course

Description of Change: GDTC 522 Teaching Second Language Vocabulary New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[GDTC 522 Teaching Second Language Vocabulary \(3 credits\)](#)

Prerequisites:

Prerequisites:

The following course must be completed previously: [GDTC 520](#) .

Description :

Description :

In this course, participants explore effective strategies for teaching and expanding vocabulary in the context of second language acquisition for young learners. Participants examine theoretical foundations of vocabulary development. Emphasis is placed on practical methodologies for designing interactive vocabulary activities, incorporating context-based learning, and leveraging technology to enhance vocabulary acquisition. The course aims to foster a rich and diverse lexical repertoire among young second language learners.

Component(s):

Component(s):

Seminar

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : This course is graded on a pass/fail basis.

Rationale:

Second Language Teaching Cluster is structured around three major SLA areas (pronunciation, grammar, and vocabulary) to help participants finetune language learning implementations. This course explores effective strategies for teaching vocabulary in second language acquisition, fostering a rich and diverse lexical repertoire. The emphasis on context-based learning and technology integration aligns with modern language teaching approaches. The teaching of vocabulary will be anchored through the lenses of the three English as a Second Language competencies in the Quebec Education Program.

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: New Graduate Diploma in Teacher Certification (GDTC)

Calendar Section Name: GDTC 523

Calendar Section Type: Course

Description of Change: GDTC 523 Teaching Second Language Grammar New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Arts and Science

Department: Education

Calendar publication date: 2024/2025/Winter

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Jan 0001

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Arts and Science Courses > Education Courses > Graduate Diploma in Teacher Certification Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[GDTC 523 Teaching Second Language Grammar \(3 credits\)](#)

Prerequisites:

Prerequisites:

The following course must be completed previously: [GDTC 520](#) .

Description :

Description :

This course is designed to help participants explore contemporary theories and research on grammar acquisition, with a focus on practical strategies for interactive and communicative approaches to grammar instruction. The curriculum covers essential aspects such as syntax, morphology, and sentence structure, addressing common challenges faced by young language learners. Participants develop the skills necessary to guide second language learners in enhancing grammatical awareness and proficiency .

Component(s):

Component(s):

Seminar

Notes :

Notes :

Non-standard assessment note :

Non-standard assessment note : This course is graded on a pass/fail basis.

Rationale:

Second Language Teaching Cluster is structured around three major SLA areas (pronunciation, grammar, and vocabulary) to help participants finetune language learning implementations. Designed to explore contemporary theories and research on grammar acquisition, this course equips participants with practical strategies for interactive and communicative approaches to grammar instruction. The focus on syntax, morphology, and sentence structure addresses common challenges faced by language learners. The teaching of grammar will be anchored through the lenses of the three English as a Second Language competencies in the Quebec Education Program.

Resource Implications:

This course will require an additional 1.0 sections to be added to the Department's base section count.

Impact Report

Defined Groups

Preschool and Elementary Teaching Cluster New

Graduate -> See Summer 2024 Graduate Calendar -> Programs -> Arts and Science Programs -> Education Programs -> Graduate Diploma -> Graduate Diploma in Teacher Certification -> Degree Requirements -> Graduate Diploma in Teacher Certification
Source of Impact

Second Language Teaching Cluster New

Graduate -> See Summer 2024 Graduate Calendar -> Programs -> Arts and Science Programs -> Education Programs -> Graduate Diploma -> Graduate Diploma in Teacher Certification -> Degree Requirements -> Graduate Diploma in Teacher Certification
Source of Impact

Courses

GDTC 500 Introduction to the Program: The Teacher's Bootcamp New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses
Source of Impact

GDTC 501 The Teacher's Workshop I New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses
Source of Impact

GDTC 502 The Teacher's Workshop II New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses
Source of Impact

GDTC 503 Planning and Implementing Learning Situations New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses
Source of Impact

GDTC 504 Evaluation of and for Learning New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses
Source of Impact

GDTC 505 Fostering Diversity in the Classroom New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses
Source of Impact

GDTC 506 Inclusive Pedagogy New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses
Source of Impact

GDTC 507 Portfolio Creation New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses

Source of Impact

GDTC 510 Teaching Language Arts New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses

Source of Impact

GDTC 511 Teaching Mathematics New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses

Source of Impact

GDTC 512 Teaching in Early Childhood/Kindergarten New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses

Source of Impact

GDTC 513 Teaching Across the Curriculum New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses

Source of Impact

GDTC 520 Second Language Acquisition New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses

Source of Impact

GDTC 521 Teaching Second Language Pronunciation New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses

Source of Impact

GDTC 522 Teaching Second Language Vocabulary New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses

Source of Impact

GDTC 523 Teaching Second Language Grammar New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Arts and Science Courses -> Education Courses -> Graduate Diploma in Teacher Certification Courses

Source of Impact

Other Units

Addition of **Academic regulations** to **Academic Regulations** requirement

Source of other unit Impact

- Sub Section is housed in Academic regulations

Addition of **Time Limits** to **Academic Regulations** requirement

Source of other unit Impact

- Regulation is housed in Academic regulations

Addition of **Academic standing** to **Academic Regulations** requirement

Source of other unit Impact

- Regulation is housed in Academic regulations

Addition of EDUC 200 to Graduate Diploma in Teacher Certification requirement

Source of other unit Impact

- Course is housed in Section 31.090 Department of Education

Appendix 3

Course Outlines and Descriptions

Course Outline Sample

GDTC 500: Introduction to the program – The Teacher’s Bootcamp, 1.5 credits

Prerequisite(s)

None

Description

This seminar discusses the teaching profession in Québec and covers topics such as ethics, professionalism, and the broader social and cultural contexts in which education operates as well as the structure of the program. Through this course, participants acquire the necessary information and tools to be successful in the program. They are introduced to critical inquiry, action research and reflection, how to apply interventions to their teaching practices and classrooms and start developing their professional portfolios.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Master the language of instruction	- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.
Commits to own professional development and to the profession	- Define the actions implemented during their teacher training that contributed to the valorization of the teaching profession. - Explain the evolution of their reflective stance since the beginning of their teacher training. - Determine the plan for continuing education to ensure greater mastery of their skills.
Acts in accordance with the ethical principles of the profession	- Document the major ethical issues of the teacher in terms of integrity in the performance of their duties. - Argue the changes integrated into their training concerning values and attitudes.

Assessments

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor’s feedback:

1. “Starting line”
 - a. Part 1: Description of personal understanding of the goals of the course

- b. Part 2: Brief presentation of teaching philosophy
2. Goal setting: identification of areas of where sense of self-efficacy is higher compared to others.
3. “Stolen goods”: Report on knowledge and skills gathered in the course.

Course Outline Sample

GDTC 501: The Teacher's Workshop I (1.5 credits)

Prerequisite(s)

GDTC 500

Description

This dynamic and interactive set of workshops support participants to identify and address aspects of the teaching profession that they wish to explore and address in further depth (i.e., classroom management, emotional regulation, teacher resilience, teacher and learner motivation). Throughout the course, participants are encouraged to reflect on their teaching methods and explore ways to expand the boundaries of their practice. Engaging in discussions with their peers and instructors, participants develop problem-solving and critical thinking skills required to tackle the challenges relevant to their individual practice.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Acts as a cultural (knowledge) facilitator when carrying out duties	- Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.
Masters the language of instruction	- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.
Commits to own professional development and to the profession	- Define the actions implemented during their teacher training that contributed to the valorization of the teaching profession. - Explain the evolution of their reflective stance since the beginning of their teacher training. - Identify the primary contributions of research data to the practices of teachers.
Acts in accordance with the ethical principles of the profession	- Explain the practices adopted in the classroom or with the community that promote the inclusion of students.

Assessments

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor's feedback:

1. "Starting line"
 - a. Part 1: Description of personal understanding of the goals of the course
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. "Stolen goods": Report on knowledge and skills gathered in the course.

Course Outline Sample

GDTC 502: The Teacher's Workshop II (1.5 credits)

Prerequisite(s)

GDTC501

Description

This set of workshops builds on GDTC 501 by delving more deeply into the challenges participants face in their teaching practice. The problem-solving and critical thinking skills targeted in GDTC 501 are applied to critically analyze research related to these challenges. Throughout the course, participants reflect on their teaching methods and implement evidence-based strategies.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Acts as a cultural (knowledge) facilitator when carrying out duties	- Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.
Masters the language of instruction	- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.
Commits to own professional development and to the profession	- Define the actions implemented during their teacher training that contributed to the valorization of the teaching profession. - Explain the evolution of their reflective stance since the beginning of their teacher training. - Identify the primary contributions of research data to the practices of teachers.
Acts in accordance with the ethical principles of the profession	- Explain the practices adopted in the classroom or with the community that promote the inclusion of students.

Assessments

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor's feedback:

1. "Starting line"
 - a. Part 1: Description of personal understanding of the goals of the course
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. "Stolen goods": Report on knowledge and skills gathered in the course.

Course Outline Sample

GDTC 503: Planning and Implementing Teaching Learning Situations, 3 credits

Prerequisite(s)

GDTC 500

Description

This course focuses on enhancing participants' skills and strategies in planning and implementing effective learning situations, by ensuring alignment between targeted competencies, learning objectives, and assessment plans. Participants plan and implement lessons relevant to their current teaching context. Motivation for learning, student diversity, and effective integration of digital technologies are explored as guiding principles in impactful learning.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Act as a cultural facilitator when carrying out duties	<ul style="list-style-type: none">- Build teaching and learning situations that are organized coherently and meaningfully in accordance with the Québec school program, including cultural reference points.
Master the language of instruction	<ul style="list-style-type: none">- Adjust their language register based on the interlocutor and the communication intention.
Plan teaching and learning situations	<ul style="list-style-type: none">- Develop sequences and teaching and learning situations that take into account the logic of the curriculum, students' prior knowledge, and their preconceptions, with a perspective of planning short-term, medium-term, and long-term learning.- Integrate activities into teaching and learning situations that support the transferability of learning.
Implement teaching and learning situations	<ul style="list-style-type: none">- Implement teaching and learning situations that clarify the intended learning outcomes, verify students' preconceptions, draw on their prior knowledge, and align with a logic of continuity in learning.
Manage how the class operates	<ul style="list-style-type: none">- Organize the functioning of the class group in a way that allows students to continue their development in terms of learning and social and relational skills.- Ensure effective management of the time allocated for teaching and learning, as well as the organization of space and materials.- Regulate disruptive behaviors in the conduct of teaching and learning situations.
Support students' love of learning	<ul style="list-style-type: none">- Build teaching and learning situations explicitly anchored in the students' fields of interest.

Mobilize digital technologies	- Integrate technological tools or digital platforms based on the purposes of teaching and learning situations to support student learning.
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Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant’s current practices in planning and implementation. In coordination with the instructor, they will design goals to improve their planning and implementation current practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the “start-line”, the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor’s feedback

1. “Starting line”
 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Description and analysis of current practices in planning and implementation of learning paths.
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 504: Evaluation of and for Learning, 3 credits

Prerequisite(s)

GDTC 503

Description

This course builds on the planning skills targeted in GDTC 503 and focuses on Assessment for learning and evaluation of learning. Participants implement strategies related to Assessment for learning, such as involving students in the assessment processes, providing formative feedback, and supporting learners to be autonomous in the monitoring of their progress. In addition, participants put in practice Evaluation of Learning, such as gathering evidence for both detailed and holistic reports of student outcomes. Ultimately, participants develop skills to effectively implement assessment and evaluation techniques to support student learning and growth.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Masters the language of instruction	<ul style="list-style-type: none">- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.
Evaluates learning	<ul style="list-style-type: none">- Design learning assessment tools rooted in the curriculum and taking into account the characteristics and needs of students.- Explicitly state the purposes of learning assessment to question their teaching planning and, if necessary, modify it accordingly.- Compare the effectiveness of a variety of means for collecting meaningful and relevant data in assessing students' learning.- Explain the foundations of their decisions in evaluative judgments regarding students' learning, especially their progress.- Communicate assessment results, emphasizing students' strengths and challenges, and considering the emotional dimension of assessment.- Regularly provide feedback to students with the aim of supporting their learning, progress, and engagement.
Mobilizes digital technologies	<ul style="list-style-type: none">- Utilize digital technology as a means of inclusion and to address diverse needs.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current practices in learning assessment. In coordination with the instructor, they will design goals to improve their assessment current practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak

achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the “starting line”, the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor’s feedback:

1. “Starting line”
 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Description and analysis of current practices in planning and implementation of learning paths.
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 505: Fostering Diversity in the Classroom, 3 credits

Prerequisite(s)

GDTC 500

Description

This course focuses on the importance of building classroom climates that respect and value diversity. Participants explore practices that celebrate the unique lives and contributions of each student, build trusting relationships, and address discrimination. Participants consider how technology, motivation, and classroom rules and routines can champion diversity within the classroom.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Act as a cultural facilitator when carrying out duties	<ul style="list-style-type: none">- Act as a mediator between the students' culture, their cultural reference points, the school culture, and disciplinary content.- Situate students' learning in a cultural context that connects the past, present, and future.
Masters the language of instruction	<ul style="list-style-type: none">- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.- Incorporate a diversity of expression forms in teaching and learning situations, both orally and in writing, to support learning.
Manage how the class operates	<ul style="list-style-type: none">- Establish a safe and respectful climate with students that fosters the development of living together in diversity.- Create an environment that supports students' empowerment and progressive autonomy.
Take into account student diversity	<ul style="list-style-type: none">- Implement interventions that consider the issues related to inclusive education and cooperative strategies that take into account the diversity of students.
Support students' love of learning	<ul style="list-style-type: none">- Cultivate positive relationships with students to create optimal conditions for learning.
Mobilizes digital technologies	<ul style="list-style-type: none">- Utilize digital technology as a means of inclusion and to address diverse needs.
Act in accordance with the ethical principles of the profession	<ul style="list-style-type: none">- Adopt inclusive practices to prevent any form of discrimination against students.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current practices in fostering diversity. In coordination with the instructor, they will design goals to improve their practices. A cycle of

action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the “start-line”, the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor’s feedback:

1. “Starting line”
 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Description and analysis of current practices in planning and implementation of learning paths.
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 506: Inclusive Pedagogy. 3 credits

Prerequisite(s)

GDTC 500

Description

This course is designed to equip participants with the knowledge, skills, and strategies necessary to create inclusive classrooms where children with special needs receive the support and accommodations they need to thrive. Participants implement intervention or learning support plans, striking a balance between personalized interventions and interventions for the entire class. Participants leverage the knowledge and skills that ensure that all students, regardless of their exceptionalities, can succeed in an inclusive classroom setting.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Masters the language of instruction	<ul style="list-style-type: none">- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.
Manage how the class operates	<ul style="list-style-type: none">- Implement appropriate interventions based on the observation of signs of demotivation and misunderstanding.
Take into account student diversity	<ul style="list-style-type: none">- Adapt teaching and learning situations based on the needs, abilities, and backgrounds of students.- Implement interventions that consider the issues related to inclusive education and cooperative strategies that take into account the diversity of students.- Prioritize grouping modalities that consider pedagogical intentions and the differentiated learning needs of students.- Strike a balance between personalized interventions and interventions for the entire class.- Establish complementary relationships with members of the school team.- Implement intervention plans or learning support plans in collaboration with other professionals.
Mobilizes digital technologies	<ul style="list-style-type: none">- Utilize digital technology as a means of inclusion and to address diverse needs.
Act in accordance with the ethical principles of the profession	<ul style="list-style-type: none">- Adopt inclusive practices to prevent any form of discrimination against students.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current practices in inclusive education. In coordination with the instructor, they will design goals to improve their inclusive practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the "start-line", the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor's feedback:

1. "Starting line"
 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Description and analysis of current practices in planning and implementation of learning paths.
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 507: Portfolio Creation. 1.5 credits

Prerequisite(s)

GDTC 505, and 15 completed credits

Description

This final intensive seminar is the culmination of the diploma. Participants are guided in showcasing the knowledge and skills accumulated throughout the courses. Participants demonstrate their ability to act as knowledge facilitators, manage class operations, take into account student diversity, and use digital technologies effectively. This course includes the creation of a professional portfolio, aligning with the commitment to professional development and ethical principles.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Masters the language of instruction	- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.
Commits to own professional development and to the profession	- Define the actions implemented during their teacher training that contributed to the valorization of the teaching profession. - Explain the evolution of their reflective stance since the beginning of their teacher training. - Determine the plan for continuing education to ensure greater mastery of their skills.
Acts in accordance with the ethical principles of the profession	- Document the major ethical issues of the teacher in terms of integrity in the performance of their duties. - Argue the changes integrated into their training concerning values and attitudes.

Assessments

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor's feedback:

1. "Starting line"
 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Preliminary skeleton of professional portfolio.
2. Goal setting: identification of purpose and anticipated strengths of ideated portfolio.
3. Portfolio "preliminary version"
4. Video presentation of portfolio
5. Peer-feedback on two peer's portfolios
6. Professional portfolio

The following criteria will be used in evaluating participant's work:

1. Depth of Reflection: The extent to which students critically engage with course content and apply insights to their professional growth.
2. Clarity and Precision in Language Mastery: Assessment of language proficiency through written assignments and oral presentations.
3. Quality of Analysis: Evaluation of the depth and clarity of peer's portfolio.
4. Quality of Portfolio: Evaluation of the value and clarity of the pieces of evidence to chronicle professional development.

Course Outline Sample

GDTC 510: Teaching Language Arts, 3 credits

Co-requisite(s)

GDTC 500

Description

This course enables participants to acquire the necessary skills for developing a stimulating and effective language arts program for kindergarten and elementary grades. Current theories of literacy development and implications for planning and instruction are addressed. The course focuses on listening, speaking, reading, and writing, emphasizing the integration of language arts activities into other subject areas.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Act as a cultural facilitator when carrying out duties	<ul style="list-style-type: none">- Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.
Masters the language of instruction	<ul style="list-style-type: none">- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.
Plan teaching and learning situations	<ul style="list-style-type: none">- Develop sequences and teaching and learning situations that take into account the logic of the curriculum, students' prior knowledge, and their preconceptions, with a perspective of planning short-term, medium-term, and long-term learning.- Ensure maximum alignment between the intention behind the training activity, teaching and learning situations, and assessment during and at the end of the activity.- Document pedagogical and didactic choices based on research findings.
Implement teaching and learning situations	<ul style="list-style-type: none">- Assess the coherence of the teaching and learning situations implemented in relation to the content and organization of the Québec school program.
Evaluate learning	<ul style="list-style-type: none">- Design learning assessment tools rooted in the curriculum and taking into account the characteristics and needs of students.- Explicitly state the purposes of learning assessment to question their teaching planning and, if necessary, modify it accordingly.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current practices in teaching language arts. In coordination with the instructor, they will design goals to improve their practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the "start-line", the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor's feedback:

1. "Starting line"
 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Description and analysis of current practices in planning and implementation of learning paths.
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 511: Teaching Mathematics, 3 credits

Pre-requisite(s)

GDTC 500

Description

This course introduces a conceptual analysis of school mathematics and its application to the early childhood and elementary classroom. Topics include numeracy acquisition, counting, whole number operations, and problem solving. Emphasis is placed on the development of children's thinking and pedagogical practices aimed at assisting students to think mathematically.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Act as a cultural facilitator when carrying out duties	<ul style="list-style-type: none">- Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.
Masters the language of instruction	<ul style="list-style-type: none">- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.
Plan teaching and learning situations	<ul style="list-style-type: none">- Develop sequences and teaching and learning situations that take into account the logic of the curriculum, students' prior knowledge, and their preconceptions, with a perspective of planning short-term, medium-term, and long-term learning.- Ensure maximum alignment between the intention behind the training activity, teaching and learning situations, and assessment during and at the end of the activity.- Document pedagogical and didactic choices based on research findings.
Implement teaching and learning situations	<ul style="list-style-type: none">- Assess the coherence of the teaching and learning situations implemented in relation to the content and organization of the Québec school program.
Evaluate learning	<ul style="list-style-type: none">- Design learning assessment tools rooted in the curriculum and taking into account the characteristics and needs of students.- Explicitly state the purposes of learning assessment to question their teaching planning and, if necessary, modify it accordingly.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current practices in mathematics. In coordination with the instructor, they will design goals to improve their practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the "start-line", the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

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 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Description and analysis of current practices in planning and implementation of learning paths.
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 512: Teaching in Early Childhood/Kindergarten, 3 credits

Pre-requisite(s)

GDTC 500

Description

This course addresses theoretical and applied aspects of early childhood education, including the educational and developmental needs of young children, models of education, the role of the teacher, play-based curriculum and instruction, health and safety issues, and the design of effective kindergarten learning environments.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Act as a cultural facilitator when carrying out duties	<ul style="list-style-type: none">- Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.
Masters the language of instruction	<ul style="list-style-type: none">- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.- Adjust their language register based on the interlocutor and the communication intention.- Incorporate a diversity of expression forms in teaching and learning situations, both orally and in writing, to support learning.
Plan teaching and learning situations	<ul style="list-style-type: none">- Integrate activities into teaching and learning situations that support the transferability of learning.
Implement teaching and learning situations	<ul style="list-style-type: none">- Assess the coherence of the teaching and learning situations implemented in relation to the content and organization of the Québec school program.- Explicitly outline the approaches and strategies that make tasks stimulating and diverse for students while fostering their autonomy and supporting their engagement.
Support students' love of learning	<ul style="list-style-type: none">- Give meaning and value to learning by establishing connections with everyday life situations and the cultural reference points of the student.- Cultivate positive relationships with students to create optimal conditions for learning.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current practices in teaching in early childhood and/or kindergarten contexts. In coordination with the instructor, they will design goals to improve their practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the "start-line", the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor's feedback:

1. "Starting line"
 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Description and analysis of current practices in planning and implementation of learning paths.
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 513: Teaching Across the Curriculum, 3 credits

Pre-requisite(s)

GDTC 511

Description

This course supports participants in planning cross-curricular lessons or units of instruction that incorporate multiple subject areas authentically. The course highlights the importance of asking essential questions that allow students in elementary grades to engage with curricular content in meaningful and relevant ways.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Act as a cultural facilitator when carrying out duties	<ul style="list-style-type: none">- Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.
Masters the language of instruction	<ul style="list-style-type: none">- Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.
Plan teaching and learning situations	<ul style="list-style-type: none">- Develop sequences and teaching and learning situations that take into account the logic of the curriculum, students' prior knowledge, and their preconceptions, with a perspective of planning short-term, medium-term, and long-term learning.- Integrate activities into teaching and learning situations that support the transferability of learning.
Implement teaching and learning situations	<ul style="list-style-type: none">- Implement teaching and learning situations that clarify the intended learning outcomes, verify students' preconceptions, draw on their prior knowledge, and align with a logic of continuity in learning.- Assess the coherence of the teaching and learning situations implemented in relation to the content and organization of the Québec school program.
Support students' love of learning	<ul style="list-style-type: none">- Give meaning and value to learning by establishing connections with everyday life situations and the cultural reference points of the student.- Build teaching and learning situations explicitly anchored in the students' fields of interest.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current practices in teaching cross-curricular lessons and units. In coordination with the instructor, they will design goals to improve their practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the "start-line", the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor's feedback:

1. "Starting line"
 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Description and analysis of current practices in planning and implementation of learning paths.
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 520: Second Language Acquisition, 3 credits

Co-requisite(s)

GDTC 500

Description

This course explores the theoretical and practical aspects of second language acquisition (SLA). Participants will explore the key principles and methodologies involved in acquiring a second language, with a focus on effective teaching strategies for language learners. Topics include the role of input, interaction, and feedback in language acquisition, as well as the influence of cultural and social factors. Emphasis is placed on fostering a supportive and inclusive learning environment for young developing proficiency in a second language. The course integrates research-based insights to guide educators in designing effective language acquisition activities.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Act as a knowledge facilitator when carrying out duties	- Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.
Master the language of instruction	- Promote the language of instruction as a cultural object and a symbolic universe. - Master the language specifics inherent to their teaching discipline or disciplines.
Plan teaching and learning situations	- Document pedagogical and didactic choices based on research findings.
Evaluate learning	- Explain the foundations of their decisions in evaluative judgments regarding students' learning, especially their progress.
Take into account student diversity	- Adapt teaching and learning situations based on the needs, abilities, and backgrounds of students.
Mobilize digital technologies	- Utilize digital technology as a means of inclusion and to address diverse needs.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current understanding of language acquisition underneath their current language teaching practices. In coordination with the instructor, they will design goals to improve their practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the

course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the “starting line”, the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor’s feedback:

1. “Starting line”
 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Description and analysis of current language learning understandings supporting their language teaching practices.
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 521: Teaching Second Language Pronunciation, 3 credits

Prerequisite(s)

GDTC 520

Description

This course is designed to equip educators with the knowledge and skills necessary for effective instruction in second language pronunciation. Participants will explore theories and practices related to teaching phonetics, intonation, and articulation to young language learners. The curriculum emphasizes practical strategies for addressing common pronunciation challenges, incorporating technology-enhanced learning tools. The course integrates research-based insights to guide participants facilitate improved pronunciation proficiency among young language learners.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Act as a knowledge facilitator when carrying out duties	- Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.
Master the language of instruction	- Promote the language of instruction as a cultural object and a symbolic universe. - Master the language specifics inherent to their teaching discipline or disciplines.
Plan teaching and learning situations	- Document pedagogical and didactic choices based on research findings.
Evaluate learning	- Explain the foundations of their decisions in evaluative judgments regarding students' learning, especially their progress.
Take into account student diversity	- Adapt teaching and learning situations based on the needs, abilities, and backgrounds of students.
Mobilize digital technologies	- Utilize digital technology as a means of inclusion and to address diverse needs.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current understanding of pronunciation teaching practices. In coordination with the instructor, they will design goals to improve their practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the "start-

line”, the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

The following pieces will be submitted to show evidence of learning and gather instructor’s feedback:

1. “Starting line”
 - a. Part 1: Description of personal understanding of the goals of the course
 - b. Part 2: Description and analysis of current language learning understandings supporting their language teaching practices.
2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 522: Teaching Second Language Vocabulary, 3 credits

Prerequisite(s)

GDTC 520

Description

In this course, participants explore effective strategies for teaching and expanding vocabulary in the context of second language acquisition for young learners. Participants will examine theoretical foundations of vocabulary development. Emphasis is placed on practical methodologies for designing interactive vocabulary activities, incorporating context-based learning, and leveraging technology to enhance vocabulary acquisition. The course aims to foster a rich and diverse lexical repertoire among young second language learners.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Act as a knowledge facilitator when carrying out duties	- Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.
Master the language of instruction	- Spark interest in the language of instruction. - Master the language specifics inherent to their teaching discipline or disciplines.
Plan teaching and learning situations	- Integrate activities into teaching and learning situations that support the transferability of learning. - Document pedagogical and didactic choices based on research findings.
Implement teaching and learning situations	- Explicitly outline the approaches and strategies that make tasks stimulating and diverse for students while fostering their autonomy and supporting their engagement.
Evaluate learning	- Regularly provide feedback to students with the aim of supporting their learning, progress, and engagement.
Take into account student diversity	- Strike a balance between personalized interventions and interventions for the entire class.
Support students' love of learning	- Give meaning and value to learning by establishing connections with everyday life situations and the cultural reference points of the student.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current vocabulary teaching practices. In

coordination with the instructor, they will design goals to improve their practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the “starting line”, the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

Given the nature of the course goals, intricately linked to competencies, assessment for this course will be conducted holistically on a pass/fail basis. Participants will be evaluated based on their demonstrated ability to synthesize and apply the principles learned in authentic teaching and learning situations, ensuring that they can effectively implement the advanced pedagogical strategies covered in the course. This approach aligns with the holistic and practical nature of the competencies cultivated, providing a more accurate reflection of participants' readiness to excel in diverse educational settings.

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2. Goal setting: identification of areas of development and possible ways to provide pieces of evidence of improvement.
3. Action Research Plan
4. Report
5. Action Research Plan #2 (optional)
6. Report #2 (optional)
7. Self-reflection report

Course Outline Sample

GDTC 523: Teaching Second Language Grammar, 3 credits

Prerequisite(s)

GDTC 520

Description

This course is designed to help participants explore contemporary theories and research on grammar acquisition, with a focus on practical strategies for interactive and communicative approaches to grammar instruction. The curriculum covers essential aspects such as syntax, morphology, and sentence structure, addressing common challenges faced by young language learners. Participants will develop the skills necessary to guide second language learners in enhancing grammatical awareness and proficiency.

Learning outcomes

This course focuses on the development of the following Professional Competencies as outlined in the table below:

Competency	Learning outcomes
Act as a knowledge facilitator when carrying out duties	- Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.
Master the language of instruction	- Spark interest in the language of instruction. - Master the language specifics inherent to their teaching discipline or disciplines.
Plan teaching and learning situations	- Integrate activities into teaching and learning situations that support the transferability of learning. - Document pedagogical and didactic choices based on research findings.
Implement teaching and learning situations	- Explicitly outline the approaches and strategies that make tasks stimulating and diverse for students while fostering their autonomy and supporting their engagement.
Evaluate learning	- Regularly provide feedback to students with the aim of supporting their learning, progress, and engagement.
Take into account student diversity	- Strike a balance between personalized interventions and interventions for the entire class.
Support students' love of learning	- Give meaning and value to learning by establishing connections with everyday life situations and the cultural reference points of the student.
Mobilize digital technologies	- Utilize digital technology as a means of inclusion and to address diverse needs.

Assessments

The participants will start the course by describing their own understanding of course goals followed by a description and analysis of participant's current pedagogical grammar practices. In coordination with the instructor, they will design goals to improve their practices. A cycle of action research (identify challenges, plan actions, implement actions, reflect on results) will be carried out in the classroom where the participant teaches. Due to a weak achievement of the course goals, the course instructor can recommend a second action research cycle. At the end of the course, the participants will produce a report briefly presenting the "starting line", the action research plan(s) implemented, and the pieces of evidence that showcase the attainment of the goals of the course.

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7. Self-reflection report

Appendix 5

Needs Analysis, Surveys, Market Analysis, Environmental Scans



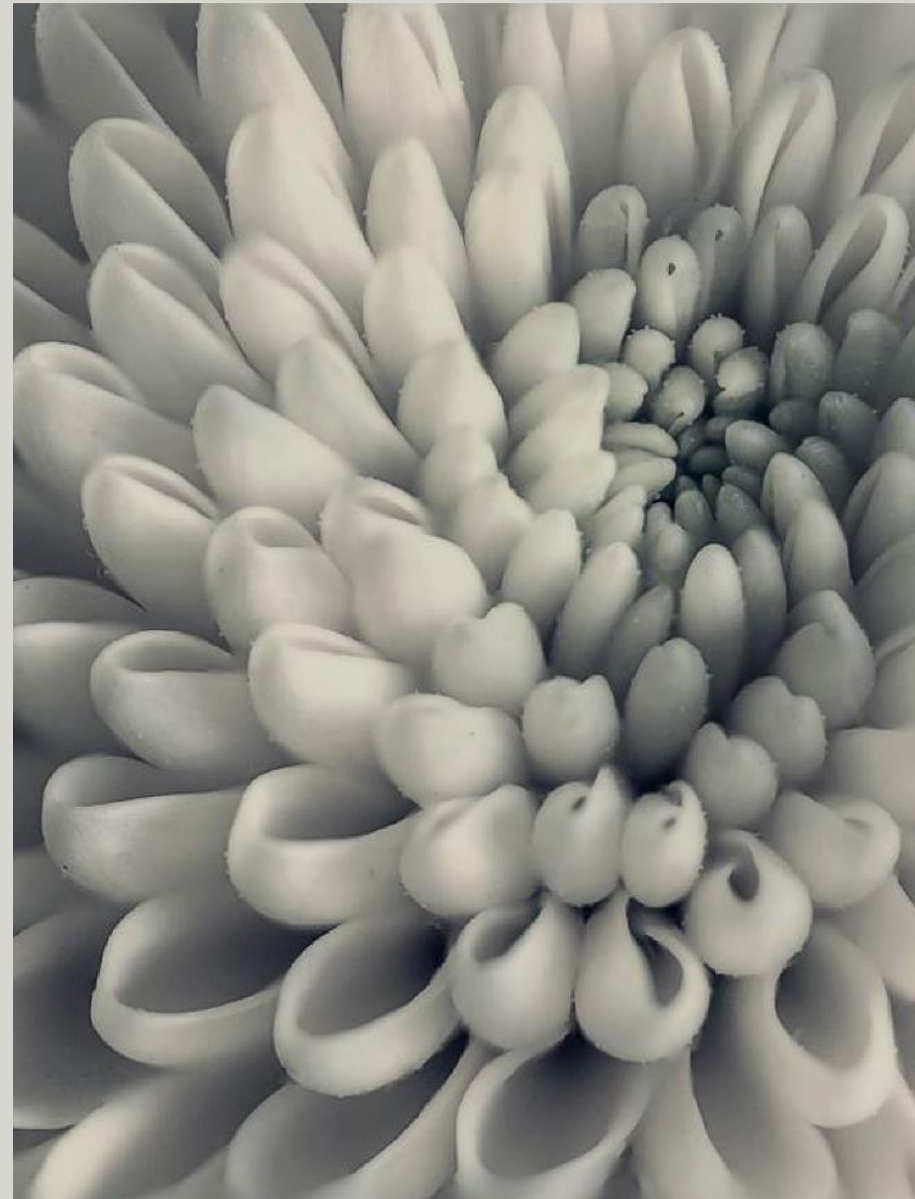
Uncertified Teachers in Quebec


Needs Assessment Report
2023-07-10



Introduction

- Needs Assessments
 1. School board consultations
 2. Teacher Survey and Interviews
- Results
 - Learner Profiles
 - Teachers' Wish List





Study One: Schoolboard Consultations

Consultation Structure

Internal Process	Demographics	Main Questions
<ul style="list-style-type: none"> • Target Population: <ul style="list-style-type: none"> ○ Administrators ○ Human resource professionals ○ Other roles responsible for the recruitment of teachers at Quebec Boards ○ Guiding question: How are Quebec school boards coping with a lack of certified teachers? • Also <ul style="list-style-type: none"> ○ Collect data on the lack of certified teachers from the employers' perspective: ○ Statistics on teachers issued letters of tolerance, process of issuing letters of tolerance ○ Challenges with staffing and approaches to filling the gaps of qualified teachers. • Sample selection process & size <ul style="list-style-type: none"> ○ based on available resources • Ran from February 23 to April 6, 2023 	<ul style="list-style-type: none"> • Assistant Director, Human Resources. Lester B. Pearson. • Coordinator, Teacher Recruitment and Retention Project. Quebec School Boards. • Assistant Director General, Eastern Townships School Board. 	<ul style="list-style-type: none"> • Describe the current staffing issues your schoolboard/school has been having with the teacher shortage. • What measures have you taken to fill teaching positions? • What are your general hiring requirements for teachers without certification? • What type of support measures have you put into place to support those teachers and your staff in general throughout this context? • What impact would a short certification program have on your board?



General Findings from Study 1: How are Quebec School Boards coping with the lack of Uncertified Teachers?

Creative Recruitment

Participate in international and national teacher-recruitment fairs

Call on the community for help

Rely on "Anyone with a pulse"

Teacher Professional Development

Provide in-house training

Provide support through the Teacher Induction Program (i.e., TIP: 2-year mentoring program)

Pairing with peer teacher support

Provide relief time to take short teacher certification programs

Provide additional support to take teacher certification programs in French



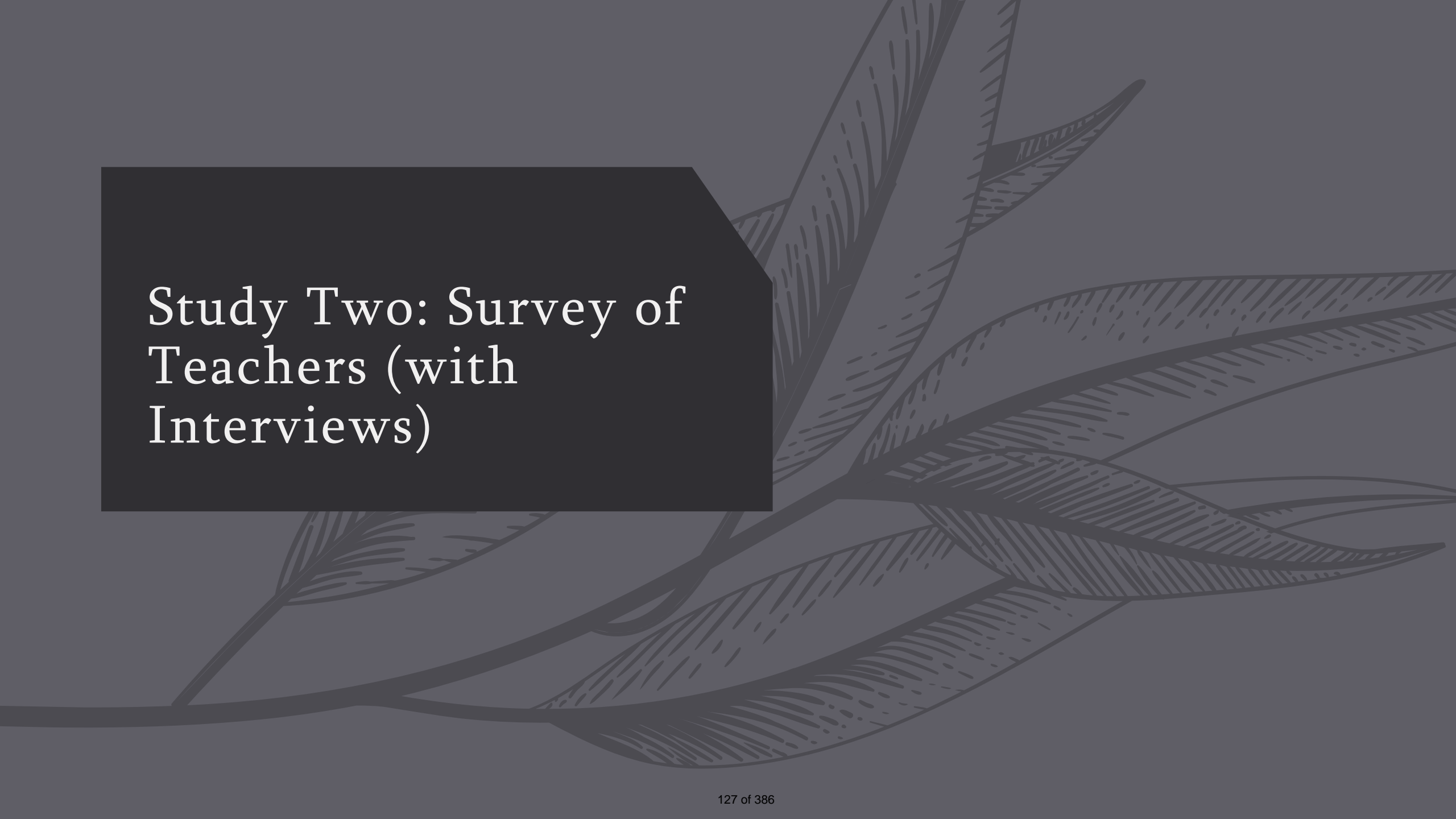
Benefits of a Certification Program Desired by Participants

Teachers

- Receive formal teacher education training
- Eliminate stigma of being "illegal"
- Obtain seniority and employment
- Relieve stress on insecure employment loop

Boards

- Retain good teachers
- Relieve pressure on staff
- Address the cultural piece of an English-language delivered program
- Do better for our children and our communities
- Partner with universities to feed the funnel of students into programs



Study Two: Survey of Teachers (with Interviews)

Survey Design and Data Collection Method

- **Target Population**
 - Teachers on letters of tolerance with a bachelor's degree and years of experience teaching in Quebec schools
- **Purpose** to collect essential data that provides a deeper understanding of the teachers' needs, preferences, challenges, and motivations.
- **Sample selection process** snowball method
- Online survey created in Microsoft Forms
- Ran from March 10 – June 9, 2023

Survey Structure

Demographics	Teaching Experience	General Feedback
<ul style="list-style-type: none">-School board-Type of appointment-Educational level	<ul style="list-style-type: none">-Years of Experience-Relevant training-Subject(s) taught-Primary or secondary school teacher	<p>Four main qualitative questions:</p> <ul style="list-style-type: none">-What are their views of/experience with acquiring a teacher certification degree?-What is the difference between certified and noncertified teachers?-What would make the certification process feasible for them?-General comments or recommendations



Follow up to Study Two: Teacher Interviews

Selection Criteria and Process (Interviews)

Selection Criteria

Note: Most respondents to the survey disclosed their contact information and agreed to meet with us.

1. Diversity of experience: educational background, years of experience, subject(s) taught
2. Representation from both elementary and secondary school teachers
3. Interviewees: 5 female teachers; 1 male teacher *

Process

- One-on-one interviews conducted between April 26 – May 11
- 6 Uncertified teachers on letters of tolerance
- Distributed interview questions via email in advance of each meeting
- 1 hour each conducted over Zoom
- Two interviewers took and compared notes
- Findings were used to create three learners' profiles

* According to Statistics Canada in 2011: 84% of all elementary school and kindergarten teachers are women. 59% of all secondary school teachers in Canada are women



Results

Participants

106 Respondents from Six School Boards

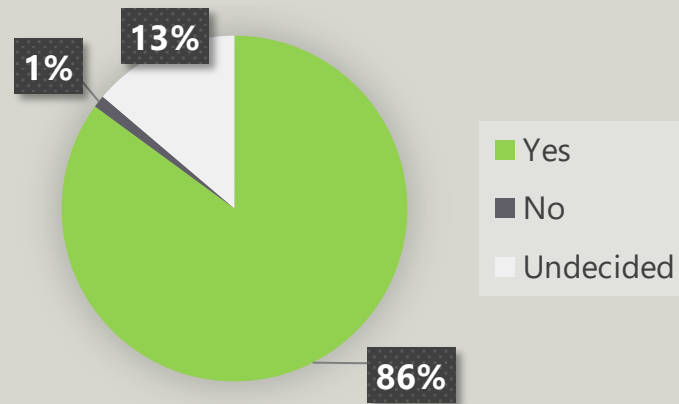
	Type of appointment	
35	• New Frontiers	
30	• Riverside	
16	• Sir Wilfrid Laurier	
9	• Western Quebec	
8	• Lester B. Pearson	
8	• Eastern Townships	
	Certified teacher	9
	Teacher on a letter of tolerance	76 (72%)
	Student teacher	2
	Substitute teacher	17
	Don't teach at all	2

Educational background	
PhD	2
Master's	16
Grad Dip	4
Bachelor's	37
High School/CEGEP	11
Enrolled in a bachelor's degree	6

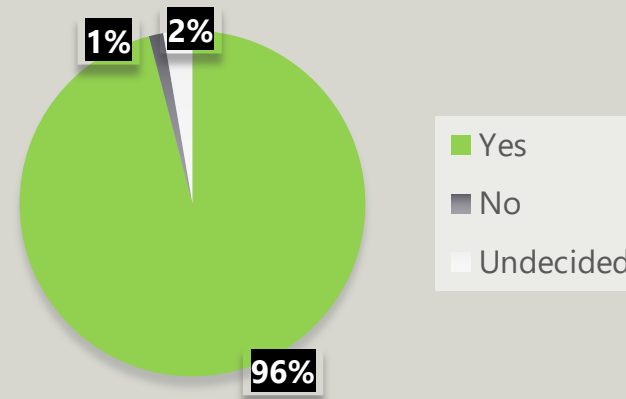
77%

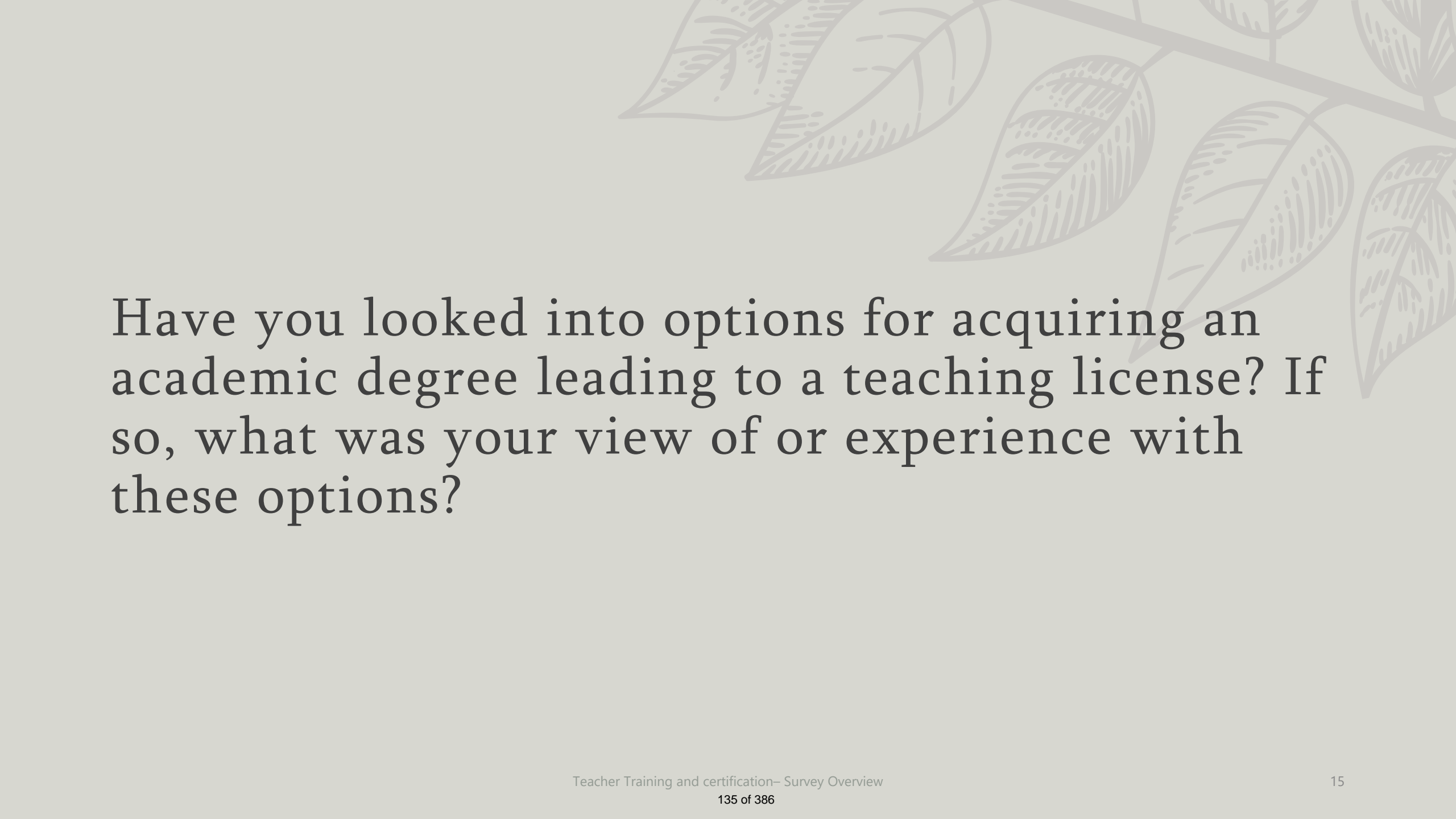
In Numbers

Would you be interested in acquiring a teaching license?



Would you be interested in completing an online, short-term teacher education program leading to the teaching license?



A decorative background featuring a branch with several leaves, rendered in a light gray, sketch-like style. The leaves are detailed with veins and are positioned in the upper right quadrant of the slide.

Have you looked into options for acquiring an academic degree leading to a teaching license? If so, what was your view of or experience with these options?

Challenges and Frustrations



Time

"The **time commitment** is hard with little opportunity to earn **income** through teaching."



Family Duties

"I have two **children** and cannot afford not to work for 4 years to obtain my license."



Content Relevance

"I feel that there are no formal program that recognizes my **experience** and matches my **learning needs**."



Lack of recognition of acquired competencies

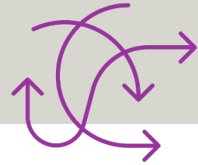
"Not interested in a full-time 4 or 2-year program. I already have **teaching experience**, a **BA** and **MA**."

Challenges and Frustrations (cont.)



Access/Mode of delivery

"I can only study if the courses are offered **online** in the **evening**."



Distance

"I'm in a period of my life where **relocating** for a program is not an option."



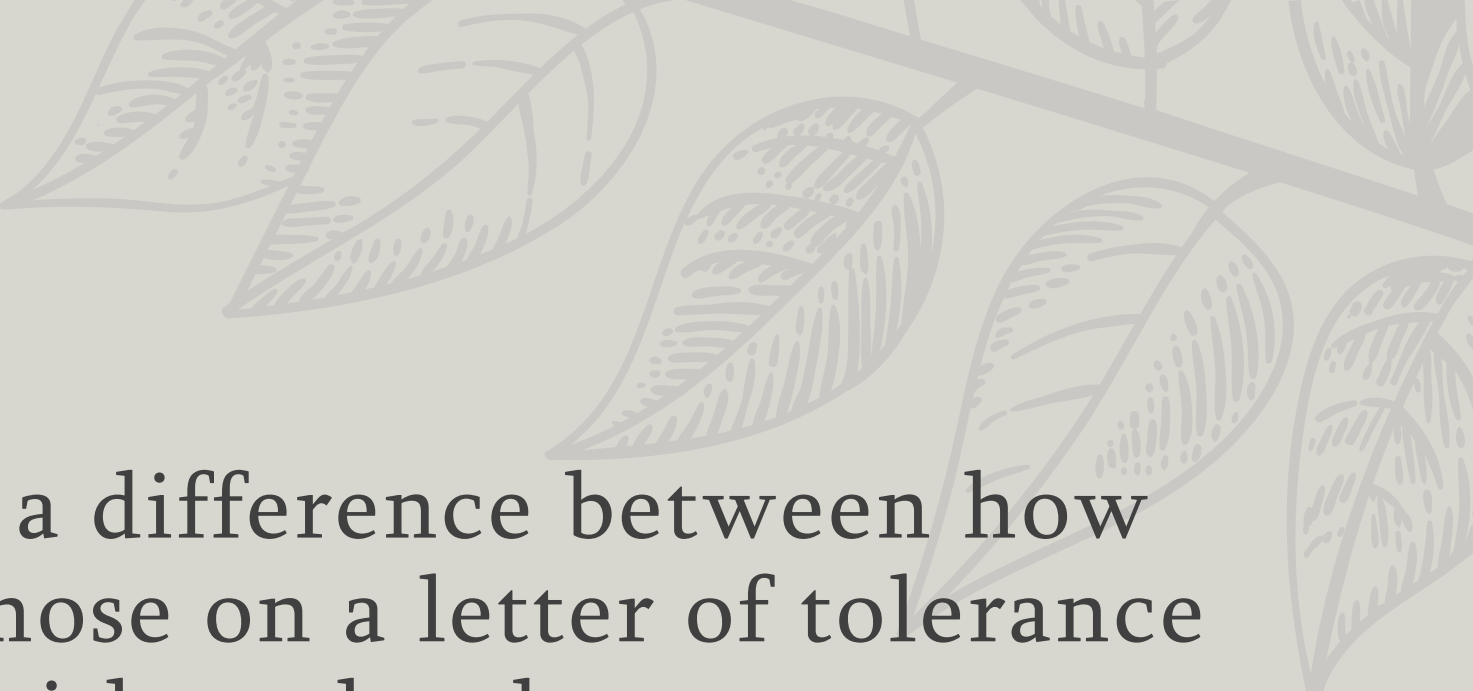
Financial Burden

"As a 3rd year teacher, my **salary** is difficult to survive on... investing in a teacher education program only further **drains** our individual **resources**."



Language

"As a person from a French speaking **remote** area it is very hard to obtain this type of certification in **English**."



Do you find there is a difference between how fully credentialed, those on a letter of tolerance and those teaching without legal status are treated?

Certified vs Noncertified Teachers



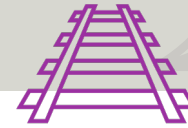
Job Security

"Job security is an issue. Having to call principals & schools each year. I have had full year contracts for the past 6 years and still have to wait to pick up what's left."



Salary + Choice of Courses

"There is a difference with the salary & choice of courses."
"Significantly lower pay for the same job."
"Certified teachers teach courses they studied, where I do not."



Tenure Track

"The possibility of having tenure is completely dependent on licensure, without it, there is no way to climb the seniority list."

Certified vs Noncertified Teachers (Cont.)



Stopgap solutions

"Teachers without full credentials are stopgap solutions to the shortage."




Stressful Summers

"There is never a guaranteed job for me the following academic year. I must wait until late August ... to hear whether there is a position available."



Just as good

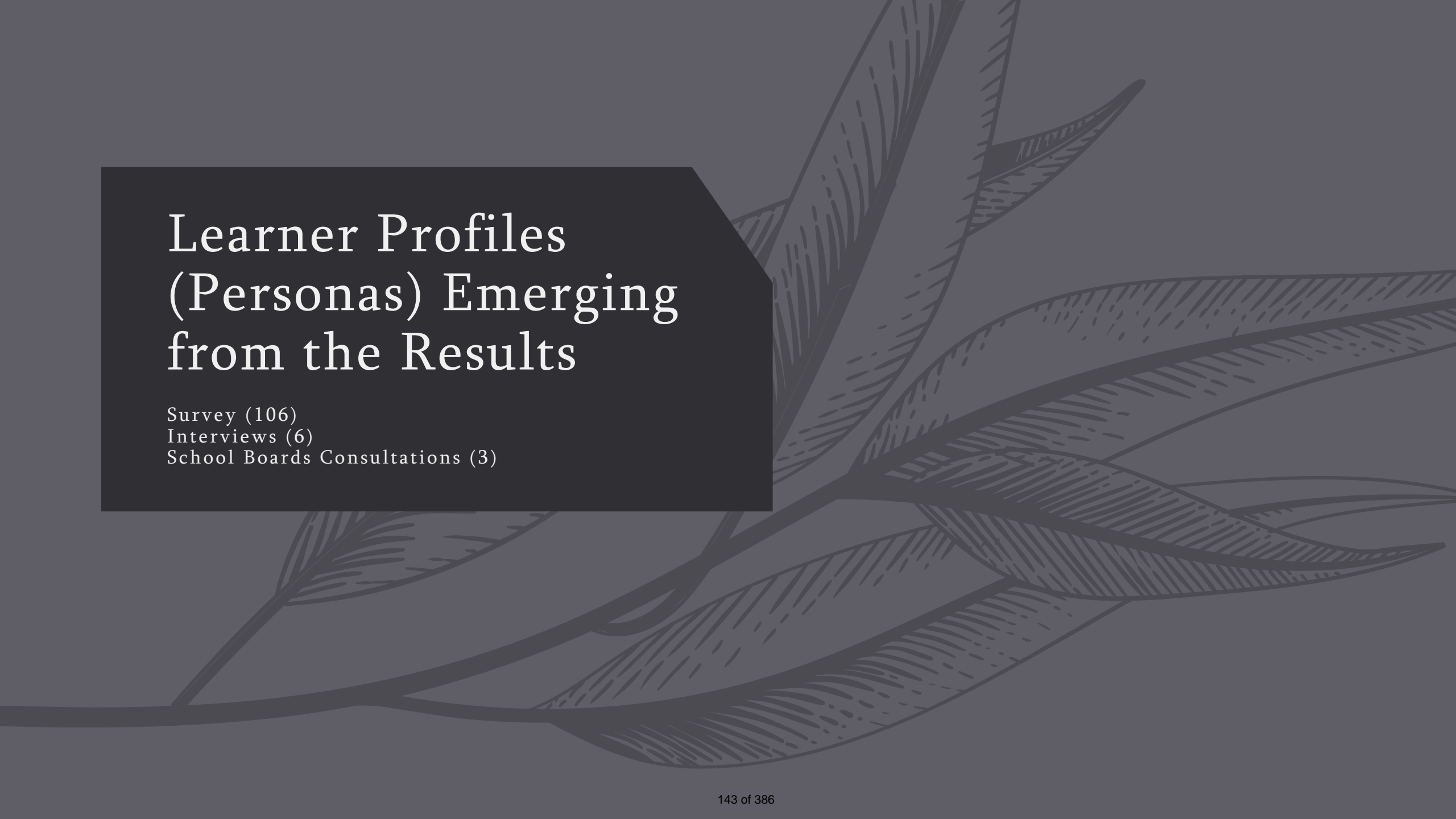
"I think I'm just as good (if not better) than the average teacher.
I love kids and have a knack for teaching."



What would you need in this program to make the process feasible for you?

Uncertified Teachers want Flexibility, Affordability and Accessibility

- ✓ **"Online."**
- ✓ *"Evening and weekend classes."*
- ✓ **"Short term."**
- ✓ **"Summer courses."**
- ✓ **"Different pathways:** *Completed over a short period of time or over several years*
- ✓ *"Part-time or Full-time."*
- ✓ **"Smaller course load."**
- ✓ **"Multiple admission cycles** *during an academic year: Multiple start times."*
- ✓ **"Intensive** *courses done over a week or two during summer."*
- ✓ **"Paid** *practicums."*
- ✓ *"Affordable. No huge expenses."*
- ✓ *"Recognition of experience and prior knowledge."*

The background of the slide features a stylized, hand-drawn illustration of several overlapping leaves. The leaves are rendered in a dark grey color with fine, parallel lines indicating their texture and veins. They are arranged in a way that suggests depth and movement, with some leaves in the foreground and others receding into the background. The overall aesthetic is clean and modern, with a focus on natural elements.

Learner Profiles (Personas) Emerging from the Results

Survey (106)

Interviews (6)

School Boards Consultations (3)

Research-based Learner Profiles (i.e., personas)

- Fictional representations of different types of learners based on research and data.
- Provide a deeper understanding of learners' needs, preferences, goals, and motivations.
- Help educators tailor their academic programs to meet the diverse needs of their target audience.
- Three distinct learner profiles emerged from the analysis of quantitative data (i.e., survey) and qualitative data (i.e., one-on-one interviews):
 - The Seasoned Teacher
 - The Career Changer
 - The Former Graduate Student
- Each profile includes a short biography, demographic information, challenges, summary of goals, and learning needs

Rosemary

the Seasoned Teacher



Demographics

- Mostly female
- Age 50-59
- Bachelor's degree
- 20+ years of Teaching Experience
- Elementary & Secondary school teacher
- Has received LOTs every year for the last 15 years.

About

Rosemary, a seasoned teacher, is a lifelong learner in her late fifties and has a bachelor's degree. She receives teaching contracts every year and excellent evaluations from several school principals. She instills her love for learning in her students and strives to motivate and improve their learning. She seeks acknowledgement for her long journey and dedication to her students' academic development and continues to welcome any PD opportunity to improve her teaching practices and student performance.



Rosemary, the Seasoned Teacher



Challenges & Frustrations

- Getting recognized for her long career and experience in the classroom
- Finding a short, specialized program responsive to her learning needs
- Losing her salary at this point in her career
- Balancing an education with her full-time job



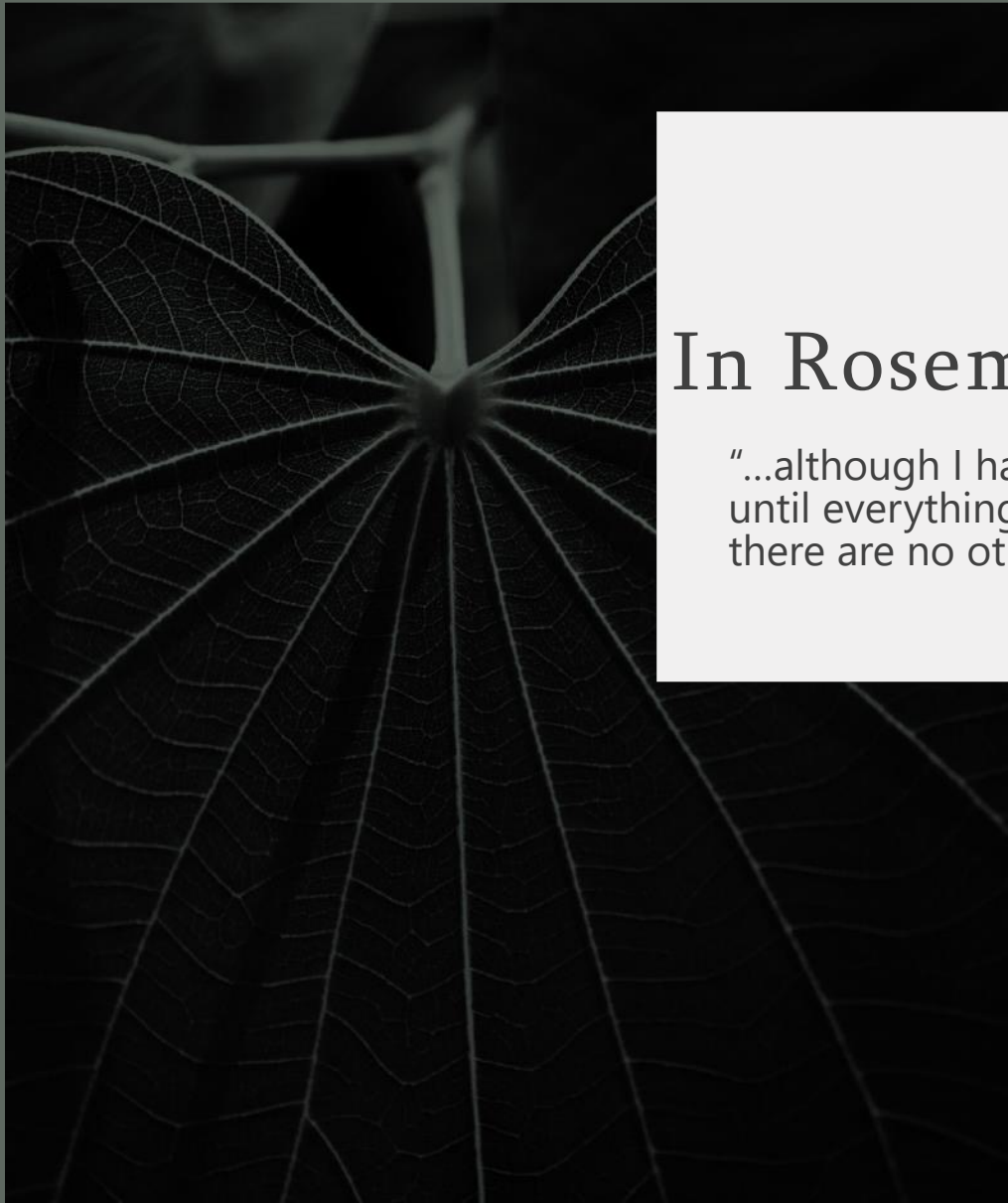
Goals

- Getting acknowledged for all her hard work and dedication
- Joining a fast-track teacher education program tailored to her experience and needs
- Getting paid for a stage or using any class she's teaching to complete the stage requirements.



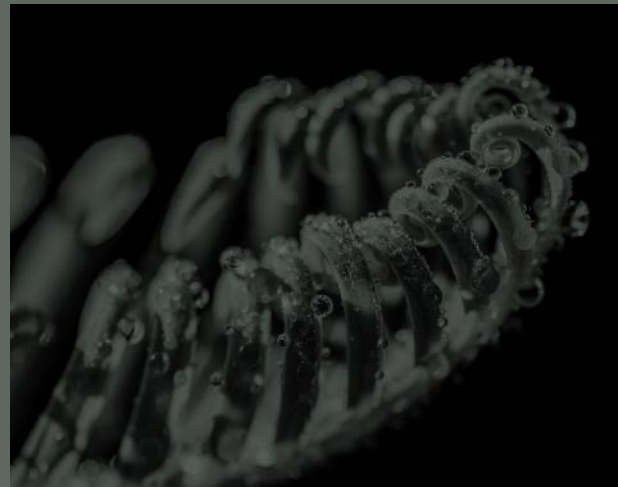
Learning Needs

- Designing and planning teaching and learning activities more effectively.
- Using educational digital technologies to the fullest to benefit students.



In Rosemary's words:

"...although I have been teaching 20 years, I am not on a call back list. I must wait until everything is done and I will get my call two days before school starts and there are no other teachers. Then I will get called and offered a contract."



Debbie

the Career Changer

Demographics

- Mostly female
- Age 40-49
- Bachelor's degree
- Pursued a career transition into teaching
- 15+ years of Teaching Experience
- Experience working with reserve students, at risk youth, and children with IEPs in elementary schools
- Has received LOTs every year for the last 8 years



About

Debbie has a repertoire of skills and expertise from her previous career as a behaviour consultant. She is in her mid-forties and has completed the TIP training offered by her school board when she transitioned into teaching 15 years ago. She is a passionate and dedicated teacher helping students become autonomous as they transition to high school. However, she is frustrated about the stigma of being an uncertified teacher. She would benefit from a RAC process that will recognize her skills and experiences closely related to teaching and learning.

Debbie, the Career Changer



Challenges & Frustrations

- Getting recognized for her education, previous experience, and professional skills
- Getting rid of the stigma of being an unqualified teacher
- Having to do a practicum despite her extensive experience in the classroom



Goals

- Getting official recognition for experience and professional competencies - RAC
- Joining a fast-track teacher education program tailored to her experience and needs
- Taking most courses in the summer to finish the program fast
- Replacing obligatory practicums with observations, coaching and competency assessment.



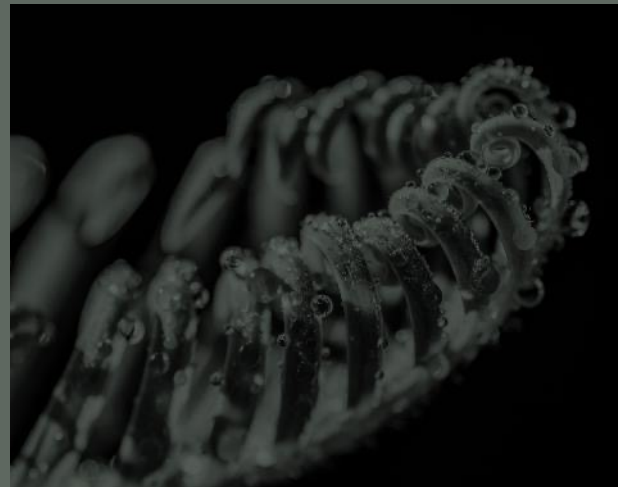
Learning Needs

- Using educational digital technologies to the fullest to benefit students.
- Using different methods for evaluating knowledge acquisition.



In Debbie's words:

"I need a program that recognizes my experiences and skill set [RAC], tailored to my learning needs; not a cookie cutter."



Andrew the Former Graduate Student



Demographics

- Age 30-39
- Bachelor's and master's degrees
- 5 – 8 years of Teaching Experience
- Lives in a remote French area
- Has young kids
- Started subbing (full-time contracts) in 2018
- Became a homeroom service teacher this academic year

Andrew is between the ages of 30 and 40, and has bachelor's and master's degrees in sciences. He wants to advance his career, increase his job opportunities, job security, and salary. He is contemplating a MATL degree at McGill to get his Brevet. However, he lives far away and will have to move his entire family. He also thinks that MATL is a very long program that doesn't meet his academic needs.

Andrew, the Former Graduate Student



Challenges & Frustrations

- Having to relocate his family to join a teacher education program
- Finding a specialized online program offered in English responsive to his learning needs
- Not being equipped to differentiate instruction for the 30% students with special needs in his classrooms



Goals

- Joining a one or two-year online teacher education program without having to move his family
- Getting paid for the practicums



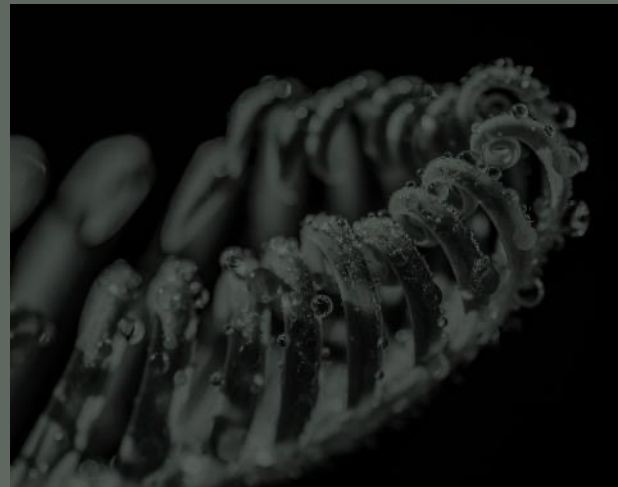
Learning Needs

- Using educational digital technologies to the fullest to benefit students.
- Understanding the different "codes".
- Implementing different IEPs in his classroom.
- How to differentiate teaching practices



In Andrew's words:

"I don't know what a Letter of Tolerance is. I have had full-time teaching contracts for the last five years, and this year I am a home service teacher."





Credibility, Trustworthiness and Limitations

Data Triangulation from:

- Administrator and teacher perspectives
- Multiple school boards
- Multiple teachers

Limitations:

- Qualitative study
- Representative but not necessarily comprehensive sample



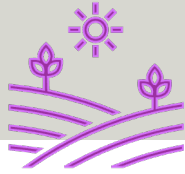
Teachers' Wish List

Teachers' Wish List



Online

"Very few people are in a position to be missing a paycheck for 6 weeks (or even 3 months in the case of the MATL)."



Fieldwork vs Stage

"Circulating a few different schools to see how they do things differently ... different ways of teaching as opposed to how to teach a certain grade/subject matter."



RAC

"Recognition of diploma and years of experience combined with letters of recommendation to obtain a certificate."

Teachers' Wish List (cont.)



Hands on, Practical Modules

" A program that would be very practical would be interesting but if its less hands on than what I'm already doing, I would not be super motivated."



Special Education

"... essential to have a program ..to support students with special needs and at-risk students who are not reaching high school graduation."



Get it done

"This new program is exactly what people like myself need. I feel like I have a **new opportunity** to achieve my **dream** and **passion**."

"I am **ready** and **willing** to **do** whatever it takes."

Appendix 5: Needs Analysis and Surveys

5.1 Uncertified Teachers Survey

Survey Design and Data Collection Method

- Target Population: Teachers on letters of tolerance with a bachelor's degree and years of experience teaching in Quebec schools
- Purpose: to collect essential data that provides a deeper understanding of the teachers' needs, preferences, challenges, and motivations.
- Sample selection process: snowball method
- Online survey created in Microsoft Forms
- Ran from March 10 – June 9, 2023

For a complete response to the survey sent to uncertified teachers in Quebec, please refer to [Appendix 5: Survey Responses.xlsx](#)

The following is the list of the survey questions distributed to schools in Quebec:

Introduction:

The teacher turnover and shortage in Quebec has significantly impacted the public school system. In addition, this teacher shortage has led to opportunities for people to enter the teaching profession without having a formal education or legal certification to teach in Quebec. To provide teachers with an accessible way to receive that education, obtain certification and enjoy more stable job prospects, the government has announced a new initiative to create a 30- credit program leading to teacher accreditation.

Concordia University is conducting consultations with many school board stakeholders, including uncertified teachers, teachers on a letter of tolerance and substitute teachers. We would like to hear about the challenges and issues you are facing to best design a flexible, short-term, focused teacher certification program responsive to the current teacher shortage.

Our working group has prepared this anonymous questionnaire. Your answers to the survey questions will help us design and develop a teacher certification program accordingly. It will take you 5-10 minutes to complete. Thank you in advance for your feedback!

Demographics:

1. What type of appointment do you hold?
2. For which school board do you teach?
3. What is your educational background?

Teaching Experience:

4. Is teaching your primary profession/career? If not, have you considered a career in teaching?
5. If you are currently teaching in a Quebec school, please choose one of the following options.
6. I have a teaching license from Quebec
7. I have a Provisional Teaching License

8. I have a Letter of Tolerance
9. I do not have any teaching license
10. How long have you been teaching?
11. At what level do you teach?
12. What subject(s) do you teach or substitute?

13. Do you find there is a difference between how fully credentialed, those on a letter of tolerance and those teaching without legal status are treated (In terms of job security, total rewards, choice of courses, etc.)? If so, how?
14. What are the admission/job requirements for acquiring a letter of tolerance to teach at your current school
15. What resources are currently available to you to develop your teaching practice? Which of those, if any, do you engage in?

General Feedback:

16. Have you looked into options for acquiring an academic degree leading to a teaching license? If so, what was your view of or experience with these options?

17. If you are a substitute teacher or teaching on a letter of tolerance, would you be interested in acquiring a teaching license?

18. Would you be interested in completing an online, short-term teacher education program leading to the teaching license?

19. What would you need in this program to make the process accessible/feasible for you?

20. What knowledge, skills and abilities are essential for you to acquire in this program?

21. How would a short-term teacher education program benefit you personally or professionally?
22. If you do not feel such a teacher education program would benefit you, please explain why.
23. Would you be willing to be interviewed by a member of the Concordia project? If so, please provide your contact information.
24. Is there anything you would like to add about a new program that would provide a more accessible way to obtain a teaching license?

5.2 Uncertified Teachers Interviews

Selection Criteria

- Most respondents to the survey disclosed their contact information and agreed to meet with us.
- Diversity of experience: educational background, years of experience, subject(s) taught
- Representation from both elementary and secondary school teachers
- Interviewees: 5 female teachers; 1 male teacher (According to Statistics Canada in 2011: 84% of all elementary school and kindergarten teachers are women. 59% of all secondary school teachers in Canada are women)

Process

- One-on-one interviews conducted between April 26 – May 11
- 6 Uncertified teachers on letters of tolerance
- Distributed interview questions via email in advance of each meeting
- 1 hour each conducted over Zoom
- Two interviewers took and compared notes
- Findings were used to create three learners' profiles

Outreach email to Uncertified Teachers

Subject line: Request for Consultation - Concordia University

Dear xxx,

We hope you are doing great. We, Dalia Radwan and Salvatore Costanzo Jr., are part of the Curriculum Developers Team from Concordia University, responsible for collecting data to support the development of a 30-credit teacher certification program in response to Quebec's education minister's plan to fast-track teacher training.

Thank you for taking the time to complete our Teacher's Survey. We truly value the information you have provided and your willingness to meet to help us collect the necessary data.

Would it be possible for you to set aside 60 minutes to discuss your perspective on this project? If so, we have set aside the following dates for consultations:

Available 9am to 5pm on April 14, 15, 16, 26, 27, and 28

Please let us know what day/time works best for you.

In advance of the meeting, we will send you both the Zoom link and our questions for your review.

We appreciate your interest in our project. Your input will be invaluable.

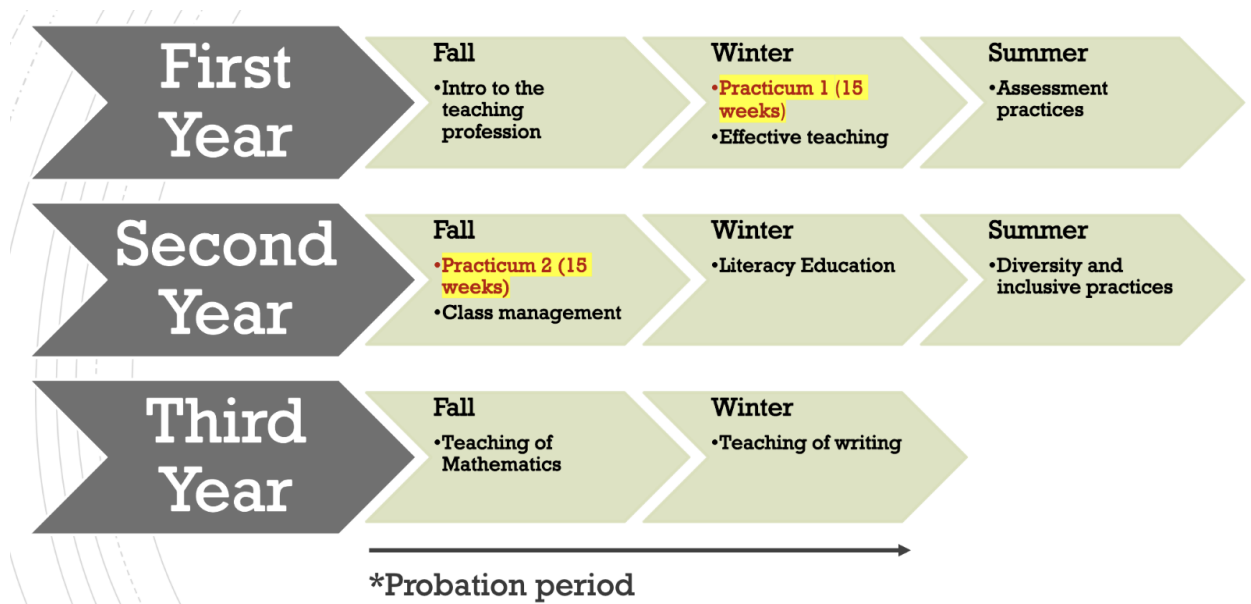
Kindly,

Dalia and Sal

Interview Questions

1. Do you mind me asking how old you are?
2. What challenges have you faced in acquiring a teaching license?
3. Describe your work history.
4. What's something about your previous job that you carried over and helped you get going in a classroom setting?
5. Out of the following [core competencies for teachers](#) working in Quebec, which are you most comfortable with and autonomous, and which competencies would you like to grow and develop?
 - a. Design and plan teaching and learning activities and situations that are appropriate for the students, the learning content and the education objectives.
 - b. Develop, choose and use different methods for evaluating knowledge acquisition and competency development.
 - c. Manage how the class operates: Organize and manage a class in such a way as to maximize student development, learning and socialization

- d. Implement, as part of an inclusive teaching approach, strategies for differentiating teaching practices so as to support the full participation and success of all students (with different abilities)
 - e. Use digital technologies in order to benefit students and all education stakeholders.
6. Can you talk more about the PD opportunities (e.g., TIP program) you have received/participated in at your school board? What skills did these PD activities help you develop?
 7. What other skills would you like to improve/develop?
 8. The following is the curriculum of a 30-credit Teacher Education program in preschool and primary education that TELUQ will offer as of Fall 2023. From your perspective, which courses are valuable, which ones would you replace, and which are missing?



9. TELUQ will offer this program online, part-time, and has designed it to take two and a half years to complete (i.e., approx. one course per semester). From your perspective, is the program design accessible for current teachers teaching on contracts and LOTs? Is there anything that you would change or add? For example, asynchronous and/or synchronous learning.

5.3 Ministry, School Boards, and Service Centres Consultations

Questions for Administrators

1. Describe the current staffing issues your schoolboard/school has been having with the teacher shortage.
2. In which levels/subjects is there the most shortage?
3. What measures have you taken to fill teaching positions?
4. What are your general hiring requirements for teachers without certification?
5. What type of support measures have you put into place to support those teachers and your staff in general throughout this context?

6. What is the general profile of a teacher teaching on a letter of tolerance or no certification?
- Education level
 - Years of experience
 - Age
 - Gender
 - Other
7. If there were a 30-credit teacher certificate program, how likely do you consider these teachers would take the program?
8. What do you identify as the main competencies to be developed in the curriculum of this program?
9. What do you consider as a valid pre-requisite to the program? Number of years of experience? Degree backgrounds? Other?
10. How important do you consider a practicum for these teachers? What could it look like in your school board?
11. How would a 30-credit certification program benefit these teachers? Professionally?
12. What impact would it have in 6 months, 12 months, 2 years into teaching?
13. How would a 30-credit certification program benefit your school board/school?

Appendix 5: Ministry, School Boards, and Service Centres Consultations

Consultation Structure

Internal Process	Demographics	Main Questions
<p>Target Population: Administrators Human resource professionals Other roles responsible for the recruitment of teachers at Quebec Boards Guiding question: How are Quebec school boards coping with a lack of certified teachers? Also Collect data on the lack of certified teachers from the employers' perspective: Statistics on teachers issued letters of tolerance, process of issuing letters of tolerance Challenges with staffing and approaches to filling the gaps of qualified teachers.</p> <p>Sample selection process & size based on available resources Ran from February 23 to April 6, 2023</p>	<p>Assistant Director, Human Resources. Lester B. Pearson. Coordinator, Teacher Recruitment and Retention Project. Quebec School Boards. Assistant Director General, Eastern Townships School Board.</p>	<p>Describe the current staffing issues your schoolboard/school has been having with the teacher shortage. What measures have you taken to fill teaching positions? What are your general hiring requirements for teachers without certification? What type of support measures have you put into place to support those teachers and your staff in general throughout this context? What impact would a short certification program have on your board?</p>

The following is the list of questions sent to all administrators

1. Describe the current staffing issues your schoolboard/school has been having with the teacher shortage.
2. In which levels/subjects is there the most shortage?
3. What measures have you taken to fill teaching positions?
4. What are your general hiring requirements for teachers without certification?
5. What type of support measures have you put into place to support those teachers and your staff in general throughout this context?
6. What is the general profile of a teacher teaching on a letter of tolerance or no certification?
 - Education level
 - Years of experience
 - Age
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 - Other
7. If there were a 30-credit teacher certificate program, how likely do you consider these teachers would take the program?
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9. What do you consider as a valid pre-requisite to the program? Number of years of experience? Degree backgrounds? Other?
10. How important do you consider a practicum for these teachers? What could it look like in your school board?
11. How would a 30-credit certification program benefit these teachers? Professionally?
12. What impact would it have in 6 months, 12 months, 2 years into teaching?
13. How would a 30-credit certification program benefit your school board/school?

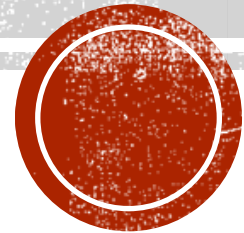
For a summary of all answers received from the administrators, please refer to section



ALTERNATIVE TEACHER CERTIFICATION PROGRAMS: AN ENVIRONMENTAL SCAN REPORT

Presented on March 13, 2023

Updated on January 8, 2024



This document provides a detailed overview and analysis of various alternative teacher certification programs offered by institutions in Canada and the U.S.





This report
includes:

- Seven two-year Bachelor of Education programs and one 12-month Bachelor of Education program.
- Thirteen post-graduate certificates and master's degrees leading to teaching certification in preschool, primary or secondary education.
- Twelve (15) post-secondary institutions in Canada and seven (7) post-secondary institutions in the U.S. offer these programs.
- Information gathered includes each institution's program description, learning outcomes, delivery methods, program length, admission cycles, concentrations, degrees offered, and value-added or innovative curriculum components.

UNIVERSITIES INCLUDED IN THIS STUDY:

Universities in Canada	Universities in the U.S.
Brock University McGill University Simon Fraser University Université de Montréal Université du Québec en Abitibi-Témiscamingue (UQAT) University of Alberta University of British Columbia University of Calgary University of Laval University of Niagara in Ontario University of Prince Edward Island University of Sherbrooke University of Toronto University of Regina Université TELUQ York University	Drexel University Cal State East Bay Niagara University Rider University San Francisco State University University of Hawai'i at Mānoa University of Michigan



2-YEAR BACHELOR'S DEGREES

University of Calgary: students with a bachelor's degree can enrol in a two-year online community-based Bachelor of Education degree. Students gain teaching experience in their local community through Field Experience & practicum placements.

York University: Participants with a bachelor's degree interested in teaching K-12 students can complete a two-year consecutive professional Bachelor of Education.

Similar programs are offered by Brock University, the University of Prince Edward Island, the University of British Columbia, the University of Alberta, the University of Niagara in Ontario, and the University of Regina. All these programs take at least two years to complete except for the 12-month program at UPEI.

Graduates of these programs meet the teacher certification requirements for their respective provinces in Canada.



POST-SECONDARY DEGREES

Simon Fraser University offers a 16-month in-person teacher education Professional Development Program (PDP) leading to a teaching certificate issued by British Columbia Ministry of Education. The program goal is to help learners explore educational ideas and their application in the classroom.

The **University of Michigan** offers a 12-unit certificate for candidates who hold a bachelor's degree. Candidates begin with a pre-service induction period that includes self-paced online coursework and a summer practicum experience working with children in an educational setting. Subsequently, candidates teach under a Michigan interim teaching certificate for three years with salary and benefits before earning their Michigan standard teaching certificates.

The **University of Hawai'i at Mānoa** offers a 31-credit post-baccalaureate Certificate in Teacher Education to provide additional pathways to teacher licensure in grades K-6 for individuals with an undergraduate degree in a field other than education. It also provides a path to teacher licensure for paraprofessionals and long-term substitutes working in Hawaii public schools.

Another model is a two-year master's degree leading to teacher certification offered by **McGill University**, **Université de Montreal**, **Université Laval**, **Université de Sherbrooke**, and **University of Toronto**, an online degree at **Western Governors University**, and a remote qualifying master's program offered jointly by **Université du Québec en Abitibi-Témiscamingue (UQAT)** and **Université TELUQ (TELUQ)**.



POST-SECONDARY DEGREES (CONT.)

Rider University - [Part-time Evening Teacher Certification Program](#)

Some universities offer a part-time evening teacher certification program for college graduates and career changers to obtain their initial k-6 teaching certificate while working with students in classrooms. Students can complete this program in three semesters (i.e., between 12-16 months), which usually includes a student teaching experience in the final semester. Students in the part-time program will need to accumulate 175 hours of relevant experience working with student learning prior to their student teaching. Activities such as *substitute teaching* and *tutoring* can count toward this requirement.

Cal State East Bay – [Online Single Subject Teaching Credential](#)

This program is ideal for candidates with bachelor's degrees and whose lifestyle does not support an on-campus program. The program is offered online and comprises 17 courses completed over 12 months. Successful program completers are qualified for a single subject teaching credential that allows them to teach at the middle and high school level (grades 6-12). Candidates can choose one of the following subjects: Art, English, Dance and Theater, Music, Physical Education, Social Science (History), and languages other than English.

San Francisco State University - [Multiple Subject Teaching Credential](#)

The 3-semester SFSU Multiple Subject Credential Program (MSC) provides comprehensive preparation for graduates to become highly effective teachers across a range of elementary grade classrooms (typically grades Tk-6).



30-CREDIT DIPLOMA PROGRAMS IN QUEBEC

TELUQ– DESS in preschool education and primary education

This diploma is designed for uncertified practicing preschool and primary school teaching staff with bachelor’s degrees. The program includes eight core courses covering the fundamental knowledge and skills required to be effective pre-school, primary, or secondary school teachers and two internships

TELUQ–DESS in teaching English as a second language

This diploma is designed for uncertified teachers with bachelor degrees interested in teaching English as a second language at primary and secondary levels. Coursework include didactics of language skills for primary and secondary schools (teaching of speaking, listening, reading and writing).

TELUQ–DESS in teaching French as a second language

This program is open exclusively to uncertified teachers with bachelor degrees interested in teaching French as a second language at primary and secondary levels.



30-CREDIT DIPLOMA PROGRAMS IN QUEBEC (CONT.)

UQAT–DESS Qualifying in Secondary Education, Mathematics

This program is designed for uncertified practicing school teaching staff with bachelor's degrees in mathematics. The courses included in this program are focused on providing students with a deep understanding of the concepts of mathematics and how to teach them effectively to students in the secondary level.

UQAT–DESS Qualifying in Secondary Education, French as a Second Language

This program is designed for uncertified practicing school teaching staff with bachelor's degrees in French studies or equivalent. The courses included in this program are focused on helping students teach French effectively to students at the secondary school level.

So far, there are only five short post-secondary programs leading to the teaching license in Quebec, pending the ministry's approval and exclusively offered for those with a proven employment link with a school service center or school board.



FINDINGS

- Programs vary in length and number of credits but share many commonalities
 - Number of credits ranges from 21 to 60 credits
 - Program length varies from one to two full years
- Although programs vary in length and number of credits, they share many commonalities, precisely admission requirements, program structure, course work and sequence, and the practicum component. All programs are offered in either a full or part-time format
- All programs include teaching experience in elementary classrooms (1-3 practicums).
- Teacher education and certification programs of less than four years are typically accessible only to those who hold a bachelor's degree.
- The length and number of credits correlate highly with the final degree awarded to students.

MOST COURSEWORK CONSISTS OF:

Teaching in the content areas (including Early literacy, mathematics, social studies, science, and Fine Arts)

Foundations of education (including educational research, learner development, skill development, planning for instruction, instructional strategies, and assessments)

Inclusive practices/educating exceptional students

Mandatory supervised teaching experiences in an educational setting



ADMISSION REQUIREMENTS

- Most universities require applicants to have at least a bachelor's degree, preferably with a major in the academic subject they would like to teach, have volunteer or work experience in a group setting with children or youth, preferably at the age level they wish to teach, and two to three letters of recommendation (academic, professional or volunteer are acceptable).
- This background allows individuals to complete the program in one to two years and accelerate their transition to the classroom.



BLUE-SKY PROGRAMS



FAST-TRACKING QUALIFIED IMMIGRANT TEACHERS

- Immigrant teachers can apply to the RAC-EFÉ process if they ...
- Are authorized to teach in their country
- Have training in teaching a school subject
- Have been refused a Probationary teaching permit but invited by the Ministry of Education to engage in the RAC-EFÉ at UdeM.

*****RAC-EFÉ + 15-credit Undergraduate Microprogram in Teaching Qualification from Université de Montreal + a probationary period of 600 to 900 hours*****



LADDERING OF A TEACHER CERTIFICATION PROGRAM INTO A MASTER OF ARTS DEGREE

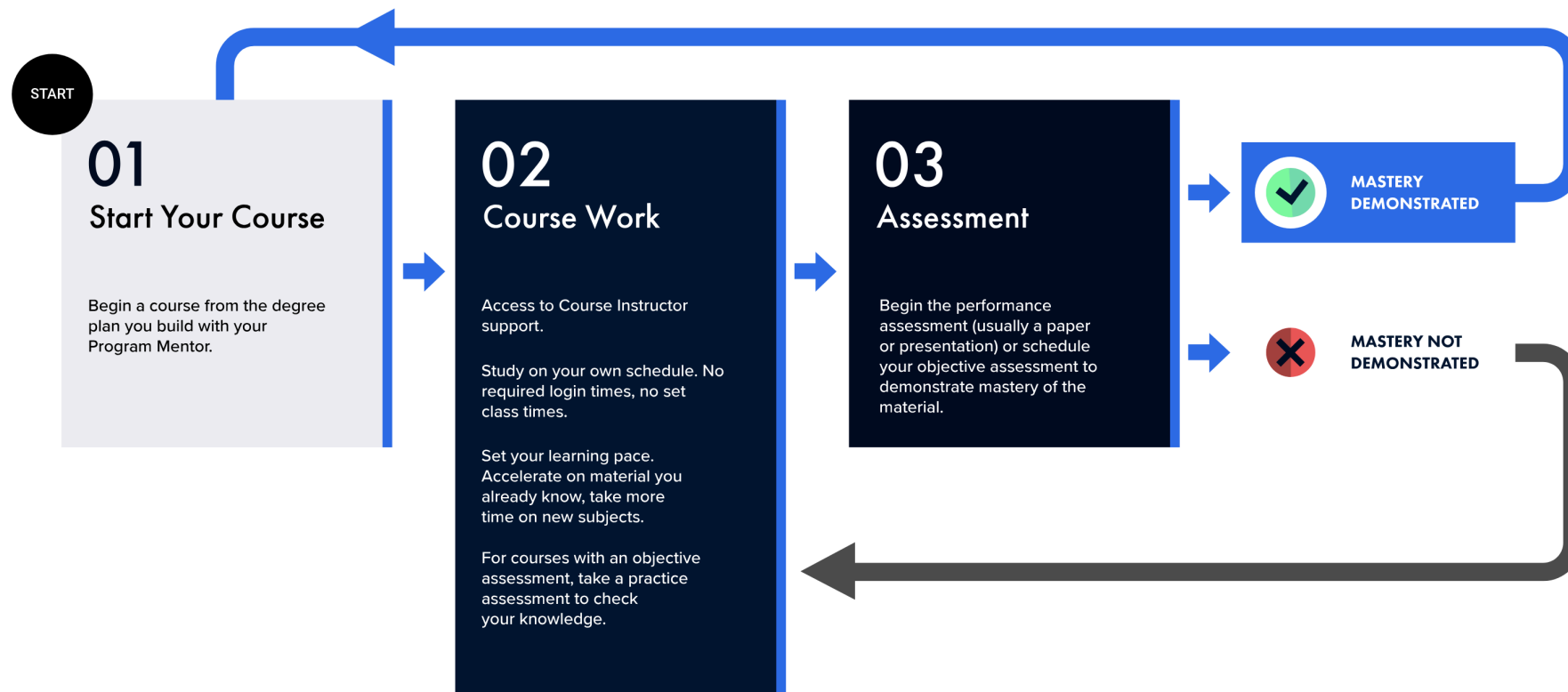
Rider University (NJ):

- Students complete a (21-24 credit) Post-Baccalaureate evening, part-time program in Elementary Education leading to a teaching license
- Students can transfer all the credits from the Post-Baccalaureate Teacher Certification program into a 30-credit Master of Arts in Teaching (MAT) degree.



COMPETENCY-BASED PROGRAM

- Online Master's Degree in Elementary Education Leading to a Teaching License–Western Governors University – Online, self-paced, CBL program



Practicum	For Early Childhood and Childhood and Secondary Education: 1. EDU 681PA CANADIAN STUDENTS ONLY TEACHING PRACTICUM - 3 credits ***75 Hours Field Experience ***75 Hours Teaching Assistantship	Yes	Yes, 30 credits total 18 hours/week Classroom Observation 4 days/week for 16 weeks (January start); Teaching two courses	All students will complete two student teaching experiences for a total of 14 weeks.		[E 40] Teaching Residency, Field Experience, 1 day/week (6 credits)	One semester of full-time student teaching.	For the elementary program, mandatory field-based experiences and 12 weeks of student teaching.	One full semester of in-class teaching with master teacher supervision.							
Prior learning recognition	Not assessed	Yes. That you have a BA is recognized and allows you to complete a second BA plus Teacher Certification in 11 months.					Upon application to and before admission to any graduate degree program in education, leadership, and counseling, students may request transfer of up to 12 semester hours of graduate credits completed at an									

Letters of Support

Note: Some of the following letters of support refer to the Diploma in Teaching Qualification. The program title has since been modified to Graduate Diploma in Teacher Certification.



Le 24 janvier 2024

Teresa Hernandez Gonzalez
Doctorat, directrice, Programmes du 1er cycle
Département de l'éducation
Université Concordia
1610 Sainte-Catherine Ouest, bureau FG 5.111
Montréal (Québec) H3H 2S2

et

Nathalie Rothschild
Doctorat, directrice, Éducation préscolaire et enseignement primaire
Département de l'éducation
Université Concordia
1610 Sainte-Catherine Ouest, bureau FG 5.111
Montréal (Québec) H3H 2S2

Objet : Lettre de soutien au DESS qualifiant en enseignement

Mesdames,

Je vous écris au nom de la Commission scolaire Riverside pour vous faire part de notre soutien sans réserve au projet de diplôme d'études supérieures spécialisées (DESS) de 30 crédits. Nous avons examiné attentivement le résumé et la description du programme, et son introduction correspond parfaitement aux besoins et aux priorités de notre région en matière d'éducation. Nous apprécions également votre engagement à collaborer étroitement avec nous pour identifier les personnes ayant les compétences et les aptitudes requises pour enseigner. Ce partenariat garantit que le programme attire des personnes candidates bien adaptées à la profession d'enseignante, en se concentrant sur ceux et celles qui ont l'expérience nécessaire pour enseigner dans le système.

Les raisons importantes pour notre soutien à ce projet sont les suivantes :

Remédier à la pénurie des personnes enseignantes :

Le programme s'attaque directement au problème critique de la pénurie d'enseignants et d'enseignantes au Québec, en offrant une voie d'accès rapide à la certification.

Développement professionnel pour les personnes enseignantes non certifiées :

L'accent mis sur le développement professionnel de base pour les enseignants non certifiés en poste est conforme à notre engagement de favoriser la formation continue au sein de notre communauté éducative.



Horaires flexibles pour un équilibre entre vie professionnelle et vie privée :

L'horaire flexible du programme est particulièrement remarquable, car il répond aux défis uniques auxquels sont confrontés les éducateurs et éducatrices dans notre région et favorise un bon équilibre entre vie professionnelle et vie privée.

Lutter contre l'épuisement professionnel des enseignants :

Nous apprécions l'approche proactive du programme pour atténuer l'épuisement des enseignants, y compris les composantes de mentorat et de soutien contribuant au bien-être général des enseignants.

Une éducation abordable pour les professionnels et professionnelles en emplois :

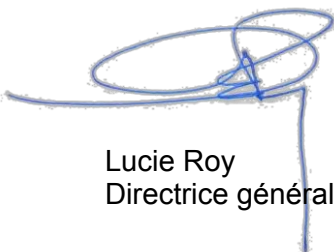
L'engagement du programme à fournir une alternative abordable est essentiel pour nos éducateurs et éducatrices qui font face à des contraintes financières tout en cherchant à se perfectionner.

Le programme de DESS qualifiant en enseignement ne contribuera pas seulement à relever les défis immédiats de notre système éducatif, il permettra également d'améliorer la qualité générale de l'enseignement et de l'apprentissage dans nos écoles. En investissant dans l'éducation, nous investissons dans un avenir plus fort et plus éclairé pour nos élèves. Ils ont traversé de grandes épreuves et moments difficiles au cours des dernières années, entre la pandémie et le manque criant d'enseignants et d'enseignantes. Ces défis ont eu et continue d'avoir un impact sur leur réussite et leur plein potentiel. Nous croyons fermement que le programme de DEES viendra pallier la pénurie de main-d'œuvre dans notre province.

En tant que commission scolaire engagée dans le développement professionnel de enseignants et enseignantes, l'engagement du programme à fournir une alternative abordable est essentiel pour nos enseignants et enseignantes qui font face à des contraintes financières tout en cherchant à se perfectionner. Nous soutenons ce programme et nous nous réjouissons de collaborer étroitement à sa mise en œuvre réussie.

Nous vous remercions de prendre en considération notre lettre de soutien. L'introduction de ce programme sera un ajout précieux à notre paysage éducatif.

Je vous prie d'agréer, Mesdames, l'expression de mes sentiments distingués.



Lucie Roy
Directrice générale

January 22, 2024

Teresa Hernandez Gonzalez
PhD, Undergraduate Programs Director
TESL unit, Department of Education
Concordia University
And
Nathalie Rothschild
PhD, Director, Early Childhood and Elementary Education
Department of Education
Concordia University

Dear Ms Hernandez Gonzalez and Ms Rothschild,

Subject: Letter of Support for the Diploma in Teaching Qualification Program

I am writing on behalf of the Association of Directors General of the English School Boards of Quebec (ADGESBQ) to express our enthusiastic support for the proposed Graduate-level 30-credit Diploma in Teaching Qualification program. We have reviewed the program executive summary and description, and its introduction aligns seamlessly with the educational needs and priorities of the English school boards of Quebec. We also appreciate your commitment to collaborate closely with our school boards to identify individuals with the right teaching qualities and aptitudes. This partnership ensures that the program attracts candidates well-suited for the teaching profession, focusing on those with the necessary experience teaching in the system.

The Diploma in Teaching Qualification program will not only contribute to addressing the immediate challenges in our education system, which we highlight below, it will also enhance our schools' overall quality of teaching and learning.

- Addressing Teacher Shortage
- Professional Development for Uncertified Teachers
- Flexible Schedule for Work-Life Balance
- Addressing Teacher Fatigue
- Affordable Education for Working Professionals

As the Association of Directors General we are committed to the professional development of our educators, we thus endorse this program and look forward to collaborating closely to ensure its successful implementation.

Thank you for considering our letter of support. The introduction of this program will be a valuable addition to our educational landscape.

Sincerely,



Lucie Roy

President



January 16th 2024

Ms Sherry Blok
Senior Director, Executive and Professional Programs
Concordia University

Subject: Letter of Support for the Diploma in Teaching Qualification Program

Dear Ms Blok;

I am writing on behalf of the Eastern Shores School Board to express our enthusiastic support for the proposed Graduate-level 30-credit Diploma in Teaching Qualification program. We have thoroughly reviewed the program executive summary and description, and its introduction aligns seamlessly with our region's educational needs and priorities. We also appreciate your commitment to collaborate closely with us to identify individuals with the right teaching qualities and aptitudes. This partnership ensures that the program attracts candidates well-suited for the teaching profession, focusing on those with the necessary experience teaching in the system.

By providing the anglophone community and school boards with this program, this will:

Address Teacher Shortage:

The program directly addresses the critical issue of teacher shortage in Quebec, offering an expedited yet comprehensive pathway to certification.

Provide Professional Development for Uncertified Teachers:

The emphasis on providing essential professional development for uncertified practicing teachers aligns with our commitment to fostering continuous growth within our educator community.

Grant a Flexible Schedule for Work-Life Balance:

The program's flexible schedule is particularly noteworthy, catering to the unique challenges faced by educators in our region and promoting a healthy work-life balance.

Address Teacher Burnout:

We appreciate the program's proactive approach to mitigating teacher burnout, including mentorship and support components contributing to overall teacher well-being.

... 2





- 2 -

Provide Affordable Education for Working Professionals:

The program's commitment to providing an affordable alternative is essential for our educators who face financial constraints while seeking advanced education.

The Diploma in Teaching Qualification program will not only contribute to addressing the immediate challenges in our education system. Still, it will also enhance our schools' overall quality of teaching and learning.

As a school board committed to the professional development of our educators, we endorse this program and look forward to collaborating closely to ensure its successful implementation.

Thank you for considering our letter of support. The introduction of this program will be a valuable addition to our educational landscape.

Sincerely,

Lisa Cleary
Superintendent of Human Resources
Eastern Shores School Board





COMMISSION SCOLAIRE SIR-WILFRID-LAURIER
SIR WILFRID LAURIER SCHOOL BOARD

January 16, 2024

Ms. Sherry Blok
Senior Director, Executive and Professional Programs
Concordia University

Subject: Letter of Support for the Diploma in Teaching Qualification Program

Dear Ms. Blok,

I am writing on behalf of the Sir Wilfrid Laurier School Board to express our enthusiastic support for the proposed Graduate-level 30-credit Diploma in Teaching Qualification program. We have thoroughly reviewed the program executive summary and description, and its introduction aligns seamlessly with our region's educational needs and priorities. We also appreciate your commitment to collaborate closely with us to identify individuals with the right teaching qualities and aptitudes. This partnership ensures that the program attracts candidates well-suited for the teaching profession, focusing on those with the necessary experience teaching in the system.

The program directly addresses the critical issue of teacher shortage in Quebec, offering an expedited yet comprehensive pathway to certification. The emphasis on providing essential professional development for uncertified practicing teachers aligns with our commitment to fostering continuous growth within our educator community. The program's flexible schedule is particularly noteworthy, catering to the unique challenges faced by educators in our region and promoting a healthy work-life balance. We appreciate the program's proactive approach to mitigating teacher burnout, including mentorship and support components contributing to overall teacher well-being.

The Diploma in Teaching Qualification program will not only contribute to addressing the immediate challenges in our education system. Still, it will also enhance our schools' overall quality of teaching and learning.

As a school board committed to the professional development of our educators, we endorse this program and look forward to collaborating closely to ensure its successful implementation.

Thank you for considering our letter of support. The introduction of this program will be a valuable addition to our educational landscape.

Sincerely,

Stephanie Krenn
Director, Human Resources

T 450-621-5600
1 866-621-5600
F 450-621-7929

235, montée Lesage
Rosemère (Québec)
J7A 4Y6



swlauriersb.qc.ca
f in





Commission scolaire
Lester B. Pearson
School Board

January 23, 2024

Nathalie Rothschild PhD
Director, Early Childhood and Elementary Education
Department of Education
Concordia University

Teresa Hernandez Gonzalez PhD
Undergraduate Programs Director
TESL Unit
Department of Education
Concordia University

Subject: Letter of Support for the Diploma in Teaching Qualification Program

Dear Ms. Rothschild and Ms. Hernandez Gonzalez,

I am writing on behalf of the Lester B. Pearson School Board to express our enthusiastic support for the proposed Graduate-level 30-credit Diploma in Teaching Qualification program. We also appreciate your commitment to collaborate closely with us to identify individuals with the right teaching qualities and aptitudes. This partnership ensures that the program attracts candidates well-suited for the teaching profession, focusing on those with the necessary experience teaching in the system.

At Lester B. Pearson School Board, we are particularly in need of French Second Language teachers. A new program to help us recruit qualified teachers in this field would be in our outmost interest.

Addressing Teacher Shortage:

The program directly addresses the critical issue of teacher shortage in Quebec, offering an expedited yet comprehensive pathway to certification. It would also be beneficial if the programs could be open to candidates who are not currently under our employment, in order to add candidates to our qualified teacher's bank.

Professional Development for Uncertified Teachers:

The emphasis on providing essential professional development for uncertified practicing teachers aligns with our commitment to fostering continuous growth within our educator community.

Flexible Schedule for Work-Life Balance:

The program's flexible schedule is particularly noteworthy, catering to the unique challenges faced by educators in our region and promoting a healthy work-life balance.

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The Diploma in Teaching Qualification program will not only contribute to addressing the immediate challenges in our education system, it will also enhance our schools' overall quality of teaching and learning.

As a school board committed to the professional development of our educators, we endorse this program and look forward to collaborating closely to ensure its successful implementation.

Thank you for considering our letter of support.

Sincerely,



Anne-Marie Lavoie, CRHA
Assistant Director, Human Resources Department

January 22, 2024

Teresa Hernandez Gonzalez, PhD
Undergraduate Programs Director, TESL unit
Department of Education

Subject: Letter of Support for the Diploma in Teaching Qualification Program

Dear Ms. Hernandez Gonzalez,

I am writing on behalf of the Eastern Townships School Board to express our enthusiastic support for the proposed Graduate-level 30-credit Diploma in Teaching Qualification program. We have reviewed the program executive summary and description, and its introduction aligns seamlessly with our region's educational needs and priorities. We also appreciate your commitment to collaborate closely with us to identify individuals with the right teaching qualities and aptitudes. This partnership ensures that the program attracts candidates well-suited for the teaching profession, focusing on those with the necessary experience teaching in the system.

As we applaud the alignment of the proposed Graduate-level 30-credit Diploma in Teaching Qualification program with our region's educational needs and priorities, we also recognize the vital role of professional development in fortifying our teaching workforce. Investing in professional development for uncertified teachers stands as a pivotal strategy in addressing the prevailing teacher shortage while simultaneously enhancing the overall quality of education. By providing targeted training and mentorship programs, uncertified educators can acquire the necessary skills and knowledge to excel in the classroom. Moreover, coupling professional development initiatives with a flexible schedule further amplifies their impact. Recognizing the diverse circumstances of potential educators and accommodating them with a schedule that aligns with their needs not only attracts a wider pool of talent but also ensures a more inclusive and adaptable teaching workforce. In essence, the combination of professional development opportunities and a flexible schedule represents a holistic approach to tackling the teacher shortage crisis, fostering a dynamic and resilient educational environment for both teachers and students alike.

The Diploma in Teaching Qualification program will not only help tackle the current challenges in our education system but also elevate the overall quality of teaching and learning in our schools.

As a school board committed to the professional development of our educators, we endorse this program and look forward to collaborating closely to ensure its successful implementation.

Thank you for considering our letter of support. The introduction of this program will be a valuable addition to our educational landscape.

Sincerely,



Kandy Mackey
Director General
Eastern Townships School Board

January 23, 2024

Teresa Hernandez Gonzalez, Undergraduate Programs Director
TESL Unit, Department of Education,
Concordia University
1455 Blvd de Maisonneuve Ouest
Montreal, Quebec
H3G 1M8

Dear Professor Hernandez Gonzalez,

Subject: Letter of Support for the Diploma in Teaching Qualification Program

I am writing on behalf of Western Quebec School Board to express our enthusiastic support for the proposed Graduate-level 30-credit Diploma in Teaching Qualification program. We have thoroughly reviewed the program executive summary and description, and its introduction aligns seamlessly with our region's educational needs and priorities. We also appreciate your commitment to collaborate closely with us to identify individuals with the right teaching qualities and aptitudes. This partnership ensures that the program attracts candidates well-suited for the teaching profession, focusing on those with the necessary experience teaching in the system, including:

Addressing Teacher Shortage: The program directly addresses the critical issue of teacher shortage in Quebec, offering an expedited yet comprehensive pathway to certification.

Professional Development for Uncertified Teachers: The emphasis on providing essential professional development for uncertified practicing teachers aligns with our commitment to fostering continuous growth within our educator community.

Flexible Schedule for Work-Life Balance: The program's flexible schedule is particularly noteworthy, catering to the unique challenges faced by educators in our region and promoting a healthy work-life balance.

Addressing Teacher Burnout: We appreciate the program's proactive approach to mitigating teacher burnout, including mentorship and support components contributing to overall teacher well-being.

Affordable Education for Working Professionals:

The program's commitment to providing an affordable alternative is essential for our educators who face financial constraints while seeking advanced education.

The Diploma in Teaching Qualification program will not only contribute to addressing the immediate challenges in our education system and it will also enhance our schools' overall quality of teaching and learning.

As a school board/service center committed to the professional development of our educators, we endorse this program and look forward to collaborating closely to ensure its successful implementation.

Thank you for considering our letter of support. The introduction of this program will be a valuable addition to our educational landscape.

Sincerely,



Jenny Svetec
Directrice adjointe des ressources humaines
t 819 684 1313 # 520003 / f 819 684 1328
jsvetec@wqsb.qc.ca

February 15, 2024

Ms. Sherry Blok
Senior Director
Executive and Professional Programs
Concordia University

Subject: Recommendations for the Diploma in Teaching Qualification Program

Dear Ms. Blok,

The proposed Graduate-level 30-credit Diploma in Teaching Qualification program responds to the urgent need for school boards to hire qualified teachers to work in their schools. The Quebec English School Board Association (QESBA) and the Association of Directors General of English School Boards of Quebec (ADGESBQ) wish to express their gratitude for this initiative and have sent individual letters of support to include in your application.

We wanted to take the opportunity to highlight a few recommendations for your consideration in the selection process, eligible candidates, and available program clusters.

Selection Process:

In the Diploma of Teaching Qualifications description, there was mention of certain requirements to be eligible to apply to the program. We wish to draw attention to the criteria outlining the need to have 5 years in a part-time or full-time program. To avoid any limitation of applicants, we recommend that there should not be any specified years of experience required. We feel that the application could contain a section that would help to tease out the best candidates without the basis of years of service in a school. We believe that there are candidates that have worked in other sectors than education that would help bring value added experience to their students.

Eligible candidates:

It is outlined that only candidates with teaching experience are eligible to apply. We would like that expanded to include all other educational categories of employment. We have many support staff and professionals who have bachelor's degrees and have had first-hand experience with students. For example, there are many behaviour technicians who have developed experience that is noteworthy to the educational field and whom the 30-credit program would be much more attractive to complete the teaching degree to follow their passion.

Program cluster:

We appreciate the orientation to create clusters: SLTC and PETC that respond to the English network's needs that we have previously identified to the Minister of Education. I hope that future programs can also be developed to meet the increased shortage of secondary science and math teachers.

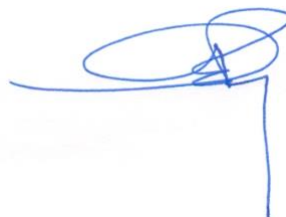
We want to reiterate that this program model responds well to the unique challenges and access of some of our regional school boards due to their geographic location. It also seeks to promote a healthy work-life balance for the candidates in the delivery of instruction and opportunity to apply the teachings of the program in their current work.

The QESBA and ADGESBQ fully endorses this program and looks forward to collaborating closely to ensure its successful implementation. We remain available if you would want to meet to discuss any of the above-mentioned recommendations or help in any way to make this initiative a success.

Sincerely,



David Meloche
Executive Director QESBA



Lucie Roy
President ADGESBQ

cc: Joe Ortona, President, QESBA
Kim Hamilton, Director of Communications and Special Projects, QESBA

January 26, 2024

Teresa Hernandez Gonzalez
PhD, Undergraduate Programs Director
TESL unit, Department of Education
Concordia University

And

Nathalie Rothschild
PhD, Director, Early Childhood and Elementary Education
Department of Education
Concordia University

185 ave Dorval Ave.
Bureau/Suite 502
Dorval QC H9S 5J9
514-849-5900
1-877-512-7522
F 514-849-9228
quesba@quesba.qc.ca

Subject: Letter of Support for the Diploma in Teaching Qualification Program

Dear Ms Hernandez Gonzalez and Ms Rothschild,

quesba.qc.ca  

I am writing on behalf of the Quebec English School Board Association to express our support for the proposed Graduate-level 30-credit Diploma in Teaching Qualification program. We have reviewed the proposed program executive summary and description, and its introduction aligns seamlessly with our English sector educational needs and priorities. We also appreciate your commitment to collaborate closely with our school boards to identify individuals with the right teaching qualities and aptitudes. This partnership ensures that the program attracts candidates well-suited for the teaching profession, focusing on those with the necessary experience teaching in the system. We appreciate the orientation to create clusters: SLTC and PETC that respond to the English network's needs that we have previously identified to the Minister of Education. I hope that future programs can also be developed to meet the increased shortage of secondary science and math teachers.

During the last few years, the teacher shortage has greatly impacted our school boards' ability to provide a qualified teacher in all classes in our schools. Our parents depend on us to provide the best possible education for their children. We strongly encourage all efforts to provide qualified teachers in responding to the critical labor shortage. The implementation of the 30-credit program will provide the platform to enhance the skills and

training of these future qualified teachers. Furthermore, our students will be the ultimate beneficiary from these additional qualified teachers who will guide them through their educational and social development. We believe that this program will allow schools and school boards to improve the overall quality of teaching and learning.

The proposed work-integrated learning design of the 30-credit program will be complimentary to the school boards' induction and mentoring program. These teacher candidates will therefore be well surrounded and supported to ensure a successful start of a fulfilling career in education.

We also appreciate the program's flexible schedule and blended instructional delivery model that includes in-person and online course component. This model responds well to the unique challenges and access of some of our regional school boards due to their geographic location. This also seeks to promote a healthy work-life balance for the candidates.

The QESBA fully endorses this program and looks forward to collaborating closely to ensure its successful implementation.

Thank you for considering our letter of support and the effort to provide qualified teachers for the public English education network.

Sincerely,



David Meloche
Executive Director



Montreal, January 22, 2024

Teresa Hernandez Gonzalez, PhD,
Undergraduate Programs Director, TESL unit, Department of Education
Concordia University
1455 Blvd. De Maisonneuve
Montreal, Quebec
H3G 1MB

Subject: Letter of Support for the Diploma in Teaching Qualification Program

Dr. Gonzalez,

The Association of Administrators of English Schools of Quebec (AAESQ) is a professional provincial association representing over 500 English school, centre, and board level administrators throughout Quebec. Its members are affiliated with ten (10) English school boards, including Kativik, and the Du Littoral Service Center. Among these school boards, the largest two are situated on the island of Montréal, with two additional sizable boards on the north and south shores of Montréal, while the remaining boards encompass the rest of Quebec's territory.

AAESQ focuses on promoting and advocating for high-quality education by cultivating excellence in leadership within the public education system. The Association actively represents the interests of the members both within and beyond the education community.

I am reaching out as the Executive Director of AAESQ to convey wholehearted support from our members for the proposed Graduate-level 30-credit Diploma in Teaching Qualification program. After conducting a comprehensive review of the program's executive summary and description, we observe a seamless alignment between its introduction and the educational needs and priorities of our English education system. Furthermore, we applaud your dedication to working closely with your Anglo community partners in identifying individuals who embody the right teaching qualities and aptitudes. This commitment ensures that the program will draw candidates ideally suited for the teaching profession, particularly those possessing the requisite experience within our educational system.

The Graduate-level 30-credit Diploma in Teaching Qualification program stands as a strategic solution to the numerous pressing challenges currently confronting our education system. One paramount issue it addresses is the shortage of teachers in Quebec, presenting an accelerated yet comprehensive pathway to certification that will significantly contribute to alleviating this scarcity.

Moreover, the program's commitment to offering professional development for uncertified practicing teachers is commendable. This initiative aligns seamlessly with our shared goal of fostering continuous growth within the education community, ensuring that these dedicated teachers receive the necessary support and resources to enhance their skills and effectiveness in the classroom.

Additionally, we appreciate the program's holistic approach to the well-being of its participants. The incorporation of flexible scheduling demonstrates a thoughtful consideration of the unique challenges faced by educators, promoting a healthy work-life balance. Furthermore, the provision of mentorship and support within the program underscores a proactive commitment to addressing the broader aspects of teacher well-being. This approach not only enhances the educational experience but also contributes significantly to mitigating potential burnout and fostering a positive learning environment.

In summary, the Graduate-level 30-credit Diploma in Teaching Qualification program is not merely a program but a comprehensive initiative that actively addresses critical issues in education. From addressing teacher shortage to prioritizing the professional development of practicing teachers and championing teacher well-being, this program represents a significant and commendable contribution to the advancement of our educational landscape.

As an association dedicated to the advancement of professional development of our educators, AAESQ enthusiastically lends its full support to this program. We also eagerly look forward to engaging in partnership to ensure the successful implementation of this initiative.

Sincerely,

Evelyne Alfonsi
Executive Director, AAESQ

c. c. : Julie Carpentier, President, AAESQ
Executive Committee, AAESQ
Board of Directors, AAESQ

Faculty CVs

Appendix 11

Full Detailed Program Expenses and Revenues

Department: EDUC
Program Title: Graduate Diploma in Teacher Certification

NOTE : ONLY NEED TO BE POPULATED

	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5

EXPENSES

Teaching - Number of Full Time positions	TT %	100%	100%	100%	100%	100%	100%
	ETA %	100%	100%	100%	100%	100%	100%
	LTA %	100%	100%	100%	100%	100%	100%
	Lecturer %	100%	100%	100%	100%	100%	100%
Number of course remissions requested		1	1	1	1	1	
Technical support - Number of positions							
Part Time Contracts - Number of contracts			2	2	2	2	
Teacher's Assistants - Hours		240	240				
Administrative Staff - Number of positions	Director %	100%	100%	100%	100%	100%	100%
	Office support %	100%	0.5	0.5	0.5	0.5	0.5
	Professional %	100%	100%	100%	100%	100%	100%
		0					

Comments

ETA is cornerstone fo program / not covered by Government funding
Remssion for Directorship, initially 1/2+1/2 (Teresa and Nathalie), then full to the ETA.
PT contracts for 6 cr/year after year 1 - not covered by Govt funding
TAs to develop self-paced online modules - cost covered by Government funding
Adminstrative position at 1/2 time, not covered by Govt funding

EXPENSES		Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TEACHING	Salary	Salary and Benefits						
Tenure Track		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Extended Term appointment	\$ 80,725	\$ -	\$ 101,956	\$ 101,956	\$ 101,956	\$ 101,956	\$ 101,956	\$ 509,778
Limited Term Appointment		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lecturer		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Course remissions	\$ 12,500	\$ -	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 62,500
Technical support		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Part Time Contracts	\$ 12,500	\$ -	\$ -	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 100,000
Teacher's Assistants	\$ 29.00	\$ -	\$ 6,960	\$ 6,960	\$ -	\$ -	\$ -	\$ 13,920
Stipends		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other		\$ -	\$ 260,000	\$ 210,000	\$ 210,000	\$ 210,000	\$ 210,000	\$ 1,100,000

Put in ETA Lecturer F5 (instead of ETA F1 @ 70.6K\$) - safety measure for experience
Salary of a pedagogue-in-residence for one year (120 000 CAD benefits included), Salary of educational expert to evaluate first course iterations (50,000 for yr 1), travel expenses for participants covered (\$90,000) by govt funding see Revenue Cycle 2. Note that costs aside from the evaluation are factored in as ongoing despite only receiving govt funding for 1-2 yrs

LOI Budget Chart

ADMIN STAFF									
Director		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Office support	\$ 50,000	\$ -	\$ 31,575	\$ 31,575	\$ 31,575	\$ 31,575	\$ 31,575	\$ 157,875	
Professional		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Payroll		\$ -	\$ 412,991	\$ 387,991	\$ 381,031	\$ 381,031	\$ 381,031	\$ 1,944,073	
OTHER EXPENSES									
New Classroom, renovation and lab equipment - NON-CAPITAL								\$ -	
New Classroom, renovation and lab equipment - CAPITAL								\$ -	
Rent								\$ -	
Taxes								\$ -	
Maintenance-Security								\$ -	
Operating cost								\$ -	
Other								\$ -	
Total Other Expenses		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Total Expenses		\$ -	\$ 412,991	\$ 387,991	\$ 381,031	\$ 381,031	\$ 381,031	\$ 1,944,073	

Annual Salary for a Program Assistant at 50% of full time workload not covered by govt funding / Does this include benefits?

Department: EDUC
Program Title: Graduate Diploma in Teacher Certification

NOTE : ONLY NEED TO BE POPULATED

	Year 1	Year 2	Year 3	Year 4	Year 5	Comments
STUDENTS						
Cycle 2 FTE (FTE = 30 credits)						
New Cycle 2 FTE registered in the program	15	30	30	30	30	
Total credits for Program	30					
Attrition rate	10%					
TOTAL FTE	15.00	30.00	30.00	30.00	30.00	
Program Family						
Education						
Weight		2.45				
Weighted FTE	36.75	73.50	73.50	73.50	73.50	

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)	\$ 2,797	\$ 41,955	\$ 83,910	\$ 83,910	\$ 83,910	\$ 83,910	\$ 377,595
Grants							
Teaching Grant (WFTE)	\$ 3,906	\$ 143,546	\$ 287,091	\$ 287,091	\$ 287,091	\$ 287,091	\$ 1,291,910
Support Grant (FTE)	\$ 2,386	\$ 35,790	\$ 71,580	\$ 71,580	\$ 71,580	\$ 71,580	\$ 322,110
Total grants		\$ 179,336	\$ 358,671	\$ 358,671	\$ 358,671	\$ 358,671	\$ 1,614,020
External		\$ 273,920					\$ 273,920
Total Revenue	\$ -	\$ 495,211	\$ 442,581	\$ 442,581	\$ 442,581	\$ 442,581	\$ 2,265,535

Govt funding: \$120,000 pedagogue in residence; \$90,000 travel; 50,000 evaluation; 13,920 for TA's

Additional Funding							
Internal							
Provost Office							\$ -
Institutional							\$ -
Capital Fund (1)							\$ -
Other							\$ -
Total internal sources of funding for the faculty	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Note 1 : Linked to capital expenses

Department: EDUC
Program Title: Graduate Diploma in Teacher Certification

Program Financial Viability

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)		\$ 41,955	\$ 83,910	\$ 83,910	\$ 83,910	\$ 83,910	\$ 377,595
Grants							
Teaching Grant (WFTE)		\$ 143,546	\$ 287,091	\$ 287,091	\$ 287,091	\$ 287,091	\$ 1,291,910
Support Grant (FTE)		\$ 35,790	\$ 71,580	\$ 71,580	\$ 71,580	\$ 71,580	\$ 322,110
Total grants		\$ 179,336	\$ 358,671	\$ 358,671	\$ 358,671	\$ 358,671	\$ 1,614,020
Additional Funding External	\$ -	\$ 273,920	\$ -	\$ -	\$ -	\$ -	\$ 273,920
Total Revenue	\$ -	\$ 495,211	\$ 442,581	\$ 442,581	\$ 442,581	\$ 442,581	\$ 2,265,535

EXPENSES	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TEACHING							
Tenure Track	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Extended Term Contrats	\$ -	\$ 101,956	\$ 101,956	\$ 101,956	\$ 101,956	\$ 101,956	\$ 509,778
Limited Term Contracts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lecturers	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Course remissions	\$ -	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 12,500	\$ 62,500
Technical support	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Part Time Contracts	\$ -	\$ -	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 100,000
Teacher's Assistants	\$ -	\$ 6,960	\$ 6,960	\$ -	\$ -	\$ -	\$ 13,920
Stipends	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ 260,000	\$ 210,000	\$ 210,000	\$ 210,000	\$ 210,000	\$ 1,100,000
ADMIN STAFF							
Administrative Staff	\$ -	\$ 31,575	\$ 31,575	\$ 31,575	\$ 31,575	\$ 31,575	\$ 157,875
Total Payroll	\$ -	\$ 412,991	\$ 387,991	\$ 381,031	\$ 381,031	\$ 381,031	\$ 1,944,073
OTHER EXPENSES							

LOI Budget Chart

Total Other Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses	\$ -	\$ 412,991	\$ 387,991	\$ 381,031	\$ 381,031	\$ 381,031	\$ 1,944,073
CONCORDIA UNIVERSITY SURPLUS / (DEFICIT)	\$ -	\$ 82,220	\$ 54,590	\$ 61,550	\$ 61,550	\$ 61,550	\$ 321,461

Curriculum Mapping

COMPETENCIES & DESCRIPTORS		The Teacher's Bootcamp	Planning and Implementing	Evaluation For and Of Learning	Fostering Diversity	Inclusive Pedagogy	Portfolio Creation	Second Language Acquisition	Teaching SL Grammar	Teaching SL pronunciation	Teaching SL vocabulary	Teaching Across the Curriculum	Teaching in Early Childhood	Teaching Language Arts	Teaching Mathematics	Teacher's Workshop
FUNDAMENTAL COMPETENCIES																
1	Act as a cultural (knowledge) facilitator when carrying out duties	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
1A	Masters basic knowledge benchmarks and points of understanding with a view to facilitating meaningful, in-depth learning by students.							x	x	x	x	x	x	x	x	x
1B	Build teaching and learning situations that are organized coherently and meaningfully in accordance with the Québec school program, including cultural reference points.		x													
1C	Act as a mediator between the students' culture, their cultural reference points, the school culture, and disciplinary content.				x											
1E	Situate students' learning in a cultural context that connects the past, present, and future.				x											
2	Master the language of instruction	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2A	Spark interest in the language of instruction.							x	x	x						
2B	Promote the language of instruction as a cultural object and a symbolic universe.						x									
2C	Support one's ideas coherently, intelligibly, critically, and respectfully in their communications, both orally and in writing.	x		x	x	x	x					x	x	x	x	x
2D	Adjust their language register based on the interlocutor and the communication intention.		x										x			
2E	Incorporate a diversity of expression forms in teaching and learning situations, both orally and in writing, to support learning.				x								x			
2F	Master the language specifics inherent to their teaching discipline or disciplines.							x	x	x	x					

These indicators draw inspiration from the developmental phases of the 13 professional competencies created by the Steering and Validation Committee for the Mastery levels and Exit profiles Indicators (Comité d'orientation et de validation des indicateurs de niveaux de maîtrise et de profils de sortie). The indicators were endorsed by the Accreditation Committee for Teacher Education Programs (CAPFE) and presented to ADEREQ in November 2023.

Teresa Hernandez Gonzalez was part of the committee and participated in the creation of the report.

AREA 1: Six specialized competencies central to working with and for students															
3	Plan teaching and learning situations														
3A	Develop sequences and teaching and learning situations that take into account the logic of the curriculum, students' prior knowledge, and their preconceptions, with a perspective of planning short-term, medium-term, and long-term learning.		x										x		x
3B	Ensure maximum alignment between the intention behind the training activity, teaching and learning situations, and assessment during and at the end of the activity.			x										x	x
3C	Integrate activities into teaching and learning situations that support the transferability of learning.		x							x	x	x	x	x	
3E	Document pedagogical and didactic choices based on research findings.								x	x	x	x			x
4	Implement teaching and learning situations														
4A	Implement teaching and learning situations that clarify the intended learning outcomes, verify students' preconceptions, draw on their prior knowledge, and align with a logic of continuity in learning.		x											x	
4B	Assess the coherence of the teaching and learning situations implemented in relation to the content and organization of the Québec school program.													x	x
4C	Explicitly outline the approaches and strategies that make tasks stimulating and diverse for students while fostering their autonomy and supporting their engagement.													x	x
5	Evaluate learning														
5A	Design learning assessment tools rooted in the curriculum and taking into account the characteristics and needs of students.			x											x
5B	Explicitly state the purposes of learning assessment to question their teaching planning and, if necessary, modify it accordingly.			x											x
5C	Compare the effectiveness of a variety of means for collecting meaningful and relevant data in assessing students' learning.			x											
5D	Explain the foundations of their decisions in evaluative judgments regarding students' learning, especially their progress.			x						x					
5E	Communicate assessment results, emphasizing students' strengths and challenges, and considering the emotional dimension of assessment.			x											
5F	Regularly provide feedback to students with the aim of supporting their learning, progress, and engagement.			x											x

6	Manage how the class operates	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
6A	Establish a safe and respectful climate with students that fosters the development of living together in diversity.				x												
6B	Organize the functioning of the class group in a way that allows students to continue their development in terms of learning and social and relational skills.		x														
6C	Create an environment that supports students' empowerment and progressive autonomy.				x												
6D	Ensure effective management of the time allocated for teaching and learning, as well as the organization of space and materials.		x														
6E	Implement appropriate interventions based on the observation of signs of demotivation and misunderstanding.					x											
6F	Regulate disruptive behaviors in the conduct of teaching and learning situations.		x														
7	Take into account student diversity	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
7A	Adapt teaching and learning situations based on the needs, abilities, and backgrounds of students.					x		x									
7B	Implement interventions that consider the issues related to inclusive education and cooperative strategies that take into account the diversity of students.				x	x											
7C	Prioritize grouping modalities that consider pedagogical intentions and the differentiated learning needs of students.					x											
7D	Strike a balance between personalized interventions and interventions for the entire class.					x			x	x	x						
7E	Establish complementary relationships with members of the school team.					x											
7F	Implement intervention plans or learning support plans in collaboration with other professionals.					x											
8	Support students' love of learning	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
8A	Give meaning and value to learning by establishing connections with everyday life situations and the cultural reference points of the student.								x	x	x	x	x				
8B	Build teaching and learning situations explicitly anchored in the students' fields of interest.		x										x				
8E	Cultivate positive relationships with students to create optimal conditions for learning.				x									x			

AREA 3: One competency inherent in teachers' professionalism																
11	Commit to own professional development and to the profession	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
11A	Define the actions implemented during their teacher training that contributed to the valorization of the teaching profession.	x					x									x
11B	Explain the evolution of their reflective stance since the beginning of their teacher training.	x					x									x
11C	Determine the plan for continuing education to ensure greater mastery of their skills.	x					x									
11D	Identify the primary contributions of research data to the practices of teachers.						x									x
11E	Justify the rigor of their assessments of the validity of the documentary sources consulted to support their interventions.						x									
11F	Document the contributions of specialized books related to student education in their teacher training journey.						x									
TWO CROSS-CURRICULAR COMPETENCIES																
12	Mobilize digital technologies	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
12B	Utilize digital technology as a means of inclusion and to address diverse needs.			x	x	x		x	x	x	x					
12E	Integrate technological tools or digital platforms based on the purposes of teaching and learning situations to support student learning.		x													
13	Act in accordance with the ethical principles of the profession	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
13A	Document the major ethical issues of the teacher in terms of integrity in the performance of their duties.	x					x									
13C	Argue the changes integrated into their training concerning values and attitudes.	x					x									
13F	Explain the practices adopted in the classroom or with the community that promote the inclusion of students.															x
13G	Adopt inclusive practices to prevent any form of discrimination against students.				x	x										

Course Sequences

YEAR 1

Summer	Fall	Winter
<div>CORE COURSES</div> <div>CLUSTER COURSES</div>	<div> GDTC 500 (1.5 cr.) The Teacher's Bootcamp </div>	<div> GDTC 501 (1.5 cr.) The Teacher's Workshop I Pre: GDTC 500 </div>
	<div> GDTC 503 (3 cr.) Planning and Implementing Learning Situations Concurrently: GDTC 500 </div>	<div> GDTC 504 (3 cr.) Evaluation of and for Learning Pre: GDTC 503 </div>
	<div> GDTC 510 (3 cr.) Teaching Language Arts Concurrently: GDTC 500 </div>	
	<div> OR GDTC 520 (3 cr.) Second Language Acquisition Concurrently: GDTC 500 </div>	<div> GDTC 505 (3 cr.) Fostering Diversity Pre: GDTC 500 </div>

YEAR 2

Summer	Fall	Winter
	<div> GDTC 502 (1.5 cr.) The Teacher's Workshop II Pre: GDTC 501 </div>	<div> GDTC 506 (3 cr.) Inclusive Pedagogy Pre: GDTC 500 </div>
	<div> GDTC 511 (3 cr.) Teaching Mathematics Pre: GDTC 500 </div>	
	<div> OR GDTC 521 (3 cr.) Teaching Second Language Pronunciation Pre: GDTC 520 </div>	<div> GDTC 507 (1.5 cr.) Portfolio Creation Pre: GDTC 505, and 15 cr. completed </div>
	<div> GDTC 512 (3 cr.) Teaching in Early Childhood/Kindergarten Pre: GDTC 500 </div>	<div> GDTC 513 (3 cr.) Teaching Across the Curriculum Pre: GDTC 511 </div>
	<div> OR GDTC 522 (3 cr.) Teaching Second Language Vocabulary Pre: GDTC 520 </div>	<div> OR GDTC 523 (3 cr.) Teaching Second Language Grammar Pre: GDTC 520 </div>

2025		2025		2026		2026		2027		2027		2028	
Winter		Summer		Fall		Winter		Summer		Fall			
CORE COURSES		CLUSTER COURSES		GDTC 500 (1.5 cr.) The Teacher's Bootcamp		GDTC 501 (1.5 cr.) The Teacher's Workshop I Pre: GDTC 500		GDTC 502 (1.5 cr.) The Teacher's Workshop II Pre: GDTC 501		GDTC 506 (3 cr.) Inclusive Pedagogy Pre: GDTC 500			
GDTC 503 (3 cr.) Planning and Implementing Learning Situations Concurrently: GDTC 500		GDTC 504 (3 cr.) Evaluation of and for Learning Pre: GDTC 503		GDTC 505 (3 cr.) Fostering Diversity Pre: GDTC 500		GDTC 511 (3 cr.) Teaching Mathematics Pre: GDTC 500		GDTC 512 (3 cr.) Teaching in Early Childhood/Kindergarten Pre: GDTC 500		GDTC 507 (1.5 cr.) Portfolio Creation Pre: GDTC 505, and 15 cr. completed		GDTC 513 (3 cr.) Teaching Across the Curriculum Pre: GDTC 511	
GDTC 510 (3 cr.) Teaching Language Arts Concurrently: GDTC 500						GDTC 521 (3 cr.) Teaching Second Language Pronunciation Pre: GDTC 520		GDTC 522 (3 cr.) Teaching Second Language Vocabulary Pre: GDTC 520		GDTC 523 (3 cr.) Teaching Second Language Grammar Pre: GDTC 520			
GDTC 520 (3 cr.) Second Language Acquisition Concurrently: GDTC 500													

2025		2026		2026		2027	
YEAR 1		YEAR 1		YEAR 2		YEAR 2	
Summer		Fall		Winter		Summer	
CORE COURSES		CLUSTER COURSES		GDTC 500 (1.5 cr.) The Teacher's Bootcamp		GDTC 501 (1.5 cr.) The Teacher's Workshop I Pre: GDTC 500	
GDTC 503 (3 cr.) Planning and Implementing Learning Situations Concurrently: GDTC 500		GDTC 504 (3 cr.) Evaluation of and for Learning Pre: GDTC 503		GDTC 505 (3 cr.) Fostering Diversity Pre: GDTC 500		GDTC 502 (1.5 cr.) The Teacher's Workshop II Pre: GDTC 501	
GDTC 510 (3 cr.) Teaching Language Arts Concurrently: GDTC 500						GDTC 511 (3 cr.) Teaching Mathematics Pre: GDTC 500	
GDTC 520 (3 cr.) Second Language Acquisition Concurrently: GDTC 500						GDTC 512 (3 cr.) Teaching in Early Childhood/Kindergarten Pre: GDTC 500	
						GDTC 521 (3 cr.) Teaching Second Language Pronunciation Pre: GDTC 520	
						GDTC 522 (3 cr.) Teaching Second Language Vocabulary Pre: GDTC 520	
						GDTC 506 (3 cr.) Inclusive Pedagogy Pre: GDTC 500	
						GDTC 507 (1.5 cr.) Portfolio Creation Pre: GDTC 505, and 15 cr. completed	
						GDTC 513 (3 cr.) Teaching Across the Curriculum Pre: GDTC 511	
						GDTC 523 (3 cr.) Teaching Second Language Grammar Pre: GDTC 520	

2026		2027		2027		2028	
YEAR 1		YEAR 1		YEAR 2		YEAR 2	
Summer		Fall		Winter		Summer	
CORE COURSES		CLUSTER COURSES		GDTC 500 (1.5 cr.) The Teacher's Bootcamp		GDTC 501 (1.5 cr.) The Teacher's Workshop I Pre: GDTC 500	
GDTC 503 (3 cr.) Planning and Implementing Learning Situations Concurrently: GDTC 500		GDTC 504 (3 cr.) Evaluation of and for Learning Pre: GDTC 503		GDTC 505 (3 cr.) Fostering Diversity Pre: GDTC 500		GDTC 502 (1.5 cr.) The Teacher's Workshop II Pre: GDTC 501	
GDTC 510 (3 cr.) Teaching Language Arts Concurrently: GDTC 500						GDTC 511 (3 cr.) Teaching Mathematics Pre: GDTC 500	
GDTC 520 (3 cr.) Second Language Acquisition Concurrently: GDTC 500						GDTC 512 (3 cr.) Teaching in Early Childhood/Kindergarten Pre: GDTC 500	
						GDTC 521 (3 cr.) Teaching Second Language Pronunciation Pre: GDTC 520	
						GDTC 522 (3 cr.) Teaching Second Language Vocabulary Pre: GDTC 520	
						GDTC 506 (3 cr.) Inclusive Pedagogy Pre: GDTC 500	
						GDTC 507 (1.5 cr.) Portfolio Creation Pre: GDTC 505, and 15 cr. completed	
						GDTC 513 (3 cr.) Teaching Across the Curriculum Pre: GDTC 511	
						GDTC 523 (3 cr.) Teaching Second Language Grammar Pre: GDTC 520	

Evaluation Templates

TEMPLATE EVALUATION TOOL – STARTING LINE

CONTEXTUALIZATION			
[Prompting questions to help gather all relevant information about the context]			
EXPLORATION			
What is your overall understanding of the descriptors attached to this course?			
How could those descriptors manifest in your teaching?			
STRONGER DESCRIPTORS			
	Enablers	Blockers	Further development
WEAKER DESCRIPTORS			
	Enablers	Blockers	Further development
TARGET SETTING			
[SMART target]			
RATIONALE			
- Why is this goal important?			
- What will the impact be?			
ACTION PLAN			
Activities/Steps	Timeline	Resources	Check ins (form and medium)

TEMPLATE EVALUATION TOOL – “CHECK IN”

TARGET			
[SMART target previously selected]			
RATIONALE			
- Why is this goal important?			
- What will the impact be?			
ACTION PLAN ATTEMPTED			
Activities/Steps	Timeline	Resources	Check ins (form and medium)
REFLECTION			
What happened?			
Why did it happen?			
Pedagogical/Theoretical knowledge supporting the analysis.			
What could be done differently?			
Pedagogical/Theoretical knowledge supporting the hypothesis.			
NEW ACTION PLAN			
Activities/Steps	Timeline	Resources	Check ins (form and medium)

TEMPLATE EVALUATION TOOL – “FINAL REPORT”

TARGET			
[SMART target previously selected]			
RATIONALE			
- Why is this goal important?			
- What will the impact be?			
ACTION PLAN ATTEMPTED			
Activities/Steps	Timeline	Resources	Check ins (form and medium)
REFLECTION			
What happened?			
Why did it happen?			
Pedagogical/Theoretical knowledge supporting the analysis.			
What could be done differently?			
Pedagogical/Theoretical knowledge supporting the hypothesis.			
EVIDENCE OF DEVELOPMENT			
Descriptor	How did it manifest?	Type of evidence	Link to piece of evidence

Curriculum Vitae

for

Saul Carliner, Ph.D., CTD

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EXPERIENCE AND EDUCATION

Academic Experience

- Concordia University. Montreal, Quebec. Chair, Department of Education (since 2022). Professor (since 2016.) Director, Graduate Programs in Educational Technology (2018-2022). Director, Graduate Certificate in Teaching in Higher and Continuing Education (formerly Graduate Certificate in University Teaching) (2018-2022). Interim Chair, Department of Education, (2016-2017). Associate Professor (2007-2016). Provost's Fellow for Digital Learning (2012-2016). Director, Education Doctoral Program (2011-2016). Assistant Professor (2003-2007).
- University of International Business and Economics. Beijing, China. Instructor, International Summer School. Taught course on Integrated Corporate Communication. July 2016 through July 2019.
- City University of Hong Kong. Hong Kong. 2001, 2002-2003. Department of English and Communication. Visiting Assistant Professor.
- Bentley College. Waltham, Massachusetts. 1999-2002. Assistant Professor, Information Design and Corporate Communication Department.
- University of Minnesota. St. Paul, Minnesota. 1998-1999. Assistant Professor and Coordinator, Partnership Program (Distance) in Technical Communication. Department of Rhetoric. Joint appointment with the Department of English, University of Minnesota – Crookston. (1998-1999). Part-time instructor. (1998.)
- Southern Polytechnic State University. Marietta, Georgia. 1992-1996. Assistant Professor of Technical Communication. Department of Humanities and Technical Communication.

Professional Experience

- Carliner & Company. 1992-1995 and since 1998. Managing Partner. Clients include Alltel Wireless, Axcan Pharma, Boston Scientific, Canada School of Public Service, Chubb Insurance, Children's Hospital Corporation of America, Equitas – Canadian Human Rights Education Foundation, Hermes Softlab, Jewish General Hospital, Lowe's, Microsoft, Montreal Holocaust Memorial Centre, PwC, ST Microelectronics, Turkish Management Centre, Weather Channel, and several state and US and Canadian federal agencies.
- Fredrickson Communications, Inc. Executive Vice-President. Minneapolis, Minnesota. 1995-1998.

- IBM Corporation. 1980-1992 (Advisory Marketing Programs Administrator (Customer Education), Education Development Administrator (Technical Education) and Information Developer (System Products Division))

Education and Certification

- Ph.D. Instructional Technology. Georgia State University. Dissertation: "Every Object Tells a Story: A Grounded Model of Design for Object-Based Learning in Museums.
- M.Ag. Technical Communication. University of Minnesota.
- B.A. Economics, Professional Writing, and Public Policy and Management, minor in Administration and Management Science. Carnegie Mellon University.
- Certified Training and Development Professional, awarded by the Canadian Society for Training and Development.
- Certified Facilitator of Training, awarded by Lakewood Media.

RESEARCH FUNDING

External Research Grants

- Spink, E., **Carliner, S. (co-investigator)**, Kovary, G., Gillis, L., Yap, R., & Pound, M. Building Our Capacity to Develop Skills for Success in Canada's Workforce. Employment and Skills Development Canada, Skills for Success Program – Research and Innovation Stream. \$CDN 585,690.
- **Carliner, S.** (primary investigator), Piechowiak (co-investigator), M. Lassana Mané, M.L, & Franzoni, M. (partners). Analyse des programmes d'accueil des talents issus de l'immigration par les PME manufacturières québécoises en région. Future Skills Centre. \$CDN 111,183.
- **Carliner, S.** (primary investigator) & Cucinelli, G (co-investigator). Informal Learning for Current and Longer-Term Employability. Social Sciences and Humanities Research Council. 2020-2023. \$99,118
\$54,000 in additional funding for the project from the Department of National Defence Research Initiative.
- Concordia University and Marianopolis College. (2019.) Au bout des doigts: une approche différente au développement professionnel de l'enseignement et de l'apprentissage dans les universités et les cégeps, troisième et dernière année (Translation: – 'Bring It to Them: A New Approach to Professional Development on Teaching and Learning for Universities and Cégeps' – Third and Final Year) L'Entente Canada-Québec program of the Ministère de l'Éducation et de l'Enseignement Supérieur. (Primary investigator for an institutional grant.) \$CDN 68,257.
- Concordia University and Marianopolis College. (2018.) Au bout des doigts: une approche différente au développement professionnel de l'enseignement et de l'apprentissage dans les universités et les cégeps, année 2 (Translation: – 'Bring It to Them: A New Approach to Professional Development on Teaching and Learning for Universities and Cégeps' – Year 2) L'Entente Canada-Québec program of the Ministère de l'Éducation et de l'Enseignement Supérieur. (Primary investigator for an institutional grant.) \$CDN 75,950.

- Concordia University and Marianopolis College. (2017.) *Au bout des doigts: une approche différente au développement professionnel de l'enseignement et de l'apprentissage dans les universités et les cégeps* (Translation: - 'Bring It to Them: A New Approach to Professional Development on Teaching and Learning for Universities and Cegeps') L'Entente Canada-Quebec program of the Ministère de l'Éducation et de l'Enseignement Supérieur. (Primary investigator for an institutional grant.) \$CDN 57,899.
- Davidson, A.L., Cucinelli, G., **Carliner, S.**, Light, E. & Oostveen, R. (2016.) Exploring the potential of the digital "maker:" Movement for authentic learning. Social Sciences and Humanities Research Council of Canada Insight Development Grant. \$CDN \$62,289
- **Carliner, S.**, Davidson, A. L. & Devey, P. (2010.) Survey of perceptions of e-books in higher education. KnowledgeOne. \$CDN 5909.
- **Carliner, S.** (2005.) A genre-based approach to best practices in online communication for the workplace. Social Sciences and Humanities Research Council of Canada. \$CDN \$58,138.
- Boswood, T., **Carliner, S.** and Davison, R. (2003.) *Brochureware: Design, copywriting and usability issues in an emerging genre of online communication.* Hong Kong University Grants Council. \$HK 190,495.
- **Carliner, S.** (2001.) What do we manage: a survey of the management portfolios of larger technical communication departments. Society for Technical Communication Research Grant. \$US 9960.

Internal Research Grants

- **Carliner, S.** (2019.) Open Access Textbook on Educational Communication. Concordia Open Educational Resources Grants \$5,000.
- **Carliner, S.** & Davidson, A-L. (2017.) The Next Generation Education Tour. Learning from Others Fund, Faculty of Arts and Science. \$2,000.
- Hebblewaite, S., Reilly, R., Yuen, F., Sawchuk, K., Dyer, L., Timm-Botos, J., **Carliner, S.**, Paterson, S., & Poteete, A. Qualitative Research Working Group. (2012.) CISSC Interdisciplinary Working Group. \$1,500.
- **Carliner, S.** (2009.) What Are Customers' Perceptions of Training and What Drives Those Perceptions. Concordia University Seed Funding Program (Individual Stream.) \$6,998.
- **Carliner, S.** (2008.) ETEC@40: The Impact of Educational Technology Research and Theory in Practice. Concordia University Faculty of Arts and Science Aid to Research Related Events, Publication, Exhibition and Dissemination Activities. \$1,000.
- **Carliner, S.** (2004.) We Are What We Measure: Towards Quality Metrics for Learning and Communication Products Used in the Workplace. Concordia University Faculty of Arts and Science General Research Fund. \$5,000.
- **Carliner, S.** (2001.) Bentley College. Case Study of an Information Design and Development Project. Summer Research Grant. \$3,000. Completion: September 15, 2001.
- **Carliner, S.** (2001.) Bentley College. Travel Grant. \$1,120. Completion: August 10, 2001.

External Research Contracts

- **Carliner, S.** and Aslan, O. (2020-2022.) Kehilla Montréal Housing Project: Assessing the Impact. Kehilla Montréal.
- **Carliner, S.** (2019-2022.) Evaluation of the Passport to Jewish Life and the Passport Fellows Program. Montreal Federation/CJA.
- **Carliner, S.** (2017, 2016, 2015, 2014, 2013). Research Director, *Lakewood Media* (publisher of *Training* magazine and producer of the Training and Online Learning Conferences).
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Presented virtually. February 17, 2021.

- **Carliner, S.** (2020.) Partnering with clients: The development of a new competency area for Learning and Development professionals and the new perspectives it opens. Association for Educational Communications and Technology Virtual Conference. November 6, 2020.
- **Carliner, S.** (2020.) Book pitch for *Communicating Instructional and Informational Content* and *Communicating Instructional and Informational Content with Style*. Association for Educational Communications and Technology Virtual Conference. November 5, 2020.
- **Carliner, S.,** Cucinelli, G., & Chen, Y. (2020.) Where are they now? A study of alumni of an educational technology program. Association for Educational Communications and Technology Virtual Conference. November 4, 2020.
- **Carliner, S.** (2020.) Designing curricula: The development of a new competency area for Learning and Development professionals and the opportunities that opens. Association for Educational Communications and Technology Virtual Conference. November 3, 2020.
- **Carliner, S.** (2020.) Book pitch for *An Overview of Training and Development: Why Training Matters*. Association for Educational Communications and Technology Virtual Conference. November 2, 2020.
- **Carliner, S.** & Driscoll, M. (2020.) Everything old is new again. PROCOMM 2020 Virtual Conference. IEEE Professional Communication Society. July 21, 2020.
- **Carliner, S.** (2020.) In the middle: Managing middle careers in an era of disruption. Virtual Summit 2020. Society for Technical Communication. May 22, 2020.
- **Carliner, S.** (2020.) Business essentials: The five facts every professional should know about the technical communication business. Virtual Summit 2020. Society for Technical Communication. May 21, 2020.
- **Carliner, S.** (2020.) Competency models 101: What are they? How do you develop them and validate them? How do HRD professionals apply them? Academy of Human Resource Development Research Conference in the Americas. Atlanta, Georgia. February 29, 2020.
- **Carliner, S.** (2019.) What is Learning Experience Design (and does adopting it require you to leave ADDIE and SAM behind?) Institute for Performance and Learning Annual Conference. Toronto, Ontario. October 10, 2019.
- **Carliner, S.** & Chen, Y. (2019.) What relationships exist between learning experience design and instructional design? XD 2019 : The International Conference on Experience Design, Innovation , and Entrepreneurship. Griffith University, Mount Gravatt, Australia, August 16, 2019.
- Albert, L., **Carliner, S.** & Lopez, M. (2019.) Plagiarism and Other Code Violations: Drawing Back the Curtain. 2019 SALTISE Conference. Montreal, QC. June 4, 2019.
- Price, D. W. & **Carliner, S.** (2019.) What drives faculty, what holds them back, and how do they cope. 2019 SALTISE Conference. Montreal, QC. June 3, 2019.
- Lopez, M., Jones, D., Rosenfield, A., Ozyonum, E., Bekkouche, N., Price, D. & **Carliner, S.** (2019.) Applying the scholarship of teaching and learning in classroom practice. 2019 SALTISE Conference. Montreal, QC. June 3, 2019.

- Rosenfield, A., **Carliner, S.** & Lopez, M. (2019.) Essay exams: An integrative review. 2019 Canadian Society for the Study of Higher Education Conference. Vancouver, BC, June 4, 2019.
- Ozyonum, E., **Carliner, S.** & Lopez, M. (2019.) Internationalization of higher education and prior knowledge of students: A review of recent literature and an integrative configuration. 2019 Canadian Society for the Study of Higher Education Conference. Vancouver, BC, June 2, 2019.
- **Carliner, S.** & Chen, Y. (2019.) Technical Communication in Canada: Insights from the 2018 census of the field. Concordia University. 2019 Canadian Association for the Study of Discourse and Writing Conference. Vancouver, BC, June 1, 2019.
- **Carliner, S.** (2019.) Marketing your technical communication products and services internally and externally. 2019 Society for Technical Communication Summit. Denver, CO: May 7, 2019.
- Bakir, I. & **Carliner, S.** (2019.) Critical success factors in internships: A preliminary integrative literature review. 2019 Academy of Human Resource Development Research Conference in the Americas. Louisville, KY. February 17, 2019.
- **Carliner, S.** (2018.) Bring it to them: An EPSS for faculty development. 2018 SALTISE Conference. Montreal, QC. May 31, 2018.
- **Carliner, S.** (2018.) Preparing to advise mid- and late-career clients in the age of Industry 4.0, National Jewish Human Service Agencies Conference, Chicago, IL: April 29-May1, 2018.
- **Carliner, S.,** Driscoll, M. & Thayer, Y. (2018.) SkilledUP: How HRD professionals can prepare organizations for the skills needed by Industry 4.0, Academy of Human Resource Development Research Conference in the Americas, Richmond, VA, February 17, 2018.
- **Carliner, S.** (2017.) Content strategy? Architecture? Designing complex communication campaigns, TCWorld 2017, tekomp, Stuttgart, Germany, October 25, 2017.
- **Carliner, S.** (2017.) Writing test questions, SALTISE 2017, Montreal, QC, June 6, 2017.
- **Carliner, S.** (2016.) The influence of values on competency models in the profession of Training and Development, Competence2016, University of Wageningen, Wageningen, NL, October 19-21, 2016.
- **Carliner, S.** (2016.) Silver, gold and bronze: How much effort should you really invest in an ID project? 2016 Association for Talent Development International Conference and Exposition, Denver, CO: May 24-27, 2016.
- Boettger, R., Friess, E., & **Carliner, S.** (2015.) Update to who says what to whom? Assessing the alignment of content and audience between scholarly and professional publications in Technical Communication (1996-2013). ProComm 2015, IEEE Professional Communication Society, Limerick, Ireland, July 12-15, 2015.
- **Carliner, S.,** Chen, Y., di Guiseppi, M., Garcia-Martinez, S. & Davidson, A. L. (2015.) Perceptions and e-textbooks: Insights into challenges faced by publishers, ProComm 2015, IEEE Professional Communication Society, Limerick, Ireland, July 12-15, 2015.
- **Carliner, S.** (2015.) Moving from the classroom online: An interim report on strategies for digitizing the curriculum. ED-MEDIA 2015. Association for the Advancement of Computing in Education. Montreal, QC. June 22-24, 2015.
- Price, D. & **Carliner, S.** (2015.) How constructivist is that? The mental models of

enterprise systems and their impacts on learning designs. ED-MEDIA 2015. Association for the Advancement of Computing in Education. Montreal, QC. June 22-24, 2015.

- **Carliner, S.** (2015.) Flipping an introductory, graduate-level instructional design course: A teaching case. ED-MEDIA 2015. Association for the Advancement of Computing in Education. Montreal, QC. June 22-24, 2015.
- **Carliner, S.** (2015.) Evaluating Informal Learning. 2015 Symposium. Canadian Society for Training and Development. Vancouver, BC. June 12, 2015.
- **Carliner, S.** (2015.) A typology of conference programs. 2015. Canadian Association for the Study of Adult Education Conference. Montreal, QC. June 9-11, 2015.
- Bernard, C. & **Carliner, S.** (2015.) The job lifecycle framework of informal learning. Canadian Association for the Study of Adult Education Conference. Montreal, QC. June 9-11, 2015.
- Driscoll, M. & **Carliner, S.** (2015.) Training and Development in hopeful but challenging times: An analysis of material published in *T&D* in the 1970s and 1980s. Canadian Association for the Study of Adult Education Conference. Montreal, QC. June 9-11, 2015.
- **Carliner, S.** (2015.) Strengthening Internships: Applying the Advice of Former Interns. 2015 Association for Talent Development International Conference and Exposition. Orlando, FL. May 18, 2015.
- **Carliner, S.** (2015.) Writing application articles: How to translate research for practicing professionals. 015 Academy of Human Resource Development Research Conference in the Americas. St. Louis, MO. February 20, 2015.
- **Carliner, S.** (2014.) 12 ways to use your enterprise system to promote informal learning. 2014 Canadian Society for Training and Development Conference, Toronto, ON: November 14, 2014.
- **Carliner, S.**, Boettger, R. K., & Friess, E. (2014.) How do we adapt the traditional research article so it's relevant to the practicing professional? 2014 International Professional Communication Conference. IEEE Professional Communication Society. Pittsburgh, PA. October 14, 2013.
- Dysart-Gale, D. & **Carliner, S.** (2014.) Teaching Writing Online: Two Case Studies—Deborah Dysart-Gale, Concordia University, Saul Carliner, Concordia University. 2014 International Professional Communication Conference. IEEE Professional Communication Society. Pittsburgh, PA. October 13, 2013.
- Fancher, L., **Carliner, S.**, & Hansen, C. D. (2013.) The cultural context of HRD within North America: Are the US and Canada alike? 15th Annual Conference on Human Resource Development Research and Practice Across Europe. Edinburgh Napier University, Edinburgh, Scotland, June 4-6, 2014.
- Graves, R., Graves, H., Smart, G., Williams, T., Hyland, T., Hotson, B., & **Carliner, S.** (2014.) Writing for publication: A workshop on academic writing. Fifth Annual Conference of the Canadian Association for the Study of Discourse and Writing, Ste-Catherine's, ON, Brock University, May 25, 2014.
- **Carliner, S.**, Garcia-Martinez, S., DiGiuseppe, M, Davidson, A. L., Desjardins, F., & Devey, P. (2014.) Perceptions of e-books among CEGEP students and faculty. Fifth Annual Conference of the Canadian Association for the Study of Discourse and Writing, Ste-Catherine's, ON, Brock University, May 25, 2014.

- **Carliner, S.** (2013.) What does certification mean to academic programs in Professional and Technical Communication? 2013 International Professional Communication Conference. IEEE Professional Communication Society. Vancouver, BC. July 16, 2013.
- Davidson, A.L. & **Carliner, S.** (2013.) Characteristics of effective e-textbooks: Lessons from the literature. 2013 International Professional Communication Conference. IEEE Professional Communication Society. Vancouver, BC. July 16, 2013.
- Price, D. W., **Carliner, S.**, Devey, P., & Cerna, N. (2013.) Implementing an online undergraduate course in educational writing. 2013 International Professional Communication Conference. IEEE Professional Communication Society. Vancouver, BC. July 16, 2013.
- **Carliner, S.** (2013.) Promoting practice: Preparing a case study or tutorial for the *IEEE Transactions on Professional Communication*. 2013 International Professional Communication Conference. IEEE Professional Communication Society. Vancouver, BC. July 15, 2013.
- Coppola, N., & **Carliner, S.** (2013.) Resonance or misalignment: A Study of the academic-practitioner border in the Body of Knowledge for Technical Communication. 2013 International Professional Communication Conference. IEEE Professional Communication Society. Vancouver, BC. July 15, 2013.
- Kon Kam King, J., Cooper, A. & **Carliner, S.** (2013.) Planting the seeds of sustainability: How evaluation programs can help programs take root. Community Foundations of Canada Conference. Winnipeg, MB. June 6, 2013.
- **Carliner, S.** (2013.) 12 ways to use your enterprise system to promote informal learning. Canadian Society for Training and Development Spring Symposium. Calgary, AB. May 31, 2013
- **Carliner, S.** (2013). Evaluating informal learning. American Society for Training and Development International Conference and Exposition. Dallas, TX. May 22, 2013.
- Bliel, N., Johnson, T., & **Carliner, S.** (2013.) User assistance, TechComm, and Learning. Technical Communication Summit. Society for Technical Communication. Atlanta, GA. May 5-8, 2013.
- **Carliner, S.** & Coppola, N. (2013.) State of the research in Technical Communication. Association of Teachers of Technical Writing Conference. Las Vegas, NV. March 20, 2013.
- **Carliner, S.**, Castonguay, C., Ribeiro, O., Sabri, H., Saylor, C., Sheepy, E., & Valle, A. (2013.) What is the job of the performance consultant? An analysis of job descriptions. Academy of Human Resource Development Research Conference in the Americas. Arlington, VA. February 23, 2013.
- **Carliner, S.** (2013.) A model for measuring and evaluating informal learning. Academy of Human Resource Development Research Conference in the Americas. Arlington, VA. February 22, 2013.
- **Carliner, S.** (2012.) Portfolios and certification: Two frameworks for recognizing informal learning. Online Educa 2012. Berlin, Germany. November 30, 2012.
- **Carliner, S.** (2012.) Rethinking group work: Maybe our assumptions and expectations are wrong. 2012 Society for Teaching and Learning in Higher Education Conference. Montreal, QC. June 20, 2012.

- **Carliner, S.** (2011.) Workshop in conducting integrative literature reviews. IEEE Professional Communication Society. Cincinnati, OH. October 17-19, 2011.
- **Carliner, S.** (2011.) A taxonomy of technology: A tool for preparing students for internal communications contexts of organizations. IEEE Professional Communication Society. Cincinnati, OH. October 17-19, 2011.
- Coppola, N. & **Carliner, S.** (2011) Is our peer-reviewed literature sustainable? International Professional Communication Conference (IPCC) 2011. IEEE Professional Communication Society. Cincinnati, OH. October 17-19, 2011
- **Carliner, S.** & Bernard, C. (2011.) A qualitative study of the perceptions of workplace learning professionals. Honouring CASAE/ACÉÉA past, present, and future: Canadian Association for the Study of Adult Education - Adult Education Research Council Joint Conference. Toronto, ON: June 9, 2011.
- **Carliner, S.** (2011.) Informal learning and you: 10 issues and technologies to consider. 2011 American Society for Training and Development International Conference and Exposition. Orlando, FL: May 22-25, 2011.
- Conklin, J., Hayhoe, G., De Jong, M., Hart, H. & **Carliner, S.** (2011.) Narratives over numbers: Why qualitative research is essential. TechComm Summit 2011, the 58th Annual Conference of the Society for Technical Communication. Sacramento, CA: May 15-18, 2011.
- Coppola, N. & **Carliner, S.** (2011.) An analysis of the contents of 5 journals in professional and technical communication: 2005 through 2010. TechComm Summit 2011, the 58th Annual Conference of the Society for Technical Communication. Sacramento, CA: May 15-18, 2011.
- **Carliner, S.** (2011.) Bridging research and practice: An interim report on 5 Pilot projects. Academy of Human Resource Development Research Conference in the Americas. Schaumburg, IL: February 25, 2011.
- **Carliner, S.** (2011.) Certification and the branding of HRD. Academy of Human Resource Development Research Conference in the Americas. Schaumburg, IL: February 25, 2011.
- **Carliner, S.** & Bernard, C. (2011.) If we're doing such a great job of Providing HRD services, are we feeling the 'love'? An integrative review of literature on the perceptions of HRD. Academy of Human Resource Development Research Conference in the Americas. Schaumburg, IL: February 25, 2011.
- Davidson, A. L. & **Carliner, S.** (2010.) A proposed research methodology for researching ubiquitous learning technologies. Ubiquitous Learning: An International Conference 10. Common Ground Publishing. Vancouver, BC, December 10, 2010.
- **Carliner, S.** (2010.) So what do they think? Results of a qualitative study of the perceptions of training. Association for Educational Communications and Technology Annual Conference. Anaheim, CA. October 30, 2010.
- **Carliner, S.** (2010.) Beyond project management: Managing the business of educational technology. Association for Educational Communications and Technology Annual Conference. Anaheim, CA. October 29, 2010.
- **Carliner, S.** (2010.) Lessons for structuring asynchronous tutorials from the design of museum exhibits. 2010 Association for Educational Communications and Technology Annual Conference. Anaheim, CA. October 29, 2010.

- **Carliner, S.** & Davidson, A. L. (2010.) Theory versus reality: Redesigning the introductory course on Instructional Design - Human Performance Technology to address student shortcomings. Association for Educational Communications and Technology Annual Conference. Anaheim, CA. October 28, 2010.
- **Carliner, S.** (2010.) e-Books: A means of enhancing community or increasing isolation among students? Constructions of conflict and peace in/by textbooks and educational media, a mini-conference of the International Association for Research on Textbooks and Educational Media. Montreal, QC, August 23, 2010.
- **Carliner, S.** (2010.) Crossing occupational cultures. International Professional Communication Conference. IEEE Professional Communication Society. Enschede. The Netherlands. July 7, 2010.
- **Carliner, S.** (2010.) Instructional design and technical communication: A match Made in Heaven or George and Martha? (Two Fields in Contrast). Council of Programs in Scientific and Technical Communication – Association of Teachers of Technical Writing Educator’s Roundtable. Enschede. The Netherlands. July 6, 2010.
- **Carliner, S.** (2010.) The possible impacts of e-books on learning: A systemic analysis. ED-MEDIA 2010. Association for the Advancement of Computers in Education. Toronto, ON: June 29-July 1, 2010.
- **Carliner, S.** (2010.) Developing the business case for a major e-learning courseware or infrastructure project. ED-MEDIA 2010. Association for the Advancement of Computers in Education. Toronto, ON: June 29-July 1, 2010.
- **Carliner, S.** (2010.) Two applications of learning objects: An analysis using the Unified Theory of Acceptance and Use of Technology. ED-MEDIA 2010. Association for the Advancement of Computers in Education. Toronto, ON: June 29-July 1, 2010.
- **Carliner, S.** (2010.) Powered by Powerpoint: A workshop in designing webcasts and rapid e-learning segments. Canadian Association for the Study of Discourse and Writing Annual Conference. Montreal, QC: May 31, 2010.
- **Carliner, S.** (2010.) e-Books going mainstream: Four possible ways that e-books might affect the teaching of professional writing. Canadian Association for the Study of Discourse and Writing Annual Conference. Montreal, QC: May 31, 2010.
- **Carliner, S.** (2010.) Enterprise learning technology and the work of training and development professionals. 2010 Canadian Association for the Study of Adult Education Annual Conference. Montreal, QC: May 31, 2010.
- **Carliner, S.** (2010.) Conducting research across occupational cultures: Lessons from the field. 2010 Canadian Association for the Study of Adult Education Annual Conference. Montreal, QC: May 30, 2010.
- **Carliner, S.** (2010.) A taxonomy of technology: A tool for preparing students for internal communications context of organizations. Canadian Association for the Study of Discourse and Writing Annual Conference. Montreal, QC: May 29, 2010.
- **Carliner, S.** (2010.) Possible impacts of the new popularity of e-books on higher education. INTED 2010. International Association for Technology, Education and Development. Valencia, Spain. March 8-10, 2010.
- **Carliner, S.** (2010.) Teaching writing in the professions online: A case study. INTED 2010. International Association for Technology, Education and Development. Valencia, Spain. March 8-10, 2010.
- **Carliner, S.** (2009.) The value of technical and professional communication: What

managers track, what managers report. Canadian Association for the Study of Discourse and Writing Conference. May 25, 2009. Ottawa, ON.

- **Carliner, S.** (2009.) What's unique about frequently asked questions, guided tours, and help: Results of an in-depth, multi-modal study of online materials. Canadian Association for the Study of Discourse and Writing Conference. May 25, 2009. Ottawa, ON.
- **Carliner, S.** (2009.) Maybe you shouldn't do that! 20 research-validated practices for designing effective e-learning. Canadian Society for Training and Development Spring Symposium. Halifax, NS. May 22, 2009.
- **Carliner, S.** (2008.) Managing and organising e-learning systems. Online Educa. Berlin. December 5, 2008.
- **Carliner, S.** (2008.) What museums can teach us about usable design: An interactive experience. 2008 Usability Professionals Association Conference. Baltimore, MD. June 17, 2008.
- **Carliner, S.,** Araki, M., Ibrahim, A., & Shaikh, K. (2008.) Guided tours: An in-depth, multi-modal study of online materials intended for informal learning in the workplace. Academy of Human Resource Development Annual Research Conference. Panama City, FL. February 22, 2008.
- **Carliner, S.** & Van Barneveld, A. (2008.) Author biases in writing about the need to demonstrate the effectiveness of training. Academy of Human Resource Development Annual Research Conference. Panama City, FL. February 22, 2008.
- **Aslan, O. & Carliner, S.** (2007.) Design models and their implication for interface design of children's educational software. E-Learn 2007. Association for the Advancement of Computers. Quebec City, QC. October 18, 2007.
- **Carliner, S.** (2007.) What museums can teach trainers about informal learning: An interactive experience. 2007 American Society for Training and Development International Conference and Exposition. Atlanta, GA. June 4, 2007.
- **Carliner, S.** (2007.) Creative e-learning. Society for Technical Communication 54th Annual Conference. Minneapolis, MN. May 14, 2007.
- **Carliner, S.** and Qayyum, A. (2007.) Evaluating informal learning. 2007 Canadian Society for Training and Development Annual Symposium: Assessment, measurement and evaluation. Montreal, QC. May 4, 2007.
- **Carliner, S.,** Ally, M., Zhao, N., & Johnston, L. (2007.) The limitations of research in performance improvement: Evidence, implications, and suggestions. Academy of Human Resource Development International Research Conference. Indianapolis, In. March 3, 2007.
- **Carliner, S.,** Araki, M., Ibrahim, A., & Samuel-George, A. (2007.) Frequently asked questions: An in-depth, multi-modal study of online materials intended for informal learning in the workplace. Academy of Human Resource Development International Research Conference. Indianapolis, In. March 3, 2007.
- **Carliner, S.** Qayyum, A., Sanchez-Lozano, J.C., & Macmillan, S. (2007.) The value of training: What training managers track, what training managers report. Academy of Human Resource Development International Research Conference. Indianapolis, In. March 3, 2007.
- **Carliner, S.** (2007.) Lessons for the design and assessment of informal learning for the workplace from the Indiana State Museum: An experiential activity.

- Academy of Human Resource Development International Research Conference. Indianapolis, In. March 2, 2007.
- **Carliner, S.** (2006.) Inconspicuous consumption: Lessons for web design from malls and retail design. Canadian Society for Training and Development Knowledge Exchange. Toronto, ONT. November 8, 2006.
- **Carliner, S.** (2006.) Foundations of a micro-genre: Interim results of a detailed, multi-modal study of Frequently Asked Questions. Canadian Association of Teachers of Technical Writing Conference. Canadian Congress of the Humanities and Social Sciences. North York, ONT. May 30, 2006.
- **Carliner, S.** (2006.) The limitations of research in performance improvement: Evidence, implications, and suggestions. European Conference on Human Resource Development. Academy for Human Resource Development. Tilburg, the Netherlands. May 24, 2006.
- **Carliner, S.** (2006.) Productivity and effectiveness: An exploratory study of what managers actually track and report. European Conference on Human Resource Development. Academy for Human Resource Development. Tilburg, the Netherlands. May 23, 2006.
- **Carliner, S.** (2006.) Storytelling as a design device. European Conference on Human Resource Development. Academy for Human Resource Development. Tilburg, the Netherlands. May 23, 2006.
- **Carliner, S.** (2006.) Lessons learned from museums for designing informal learning. European Conference on Human Resource Development. Academy for Human Resource Development. Tilburg, the Netherlands. May 22, 2006.
- Driscoll, M., & **Carliner, S.** (2006.) Repurposing content: How to make good material work again and again. TechKnowledge 2006. America Society for Training and Development. Denver, CO. January 30, 2006.
- **Carliner, S.** (2005.) Informal learning: What it is and why many consider it the next frontier of learning. Annual Knowledge Exchange. Canadian Society for Training and Development. Toronto, ONT. November 8, 2005.
- **Carliner, S.** (2005.) An overview of strategic planning for e-learning. Strategic planning for e-learning web conference. ALEGRO E-Learning Conference. Ottawa Council on Research and Innovation. September 14, 2005.
- **Carliner, S.** (2005.) In defense of the lecture. ED-MEDIA 2005. Association for the Advancement of Computing in Education. Montreal, QC. July 1, 2005.
- **Carliner, S.** (2005.) What do we manage—and how do we assess It? Results of an exploratory study with executives in training, technical communication, and corporate communication. ED-MEDIA 2005. Association for the Advancement of Computing in Education. Montreal, QC. June 29, 2005.
- **Carliner, S.** (2005.) Performance support approach to professional development for teachers who use e-portfolios. Pan American E-Portfolio Conference. Learning Innovations Forum: Vancouver, BC. April 18, 2005.
- **Carliner, S.** (2005.) Inconspicuous consumption: Lessons for web design from malls and retail design. International Society for Performance Improvement Annual Conference. Vancouver, BC. April 15, 2005.
- **Carliner, S.** (2005.) A comparison of productivity and effectiveness metrics among training, communication, and technical communication departments.

International Society for Performance Improvement Annual Conference. Vancouver, BC. April 14, 2005.

- **Carliner, S.** (2005.) A matter of values: The relationship of value systems and evaluation. International Society for Performance Improvement Annual Conference. Vancouver, BC. April 13, 2005.
- **Carliner, S.** (2005.) What do we manage—and how do we assess it? Results of an exploratory study with executives in training, technical communication, and corporate communication. Association of Teachers of Technical Writing Conference: San Francisco, CA. March 16, 2005.
- **Carliner, S.** (2005.) Repurposing content: How to make good material work again and again. Canadian Society for Training and Development Annual Conference. Toronto, Ontario. November 3, 2004.
Carliner, S. (2004.) Business models for training and performance improvement departments. Canadian Society for Training and Development Annual Conference. Toronto, Ontario. November 3, 2004.
- **Carliner, S.** (2004.) Demonstrating effectiveness: The link between business objectives, business cases, and ROI. International Society for Performance Improvement Conference. Tampa, FL. April 22, 2004.
Driscoll, M. & **Carliner, S.** (2004.) Repurposing content: How to make good material work again and again. American Society for Training and Development International Conference and Exposition. Washington, DC. May 25, 2004.
- **Carliner, S.** (2004.) Storytelling as an instructional design technique. International Society for Performance Improvement Conference. Tampa, FL. April 23, 2004.
- **Carliner, S.** (2004.) Demonstrating effectiveness: The link between business objectives, business cases, and ROI. International Society for Performance Improvement Conference. Tampa, FL. April 22, 2004.
- **Carliner, S.** (2004.) We are what we measure: Metrics for informal learning. International Society for Performance Improvement Conference. Tampa, FL. April 22, 2004.
- **Carliner, S.** (2004.) What would you do? Ethical dilemmas in HPT practice. International Society for Performance Improvement Conference. Tampa, FL. April 21, 2004.
Sakson, S. and **Carliner, S.** (2003.) The “just one thing” mid-career makeover. 50th Society for Technical Communication Annual Conference. Dallas, TX: May 21, 2003.
Carliner, S. (2003.) We are what we manage: the portfolios of technical communication manager s. 50th Society for Technical Communication Annual Conference. Dallas, TX. May 21, 2003.
- **Carliner, S.** (2003.) Storytelling as an information design technique. 50th Society for Technical Communication Annual Conference. Dallas, TX: May 21, 2003.
- **Carliner, S.** (2003.) It doesn't always match what we've been teaching: a study of management practice in larger professional technical communication departments. 2003 Association of Teachers of Technical Writing Annual Conference. New York, NY. March 19, 2003.
- **Carliner, S.** (2002.) Business models for training and performance improvement departments. American Society for Training and Development Conference. New Orleans, LA. June 3, 2002.

- **Carliner, S.** (2002.) Business models for training and performance improvement departments. International Society for Performance Improvement Conference. Dallas, TX. April 26, 2002.
- **Carliner, S.** (2002.) Information design: what it is and what it means to instructional designers. International Society for Performance Improvement Conference. Dallas, TX. April 26, 2002.
- **Carliner, S.** (2002.) Design a wizard and make magic performance. International Society for Performance Improvement Conference. Dallas, TX. April 25, 2002.
- **Carliner, S.** (2001.) From technical writing to content development. Council for Programs in Scientific and Technical Communication Conference. Pittsburgh, PA. October 12-13, 2001.
- **Carliner, S.** (2000.) On-line or off the map? when online learning should work – and when it won't. Annual Conference. American Society for Training and Development, Connecticut Chapter. Hartford, Connecticut. November 3, 2000.
- **Carliner, S.** (2000.) We are what we measure: the state of the art (or lack thereof) in productivity and effectiveness metrics for information designers and developers. 47th Society for Technical Communication Annual Conference. Orlando, FL. May 22, 2000.
- **Carliner, S.** (2000.) Thirteen ideas for attracting and retaining users' attention. FORUM 2000. International Technical Communication Organization (INTECOM). London,UK. June 13, 2000.
- **Carliner, S.** (2000.) Trends in our business. FORUM 2000. International Technical Communication Organization (INTECOM). London,UK. June 13, 2000.
- **Carliner, S.** and Gribbons, W. (2000.) Business skills: The new imperative in technical communication education and skills. 47th Society for Technical Communication Annual Conference. Orlando, FL. May 24, 2000.
- **Carliner, S.** (2000.) A "consumer's guide" to research results: How to determine whether you can trust the "experts'" data. 47th Society for Technical Communication Annual Conference. Orlando, FL. May 22, 2000.
- **Carliner, S.** (2000.) Taking a campaign approach to information design and development. 47th Society for Technical Communication Annual Conference. Orlando, FL. May 23, 2000.
- **Carliner, S.** (2000.) Information design: what it is, how it differs from document design, and how to get with the program. 47th Society for Technical Communication Annual Conference. Orlando, FL. May 22, 2000.
- **Carliner, S.** (1999.) My year of retooling from practicing professional to tenure-track professor. International Professional Communication Conference. IEEE Professional Communication Society. New Orleans, LA. September 9, 1999.
- **Carliner, S.** (1999.) Towards a more international union: the experience of establishing professional organizations for technical communicators in Europe and the Middle East. International Professional Communication Conference. IEEE Professional Communication Society. New Orleans, LA. September 9, 1999.
- **Carliner, S.** (1999.) Using qualitative research techniques to learn the cultural language. International Professional Communication Conference. IEEE Professional Communication Society. New Orleans, LA. September 8, 1999.

- **Carliner, S.** (1999.) Knowledge management, intellectual capital, and technical communication. International Professional Communication Conference. IEEE Professional Communication Society. New Orleans, LA. September 8, 1999.
- **Carliner, S.** (1999.) Documentation therapy: Identifying communication problems beyond misspelled words and dangling participles. Society for Technical Communication Annual Conference. Cincinnati, OH. May 17, 1999.
- **Carliner, S.** (1999.) Communication therapy. University of Minnesota Communicator's Forum Conference. May 6, 1999.
- **Carliner, S.** (1999.) Getting in touch with your inner leader. OutFront 4. OutFront Minnesota. Wilmar, Minnesota. March 30, 1999.
- **Carliner, S.** (1999.) Applying the Kirkpatrick model to documentation. Association of Teachers of Technical Writing Conference. Atlanta, GA. March 25, 1999.
- **Carliner, S.** (1998.) Working in the 90s: experience versus skills on the job. 45th Society for Technical Communication Annual Conference. Anaheim, CA. May 19, 1998.
- **Carliner, S.** (1998.) Design a wizard (and help users make magic). 45th Society for Technical Communication Annual Conference. Anaheim, CA. May 18, 1998.
- **Carliner, S.** (1998.) Taking a campaign approach to information design and development. 45th Society for Technical Communication Annual Conference. Anaheim, CA. May 18, 1998.
- **Carliner, S.** (1997.) Information architecture. STC Region 6 Conference. Milwaukee Society for Technical Communication. Milwaukee, WI. October 24, 1997.
- **Carliner, S.** (1997.) The volunteer connection: recruiting and retaining volunteers. The Connected Community Conference. GLC Action Council. Minneapolis, MN. August 5, 1997.
- **Carliner, S.** (1997.) Nuts and bolts of newsletters. The Connected Community Conference. GLC Action Council. Minneapolis, MN. August 5, 1997.
- **Carliner, S.** (1997.) Demonstrating the value of technical communication products. 44th STC Annual Conference. Toronto, ONT. May 14, 1997.
- **Carliner, S.** (1997.) What electronic performance support systems are (and why they're important to technical communicators). 44th STC Annual Conference. Toronto, ONT. May 13, 1997.
- **Carliner, S.** (1997.) Do numbers really tell the story: using qualitative analysis and evaluation techniques International Society for Performance Improvement Annual Conference. Anaheim, CA. April 17, 1997.
- **Carliner, S.** (1996.) What electronic performance support systems are (and why they're important to technical communicators). 43rd STC Annual Conference. Seattle, WA. May 8, 1996.
- **Carliner, S.** (1996.) Information architecture. 43rd STC Annual Conference. Seattle, WA. May 7, 1996.
- **Carliner, S.** (1996.) Demonstrating the value of technical communication products. Currents 1996. Atlanta Society for Technical Communication. Atlanta, GA. February 17, 1996.
- **Carliner, S.** (1995.) Learning at the Fernbank Museum of Natural History. 1995 National Society for Performance & Instruction Annual Conference. Atlanta, GA. March 30, 1995.

- **Carliner, S.** (1995.) Contractor's and consultant's roundtable. 1995 National Society for Performance & Instruction Annual Conference. Atlanta, GA. March 29, 1995.
- **Carliner, S.** (1995.) Do numbers really tell the story: Using qualitative analysis and evaluation techniques. National Society for Performance and Instruction Annual Conference. Atlanta, GA. March 29, 1995.
- **Carliner, S.** (1995.) 25 tips for writing online information. Currents 1995. Atlanta Society for Technical Communication. Atlanta, GA. February 25, 1995.
- **Carliner, S.** (1994.) Information architecture. STC Region 8 Conference. San Diego Society for Technical Communication. San Diego, CA. November 12, 1994.
- **Carliner, S.** (1994.) Demonstrating the value of technical communication products. 1994 STC Region 8 Conference. San Diego Society for Technical Communication. San Diego, CA. November 12, 1994.
- **Carliner, S.** (1994.) Information architecture. STC Region 2 Conference. Carolina Society for Technical Communication. Cary, NC. October 29, 1994.
- **Carliner, S.** (1994.) 25 tips for writing online information. 1994 STC Region 5 Conference. Houston Society for Technical Communication. Houston, TX. October 14, 1994.
- **Carliner, S.** (1994.) The role of a professional society in promoting the education of technical communicators. 41st Society for Technical Communication Annual Conference. Minneapolis, MN. May 18, 1994.
- **Carliner, S.** (1994.) Towards 2000: Trends in technical communication. 41st Society for Technical Communication Annual Conference. Minneapolis, MN. May 17, 1994.
- **Carliner, S.** (1994.) The complete manager, part III: How to hire a technical communication consultant (and know you got a good deal). 41st Society for Technical Communication Annual Conference. Minneapolis, MN. May 16, 1994.
- **Carliner, S.** (1994.) Information pollution: What are we doing to our students? 1994 National Society for Performance & Instruction Annual Conference. San Francisco, CA. April 8, 1994.
- **Carliner, S.** (1994.) Learning at the Exploratorium. 1994 National Society for Performance & Instruction Annual Conference. San Francisco, CA. April 6, 1994.
- **Carliner, S.** (1994.) Contractor's and consultant's roundtable. 1994 National Society for Performance & Instruction Annual Conference. San Francisco, CA. April 6, 1994.
- **Carliner, S. & Huff, C.** (1993.) The business and ethics of information technology. 40th Society for Technical Communication Annual Conference. Dallas, TX. June 9, 1993.
- **Lincoln, D., & Carliner, S.** (1993) Can performance technology help improve U.S. public health? National Society for Performance and Instruction Conference. Chicago, IL. April 16, 1993.
- **Carliner, S.** (1993.) Creative technical communication: An oxymoron? Ninth Central Florida Technical Writing Conference. Orlando, FL. February 27, 1993.
- **Carliner, S.** (1992.) Marketing writing services. National Association of Professional Writing Consultants Conference. Stone Mountain, GA. June 6, 1992.
- **Carliner, S.** (1992.) Information pollution: What are we doing to our readers? 39th Society for Technical Communication Annual Conference. Atlanta, GA. May 12, 1992.
- **Carliner, S.** (1991.) The technologies and challenges of communications. Speech

Communications Association International Conference. Atlanta, GA. November 2, 1991.

- **Carliner, S.** (1991.) A five-step process for addressing the skills challenges of the 1990s. National Association of System Programmers Conference. Atlanta, GA. April 15, 1991.
- Richards, B. & **Carliner, S.** (1991.) Can performance technology help the schools. National Society for Performance and Instruction Annual Conference. Los Angeles, CA. April 5, 1991.
- Hutchinson, C., & **Carliner, S.** (1991.) 99 seconds: New ways to improve performance without training. National Society for Performance and Instruction Annual Conference. Los Angeles, CA. April 4, 1991.
- **Carliner, S.** (1991.) The six deadly sins of educational communication. National Society for Performance and Instruction Annual Conference. Los Angeles, CA. April 3, 1991.
- Brown, D., **Carliner, S.**, & Dean, M. (1990.) Creativity in technical communication. 37th International Technical Communication Conference. Santa Clara, CA. May 21, 1990.
- **Carliner, S.** (1988.) Communication skills for trainers. National Society for Performance and Instruction Conference. Denver, CO. March 29, 1989.
- **Carliner, S.**, Banchemo, L., Barnum, C., and Cohen, G. (1988.) Are technical writers ruining the language? 35th International Technical Communication Conference. Philadelphia, PA. May 16, 1988.
- **Carliner, S.** (1985.) Style: An old concern for the new media. FORUM 85. INTECOM. Helsingor, Denmark. August 29, 1985.
- **Carliner, S.** (1985.) Video writer. 32nd International Technical Communication Conference. Houston, TX. May 1985.
- **Carliner, S.** (1984.) Revisions: a new writer's challenge. 31st International Technical Communication Conference. Seattle, WA. April 28, 1984.

Keynote Presentations at Refereed Conferences and Invited Public Academic Lectures

- **Carliner, S.** (2023.) The new vocabulary of careers. Asia-Pacific Career Development Association. Astana, Kazakhstan: May 24, 2023. (Presented remotely.)
- **Carliner, S.** (2023.) What's ahead in Technical Communication? 2023 Society for Technical Communication Summit. Atlanta, GA, May 15, 2023.
- **Carliner, S.** (2022.) Spotlight Session: The Looming Reskilling Challenge: Endless Opportunity, Even More Complexity. Online Educa 2022. Berlin, Germany. November 23, 2022.
- **Carliner, S.** (2022.) State of the Technical Communication Industry in the US and Canada. International Meeting of the Council of Programs on Scientific Communication (CPTSC). Virtual. October 29, 2022.
- Cohen, S., Alsheail, A., **Carliner, S.**, Prathima a-v, & Tan, K. (2022.) Global Insight - Future-Proof Your Organization: Reskilling and Upskilling on A Global Landscape (recorded). Association for Talent Development International Conference and Exhibition. Orlando, FL. May 15-18, 2022.

- **Carliner, S.** (2022.) Staying Employable in an Era of Disruption. Ontario Association of Adult and Continuing Education School Board Directors. April 12, 2022.
- **Carliner, S.** (2022.) Guest speaker. Instructional Technology Foundations. Indiana University. April 5, 2022.
- **Carliner, S.** (2022.) Guest speaker. Foundations of Technical Communication and Information Design. Colorado State University. February 15, 2022.
- **Carliner, S.,** Driscoll, M., & Thayer, Y. (2022.) Career Anxiety. Workforce Development Affinity Group of the Network of Jewish Human Services Agencies. Virtual. January 19, 2021.
- **Carliner, S.** (2021.) Guest speaker. Doctoral seminar. Department of Writing Studies. University of Minnesota. October 21, 2021.
- **Carliner, S.** (2020.) The teaching opportunities offered by remote and hybrid instruction. Journée Qualité UH2C/UMAQ: “La qualité de l’enseignement à distance EAD !!” Université Hassan II de Casablanca et Union Marocaine pour la Qualité. November 27, 2020.
- **Carliner, S.** (2020.) eBooks and computers in education. Virtual presentation to PhD class at Johns Hopkins University. August 6, 2020.
- **Carliner, S.** (2019.) Using Moodle to Support Blended Learning (When the Instructor Is Also the Production Team). Dawson College Annual Moodle Conference. May 24, 2019.
- **Carliner, S.** (2019.) Who are we? A report on the 2018 census of technical communicators. 2019 Society for Technical Communication Summit. Denver, CO: May 8, 2019.
- **Carliner, S.** (2017.) Existential questions in Technical Communication: Education, experience, community, and technology, TCWorld 2017, tekomp, Stuttgart, Germany, October 24, 2017.
- Bonk, C. J., Dron, J., Mishra, S., Panke, S., Reeves, T.C., **Carliner, S.,** Jagannathan, S., Kim, P., Devers, C., Andrichuk, G., Bastiaens, T. & Jhangiani, R. (2017.) Future directions and challenges of e-learning: A panel conversation of e-learning leaders, E-Learn 2017, Association for the Advancement of Computers in Education, Vancouver, BC: October 18, 2017.
- **Carliner, S.** (2017.) The value of professional communication: A matter of values, Fourth Forum on Intercultural Business Communication, School of International Studies, University of International Business and Economics. Beijing, China, July 15, 2017,
- **Carliner, S.** (2017.) Technology as a research topic in corporate communication, University of International Business and Economics, Beijing, China, June 29, 2017.
- **Carliner, S.** (2016.) Five lessons that Business English can learn from Professional and Technical Communication, 12th National Conference on Business English, Sichuan International Studies University(SISU), Chongqing, China, October 28-30, 2016.
- **Carliner, S.** (2016.) Parallel discussions in communications research, Third Forum on Cross-Culture and Corporate Communication. Beijing, China, July 9, 2016.
- **Carliner, S.** (2016.) Revolution or evolution? Lessons from nearly a half century of computers and learning. ED-MEDIA 2016. Association for the Advancement of Computers in Education. Vancouver, BC, June 30, 2016.

- **Carliner, S.** (2016.) Myths and realities about the commerce of content, Annual General Meeting of the Toronto Chapter of the Society for Technical Communication, Toronto, ON, June 9, 2016.
- **Carliner, S.** (2015.) Spotlight Session for early career researchers in Educational Technology. ED-MEDIA 2015. Association for the Advancement of Computers in Education. Montreal, QC, June 22, 2015.
- **Carliner, S.** (2014.) Occupational Culture: An Alternate Cultural Framework for Professional Communication Theory and Research. International Conference on Professional Communication in the Intercultural Context: Theory and Practice and The Fourth Conference of the Asian-Pacific Language for Specific Purposes and Professional Communication Association, ^[SEP]The Third National Conference of ^[SEP]the Chinese Association for English for Specific Purposes. University of International Business and Economics. Beijing, China, June 8, 2014.
- **Carliner, S.** (2013.) Keynote: Money matters: The roles of economics and business in the future of Technical Communication. Annual Conference of the Association for Computing Machinery (ACM) Special Interest Group on Documentation (SIGDOC). Greenville, NC. September 30, 2013.
- **Carliner, S.** (2013.) Becoming a professional: The roles of informal learning and technology in the careers of healthcare professionals. 2013 Celebration of Teaching, Learning, and Scholarship in Health Sciences Education. Queen’s University. Kingston, ON. June 19, 2013.
- **Carliner, S.** (2013.) After-dinner presentation: Lessons learned from Facebook, LinkedIn, and Twitter. Adult Education Certificate dinner for the Ontario Institute for the Study of Education (OISE) at the University of Toronto Continuing Education. Toronto, ON. May 2, 2013.
- **Carliner, S.** (2013.) Myths and realities about e-learning. Haute Ecole de Commerce (HEC) Montreal. Montreal, QC. April 2013.
- **Carliner, S.** (2012.) The future of the Technical Communication brand. TCANZ Conference 2012. Auckland, NZ. October 25, 2012.
- **Carliner, S.** (2012.) *Really* ready for prime time? A framework for considering the practical challenges facing “game-changing” educational technologies. Association for the Advancement of Computers in Education. E-Learn 2012. Montreal, QC. October 11, 2012.
- **Carliner, S.** (2012.) What the research says about informal learning (and implications for practicing professionals). International Conference for eLearning in the Workplace. New York, NY. June 14, 2012.
- **Carliner, S.** (2012.) Leveraging technology for financial planner education. 2012 Financial Planning Standards Council Educator Conference. Toronto, ON. May 16, 2012.
- **Carliner, S.** (2011.) Crafting the Conversation: 10 Tips for Actively Engaging with Students in and out of the Cegep Classroom. Marianopolis College. Montreal, QC. February 9, 2011.
- **Carliner, S.** (2010.) Staying relevant. 2010 Canadian Society for Training and Development Conference. Toronto, ON. November 19, 2010.

- **Carliner, S.** (2010.) Key issues affecting the future of workplace learning and performance. Montpelier, VT. Vermont chapter of the American Society for Training and Development. October 6, 2010.
- **Carliner, S.** (2010.) Informal learning: 10 issues to consider. Calgary, AB, Canadian Society for Training and Development Symposium. May 28, 2010.
- **Carliner, S.** & Grummit, L. (2010.) Introducing the new *Competencies for Training and Development Professionals*. Calgary, AB, Canadian Society for Training and Development Symposium. May 27, 2010.
- **Carliner, S.** (2010.) Following form: Eleven real world insights into template-based writing. Society for Technical Communication Annual Summit. Dallas, TX. May 3, 2010.
- **Carliner, S.** (2010.) Technical Communication 2.0. Spectrum 2010. Rochester chapter of the Society for Technical Communication. Rochester, NY. April 9, 2010.
- **Carliner, S.** (2008.) Capitalizing on the knowledge economy: Lessons from our neighbors. IEEE Professional Communications Society. International Professional Communications Conference. Montreal, QC. July 14, 2008.
- Johnston, L., **Carliner, S.**, Millar, R., Siemens, G., & Wihak, C. (2008.) Plenary: Informal learning in the workplace. Third annual symposium of the Work and Learning Knowledge Centre. Work and Learning Knowledge Centre of the Canadian Council on Learning. Ottawa, ONT. May 15, 2008.
- **Carliner, S.** (2008.) Recent research in information and document design. Red River Community College. Fifth Annual Technical Communication Conference. Winnipeg, MB. April 14, 2008.
- **Carliner, S.**, Driscoll, M., & Petherbridge, D. (2008.) Town Hall Meeting: Technology and Human Resource Development. Academy of Human Resource Development Annual Research Conference. Panama City, FL. February 21, 2008.
- **Carliner, S.** (2007.) Evaluating learning. Equitas Symposium on Evaluation. Montreal, QC. May 4, 2007.
- **Carliner, S.** (2006.) Celebrating good work, understanding good work. Awards Banquet of the Eastern Ontario Chapter of the Society for Technical Communication. Ottawa, ONT. March 28, 2006.
- **Carliner, S.** (2006.) Design research: A longer-term approach to understanding effective online learning and communication for the workplace. Symposium for CIRTA. Universite de Quebec a Montreal. Montreal, QC. January 20, 2006.
- **Carliner, S.** (2005.) Research on professional practice in technical communication. Annual Ph.D. Student Residency. Department of English, Distance Education Program in Technical Communication. Texas Tech University. Lubbock, TX. May 26-27, 2005.
- **Carliner, S.** (2005.) Design research in communication. Maquarie University, Division of Linguistics and Psychology, Department of Linguistics. Sydney, NSW. May 9, 2005.
- **Carliner, S.** (2005.) The future of technical communication: The one we want or the one we get? Information Design & Management 2005. James River Chapter of the Society for Technical Communication. Williamsburg, VA. January 15, 2005.
- **Carliner, S.** (2004.) Physical, cognitive and affective: A three-part model of

information design. McGill University Faculty of Education. Montreal, QC. February 13, 2004.

- **Carliner, S.** (2004.) Ten years after: Reflections on the tenth anniversary of the publication of *Techniques for technical communicators*. Society for Technical Communication, Washington DC Chapter. Washington, DC. February 8, 2004.
- **Carliner, S.** (2004.) Genre: A useful construct for researching online communication in the workplace. Document Design 2004. University of Tilburg. Tilburg, the Netherlands. January 23, 2004.
- **Carliner, S.** (2003.) What you don't know can hurt you: Issues raised by an annual survey of training directors. E-Learn 2003. American Association for Computers in Education. Phoenix, AZ. November 8, 2003.
- **Carliner, S.** (2004.) What do we manage: A report on the portfolios of technical communication managers. STC/Philadelphia Metro Professional Day. Philadelphia, PA. March 15, 2003.
- **Carliner, S.** (2003.) We are what we measure: metrics for technical communicators. India Society for Technical Communication. Fourth Annual Conference. Bangalore, India. December 13, 2002.
- **Carliner, S.** (2003.) Applying iterative design techniques from industry in the classroom. Professional development series. City University of Hong Kong. Hong Kong, SAR. February 17, 2003.
- **Carliner, S.** (2003.) Emerging genres of online communication: what they are and how people use them. Professional development series. City University of Hong Kong. Hong Kong, SAR. January 27, 2003.
- **Carliner, S.** (2002.) Eight lessons that web designers can learn from museum exhibit designers. India Society for Technical Communication. Fourth Annual Conference. Bangalore, India. December 13, 2002.
- **Carliner, S.** (2002.) Defining "quality" communication: A matter of perspective. Professional development series. Department of English and Communication. City University of Hong Kong. Hong Kong, SAR. December 9, 2002.
- **Carliner, S.** (2002.) More about information design. Professional development series. Department of English and Communication. City University of Hong Kong. Hong Kong, SAR. November 4, 2002.
- **Carliner, S.** (2002.) What is information design and how does it affect the teaching of technical writing? Professional development series. Department of English and Communication. City University of Hong Kong. Hong Kong, SAR. October 7, 2002.
- **Carliner, S.** (2002.) Lessons from mall and retail design for web design. Public lecture. City University of Hong Kong. Hong Kong, SAR. July 9, 2002.
- **Carliner, S.** (2002.) Hard times and hard choices: Strategic challenges for technical communication managers. Metro Baltimore chapter of the Society for Technical Communication Annual Conference. Baltimore, MD. March 20, 2002.
- **Carliner, S.** (2002.) We are what we measure: Metrics for technical communicators. Professional Day. Connecticut Society for Technical Communication. Hartford, CT. March 16, 2002.
- **Carliner, S.** (2001.) Information design: What it is and how it differs from document design. Public lecture. City University of Hong Kong. Hong Kong, SAR. July 4, 2001.
- **Carliner, S.** (2001.) Issues in online learning. Public lecture. City University of Hong

- Kong. Hong Kong, SAR. July 2, 2001.
- **Carliner, S.** (2001.) The 5 ws and h of usability testing. Public lecture. City University of Hong Kong. Hong Kong, SAR. June 29, 2001.
 - **Carliner, S.** (2001.) Information pollution: What are we doing to our readers? American Society of Indexers Annual Conference. Boston, MA. June 2001.
 - **Carliner, S.** (2001.) Real life stories of winning communication. TOUCHSTONE/2001: Awards Banquet of the Northern California Chapters of the Society for Technical Communication Annual Publications Competition. San Ramon, CA. March 24, 2001.
 - **Carliner, S.** (2001.) Annual Awards Banquet of the Boston and Northern New England chapters of the Society Communication Joint Publications Competition. North Reading, MA. February 6, 2001.
 - **Carliner, S.** (2000.) Trends 2000: Thriving in the boom years. Metro Baltimore Society for Technical Communication Annual Seminar. Baltimore, Maryland. April 15, 2000.
 - **Carliner, S.** (1999.) Future travels of the InfoWrangler. Currents 1999. Atlanta Society for Technical Communication. Atlanta, Georgia. April 17, 1999.
 - **Carliner, S.** (1999.) Future travels of the InfoWrangler. Mid-Connecticut Society for Technical Communication Conference, Hartford, Connecticut. March 13, 1999.
 - **Carliner, S.** (1998.) Closing keynote. East Meets West: Slovenian Technical Communication Conference. Ljubljana, Slovenia. October 29, 1998.
 - **Berger, P., Carliner, S., Redish, J., & Williams, E.** (1998.) Panel on technical communication. INFOS Conference (Slovenian version of COMDEX). Ljubljana, Slovenia. October 27, 1998.
 - **Carliner, S.** (1998.) Lessons from the idiot box: Life lessons from television 45th Society for Technical Communication Annual Conference. Anaheim, CA. May 19, 1998.
 - **Carliner, S.** (1998.) The intelligent enterprise. Department of Strategic Planning. Carlson School of Business, University of Minnesota. Minneapolis, MN. February 5, 1998.
 - **Carliner, S.** (1998.) An introduction to intellectual capital. QUOROM—a program of the Carlson School of Business, University of Minnesota. Minneapolis, MN. January 14, 1998.
 - **Carliner, S.** (1997.) Future travels of the InfoWrangler. St. Louis Society for Technical Communication Annual Holiday Party and Awards Banquet. St. Louis, MO. December 11, 1997.
 - **Carliner, S.** (1997.) What's ahead in technical communication. Hermes SoftLab Technical Vitality Symposium. Ljubljana, Slovenia. December 2, 1997.
 - **Carliner, S.** (1997.) Meeting of the minds: the future of technical communication. Joint session of the International Professional Communication and ACM Special Interest Group on Documentation Conferences. Snowbird, UT. October 22, 1997.
 - **Carliner, S.** (1997.) Managing Online Information Symposium. Atlanta, GA. September 24, 1997.
 - **Carliner, S.** (1997.) Open forum. Workplace Alliance Conference. Minneapolis, MN. September 19, 1997.
 - **Carliner, S.** (1997.) Ideas for efficient, effective board interactions. The Connected

Community: A Conference for Volunteers and Leaders to Develop Basic Skills in Running Community Organizations. GLC Action Council. Minneapolis, MN. August 5, 1997.

- **Carliner, S.** (1997.) Future travels of the infowrangler. 1997 New Media Instructional Design Symposium. Influent Technologies, Inc. Chicago, IL. July 18, 1997.
- **Carliner, S.** (1996.) Information pollution: what are we doing to our readers? STC Region 8 Conference. Orange County Society for Technical Communication. Anaheim, CA. October 27, 1996.
- **Carliner, S.** (1996.) Lessons from award-winning publications. Awards Banquet. Minnesota Society for Technical Communication. Minneapolis, MN. June 11, 1996.
- **Carliner, S.** (1996.) Lessons from the South. 40th Anniversary Banquet of the Atlanta Society for Technical Communication. Atlanta, GA. May 31, 1996.
- **Carliner, S.** (1996.) Lessons from award-winning publications. Awards Banquet. Eastern Ontario Society for Technical Communication. Ottawa, ONT. March 11, 1996.
- **Carliner, S.** (1996.) Electronic performance support systems. Turning on the Power: Making the Technologies of Training Work for You. Manitoba Department of Adult Education and Training. Winnipeg, MB. February 26, 1996.
- **Carliner, S.** (1996.) Information pollution: What are we doing to our readers? Winter Seminar. Lone Star Society for Technical Communication. Dallas, TX. February 9, 1996.
- **Carliner, S.** (1995.) Information pollution: What are we doing to our readers? STC Region 6 Conference. Manitoba Society for Technical Communication. Mankato, MN. October 20, 1995.
- **Carliner, S.** (1995.) What's ahead in technical communication? STC Region 2 Conference. Metro Baltimore Society for Technical Communication. Baltimore, MD. October 14, 1995.
- **Carliner, S.** (1995.) Information pollution: What are we doing to our readers? STC Region 5 Conference. Houston chapter of the Society for Technical Communication. Houston, TX. October 15, 1994.
- **Carliner, S.** (1993.) Lessons from the idiot box: Life lessons from television. Annual Holiday Party. Silicon Valley Society for Technical Communication. Palo Alto, CA. December 16, 1993.
- **Carliner, S.** (1993.) Information pollution: What are we doing to our readers? STC Region 7 Conference. Puget Sound Society for Technical Communication. Seattle, WA. November 12, 1993.
- **Carliner, S.** (1993.) Becoming a leader. STC Region 1 Chapter Leader's Conference. Boston Society for Technical Communication. Burlington, MA. November 6, 1993.
- **Carliner, S.** (1993.) Information pollution: What are we doing to our readers? STC Region 2 Conference. Washington Society for Technical Communication. Washington, DC. October 23, 1993.
- **Carliner, S.** (1993.) Computer-based training: A real tool for real learning. 1993 Rennslear Polytechnic Institute Technical Writer's Institute. Troy, NY. May 27, 1993.
- **Carliner, S.** (1993.) Looking ahead in technical communication. Carnegie Mellon

- University. Pittsburgh, PA. April 22, 1993.
- **Carliner, S.** (1993.) Looking ahead in technical communication. Spectrum 93. Rochester Society for Technical Communication. Rochester, NY. March 26, 1993.
 - **Carliner, S.** (1993.) Lessons from the idiot box: Life lessons learned from television. Currents 1993. Atlanta Society for Technical Communication. Atlanta, GA. March 20, 1993.
 - **Carliner, S.** (1993.) Information pollution: What are we doing to our readers? Ninth Central Florida Technical Writing Conference. Orlando, FL. February 27, 1993.
 - **Carliner, S.** (1992.) Information pollution: What are we doing to our readers? Practical Conference on Communication. Eastern Tennessee Society for Technical Communication. Oak Ridge, TN. November 6, 1992.
 - **Carliner, S.** (1992.) Information pollution: what are we doing to our readers? 1992 St. Louis Society for Technical Communication Conference. St. Louis, MO. October 17, 1992.
 - **Carliner, S.** (1992.) Information pollution: what are we doing to our readers? Southern College of Technology. Marietta, GA. April 29, 1992.
 - **Carliner, S.** (1991.) The future of technical communication. 1991 Lone Star Society for Technical Communication Winter Seminar. Dallas, TX. January 17, 1991.
 - **Carliner, S.** (1990.) The future of technical communication. FutureCom 1990. Front Range Community College. Boulder, CO, September 28, 1990.
 - **Carliner, S.** (1989.) The future of technical communication. Technical Communication: a Dynamic Profession. Niagara Frontier Society for Technical Communication, Buffalo, NY, November 28, 1989.
 - **Carliner, S.** (1989.) What's ahead in technical communication. University of Minnesota Department of Rhetoric. St. Paul, MN. October 17, 1989.
 - **Carliner, S.** (1989.) The future of technical communication. Technicom '89. Canadian conference sponsored by the Toronto Society for Technical Communication. Toronto, ONT, September 11, 1989.
 - **Carliner, S.** (1989.) The future of technical communication. Spectrum '89. Rochester Society for Technical Communication. Rochester, NY. April 7, 1989.
 - **Carliner, S.** (1988.) What's ahead in technical communication? Practical Conference on Communication. Eastern Tennessee Society for Technical Communication. Oak Ridge, TN. October 12, 1988.
 - **Carliner, S.** (1988.) The future of technical communication. Currents 1988. Atlanta Society for Technical Communication. Atlanta, GA. February 20, 1988.
 - **Carliner, S.** (1987.) The future of technical communication. 1987 Awards Banquet of the Chicago Society for Technical Communication. Chicago, IL. December 5, 1987.

Keynote Presentations at Privately Sponsored Industry Conferences and Corporate Groups

- **Carliner, S.** (2023.) Training Design Basics. Parole Board of Canada Learning Summit. Ottawa, ON. November 12, 2023.
- **Carliner, S.** (2021.) Promoting technical writing services. SoftServ. TechComm Conference 2021. Virtual. November 13, 2021. (Link to presentation: <https://career.softserveinc.com/en-us/stories/perform-better-dot-techcomm-extras-to-add-to-your-working->

routine?fbclid=IwAR2Ilmq9IK0_XW2qIO8UlivsgrbYEJspfdWai1-Z8dDcPbK9leQ5RP_x3Ww.)

- **Carliner, S.,** Karsenti, T., Jacobsen, M., Canuel, M. (2020.) Open Educational Resources (OERs) and access to education. MTL-Connect Virtual Conference from Montreal, QC. October 15, 2020.
- **Carliner, S.** (2020.) Which choice will land me the job? Sifting through the expanding options for skills-related education. MTLconnecte. Montreal, QC. October 14, 2020.
- **Carliner, S.** (2016.) How technical communication ended up here: A brief walk through the four epochs of our field, TechCommCon, University of Washington at Tacoma, October 14, 2016.
- **Carliner, S.** (2016.) Now and then: How yesterday's experiences with technology suggest tomorrow's. Lead-in Group, Training Magazine Shanghai Summit, Shanghai, China, April 15, 2016.
- **Carliner, S.** (2013.) Rethinking evaluation. LearnX Asia-Pacific. Sydney, New South Wales. September 11, 2013.
- **Carliner, S.** (2013.) Developing competent workers: The roles of formal and informal learning. LearnX Asia-Pacific. Sydney, New South Wales. September 10, 2013.
- **Carliner, S.** (2009.) Communication in the workplace. Maimonides Home, Montreal, QC, May 13, 2009.
- **Carliner, S.** (2007.) Creative e-learning. LearnX Asia-Pacific 2007, conference of TRAINING/Australia Magazine. Sydney, Australia. TRAINING/Australia Magazine. July 27, 2007.
- **Carliner, S.** (2007.) Learning leaders: Selling your services in your organisation. LearnX Asia-Pacific 2007, conference of TRAINING/Australia Magazine. Sydney, Australia. July 27, 2007.
- **Carliner, S.** (2007.) Reflecting on the good, the bad and the ugly of technology. LearnX Asia-Pacific 2007, conference of TRAINING/Australia Magazine. Sydney, Australia. July 26, 2007.
- **Carliner, S.,** Hughes, M., O'Keefe, S., & Welinske, J. (2006.) Panel of pundits. 2006 User Assistance Conference. WritersUA. Palm Springs, CA. April 11, 2006.
- **Carliner, S.** (2006.) Best practices in training: What the research says. TRAINING 2006. VNU Business Media. Orlando, FL. March 7, 2006.
- **Carliner, S.** (2004.) Testosterone or technology improvement? An honest assessment of current training issues. TRAINING 2004. VNU Business Media. Atlanta, GA. March 2, 2004.
- **Carliner, S.** (2003.) A business approach to advancing learning and development initiatives. CHEX User's Group Meeting. Children's Hospital Corporation of America. Ft. Lauderdale, FL. October 9, 2003.
- **Carliner, S.** (2003.) Interview with Bob Mager and Donald Kirkpatrick. 2003 Training Director's Forum. VNU Business Media. Phoenix, AZ. June 8-11, 2003.
- **Carliner, S.** (2002.) What executives must know about e-learning. Hong Kong Police Department. Hong Kong SAR. November 9, 2002.
- **Carliner, S.** (2002.) Museums: a model for knowledge-driven transformation. Training Director's Forum. VNU Business Media. Las Vegas, NV. June 10, 2002.
- **Carliner, S.** (2002.) Making it work: case studies and techniques for real-world online learning. Online Learning Asia. VNU Business Media and Times Publishing.

Singapore. May 15, 2002.

Carliner, S. (2001.) First Tuesday in October: Weighing in on current trends in online learning. VNU Business Media. Online Learning 2001. Los Angeles, October 2, 2001.

- **Carliner, S.** (2001.) Metrics for technical communicators. Solutions, Inc. TECH/COMM 2001. Washington, DC. July 17, 2001.
- **Carliner, S.** (2001.) Making it work: Case studies and techniques for real-world online learning. Online learning Asia. VNU Business Media. Singapore. May 16, 2001.
- **Carliner, S.** (2001.) What's working, what's not: A panel of leading solution providers. Online learning Asia. VNU Business Media. Singapore. May 16, 2001.
- **Carliner, S.** (2001.) You have choices: Options for online learning. Online Learning Asia. VNU Business Media. Singapore. May 16, 2001.
- **Carliner, S.** (2000.) Future travels of the InfoWrangler. TRAINING 2000. Lakewood Conferences/Bill Communications. Atlanta, Georgia. February 22, 2000.
- **Carliner, S.** (2000.) Information design: The big picture. TECH/COMM2000. SOLUTIONS, Inc. Seattle, WA. July 15, 2000.
- **Carliner, S.** (1999.) Training Director's Forum. Lakewood Conferences. Phoenix, Arizona. June 8, 1999.
- **Carliner, S.** (1999.) New Media Instructional Design Symposium. Influent Technologies, Inc. Chicago, IL. July 30, 1998.
- **Carliner, S.** (1999.) Clinic for Technical Communication Managers. Solutions Seminars. Washington, DC. July 27, 1998.
- **Carliner, S.** (1998.) Creating infowrangers: Identifying and developing information design and development skills for the online era. InfoOnline Conference. Influent Technology Group. Chicago, IL. November 3, 1998.
- **Carliner, S.** (1998.) Unsolved problems: An open idea exchange for implementing online learning in your organization. Online Learning 1998. Lakewood Conferences and Asymetrix. Anaheim, CA. September 24, 1998.
- **Carliner, S.** (1998.) Taking a campaign approach to performance improvement. New Media Instructional Design Symposium. Influent Technologies, Inc. Chicago, IL. July 31, 1998.
- **Carliner, S.** (1990.) Marketing online information. IBM Santa Teresa Lab. San Jose, CA. August 22, 1990.

Webcasts and Tele-Presentations

- **Carliner, S.** (2023.) Training to contribute to the literature review of the I4PL Skills for Success project. Institute for Performance and Learning membership events.
 - December 19, 2023
 - December 18, 2023
- **Carliner, S. & Bekkouche, N.** (2023.) Informal learning in the work of Learning and Development: Emerging insights from L&D professionals. Institute for Performance and Learning National Webinar Series. December 6, 2023.
- **Carliner, S., Redish, J., Schriver, K. & Bleiel, N.** (2023.) STC@70. Society for Technical Communication. March, 15, 2023.

- **Carliner, S.** (2022.) Managing the middle years of your career. Institute for Performance and Learning National Webinar Series. October 26, 2022.
- Rockley, A. (host) & **Carliner, S.** (guest). (2022.) Harness your mindset to stay employed and employable. Essential Mindset podcast. January 27, 2022.
- Frawley, L. (host) & **Carliner, S.** (guest) (2021.) Career frameworks in technical communication. TC Dojo podcast.
- **Carliner, S.** (2021.) Managing the middle years of your career. Webinar. Society for Technical Communication. December 1, 2021.
- **Carliner, S.** (2021.) What do they really think of us? Results of a study of perceptions held by “clients” of technical communication. Webinar. Society for Technical Communication. November 1, 2021.
- **Carliner, S.** (2019.) What does this mean? Results of the 2018 census of technical communicators. Society for Technical Communication Summit. April 16, 2019.
- **Carliner, S.** & Grummit, L. (2018.) Introducing the *Competencies for Performance and Learning Professionals*. Institute for Performance and Learning, February 26, 2018.
- **Carliner, S.** (2017.) Informal learning basics, HBC Learning and Development Staff, February 23, 2017.
- **Carliner, S.** and Grummit, L. (2017.) Introducing the *Competencies for Performance and Learning Professionals* webinar. Institute for Performance and Learning, January 17, 2017.
- **Carliner, S.** and Grummit, L. (2016.) Introducing the *Competencies for Performance and Learning Professionals* webinar. Institute for Performance and Learning, November 17, 2016.
- **Carliner, S.** (2016.) Writing objectives for learning and development programs, Canada School for Public Service, December 1, 2016.
- **Carliner, S.** (2016.) Connected classrooms: Encourage collaboration and engagement, Spark Online Conference, American Society for Association Executives, November 15, 2016.
- **Carliner, S.** (2016.) Tips for just-in-time training. Human Capital Institute. February 23, 2016.
- **Carliner, S.** (2016.) Informal learning basics. Twin Cities chapter of Society for Technical Communication. January 12, 2016.
- **Carliner, S.** (2015.) Teaching in the live virtual classroom, Concordia University, October 29, 2015.
- **Carliner, S.** (2015.) Silver, gold and bronze: A three-tiered approach to instructional design projects. Association for Talent Development Learning and Development Community. October 22, 2015.
- **Carliner, S.** (2015.) Silver, gold and bronze: How much effort should you really invest in a project? Association Canadienne des conceptrices et des concepteurs pédagogiques / Canadian Association of Instructional Designers. October 13, 2015.
- **Carliner, S.** (2015.) How to give a webinar. International Association of Jewish Vocational Services. March 11, 2015.
- **Carliner, S.** (2013.) Needs assessment for e-learning. Canada Border Services Agency. Webcast: December 5, 2013.
- **Carliner, S.** (2013.) Tips for teaching in the virtual classroom. Concordia University. Webcast: November 22, 2013.

- **Carliner, S.** (2013.) Informal learning basics. Human Capital Institute. Webcast: September 26, 2013.
- **Carliner, S.** (2013.) e-Learning for new teaching strategies and technologies. Singapore Civil Service College. January 23, 2013.
- **Carliner, S.** (2012.) What's the real scoop on informal learning? Thought leader conversation. E-Learning Guild. Webcast: December 11, 2012.
- **Carliner, S.** (2012.) Evaluating informal learning. American Society for Training and Development. Webcast: September 27, 2012.
- **Carliner, S.** (2012.) Informal learning: What *are* the basics? American Society for Training and Development. Webcast: July 21, 2012.
- **Carliner, S.** (2011.) The informal learning challenge: How much do you already know? How much have you already done? E-Learning Guild. Webcast: October 6, 2011.
- **Carliner, S.** (2011.) Should you or shouldn't you? Research-validated practices for designing effective e-learning. HR.com. Webcast: August 22, 2011.
- **Carliner, S.** (2010.) *The Competencies for Training and Development Professionals: Your tool for effectively hiring, coaching, and managing your training staff.* Canadian Society for Training and Development. Webcast: October 13, 2010.
- **Carliner, S.** (2010) *The Competencies for Training and Development Professionals: Your tool for managing your career.* Canadian Society for Training and Development. Webcast: September 15, 2010.
- **Carliner, S.** (2010.) Overview of the *The Competencies for Training and Development Professionals* for CSTD chapter leaders. Canadian Society for Training and Development. Webcast: June 22, 2010.
- **Carliner, S.** (2009.) Maybe you shouldn't do that: Research-validated practices for e-learning. Canadian Society for Training and Development. Webcast: September 24, 2009.
- **Carliner, S.** (2009.) Designing and developing e-learning projects: A three-tiered approach. Canadian Society for Training and Development. Webcast: January 21, 2009.
- **Carliner, S.** (2007.) ROI unpacked: Canadian ROI Network online series, level 3. Canadian Society for Training and Development. Webcast: March 14, 2007.
- Anderson, T., Porter, D., **Carliner, S.**, & Lyons, P. (2006.) Issues forum: Sustainability of online learning in Canada. Elluminate, Inc. Webcast: October 18, 2006.
- **Carliner, S.** (2006.) What we know and what we need to know about competencies, diversity, e-learning, and performance improvement. Canadian Society for Training and Development. Webcast: September 19, 2006.
- **Carliner, S.** (2006.) State of the field: E-learning. Canadian Society for Training and Development. Webcast: June 20, 2006.
- **Carliner, S.** (2006.) State of the field: Competencies. Canadian Society for Training and Development. Webcast: June 19, 2006.
- **Carliner, S.** (2006.) Instructional design at the crossroads: What e-learning has done, what e-learning could do to us. E-learning Guild. Webcast: June 15, 2006.
- **Carliner, S.** (2005.) The sophisticated and the not: The defining gap in training today. E-learning Guild. Webcast: October 7, 2005.

- **Carliner, S.** (2005.) Teaching in the virtual classroom. Chubb Insurance. Webcast: June 28, 2005.
- **Carliner, S.** (2005.) An overview of strategic planning for e-learning. Strategic planning for e-learning web conference. E-Learning Guild. Webcast: April 7, 2005.
- **Carliner, S.** (2004.) Seven ideas for sprucing up help. Society for Technical Communication Telephone Seminar. Society for Technical Communication. Phonecast: July 21, 2004.
- **Carliner, S.** (2004.) Managing the training function. TRAINING 2004. VNU Business Media. Webcast: February 2, 9, 16, 23 and March 3, 2004.
- **Carliner, S.** (2004.) Demonstrating the value of technical communication products and services. Society for Technical Communication Telephone Seminar. Society for Technical Communication. Phonecast: January 28, 2004.
- **Carliner, S.** (2003.) Ten unique characteristics of design for e-learning. Joint webcast by the American Society for Training and Development and WebEx. Webcast: November 20, 2003.
- **Carliner, S.** (2003.) Ten unique characteristics of design for e-learning. HSBC Bank Training Department Annual Meeting. Webcast: July 4, 2003.
- **Carliner, S.** (2003.) Ten unique characteristics of design for e-learning. American Society for Training and Development. Webcast: March 12, 2003.
- **Carliner, S.** (2003.) What do we manage: A survey of the management portfolios of large technical communication departments. Society for Technical Communication Telephone Seminar. Webcast: November 5, 2003.
- **Carliner, S.** (2003.) 25 tips for communicating online. Wachovia Bank. Webcast September 29, 2003.
- **Carliner, S.** (2003.) Business models for training and performance improvement organizations. Webinar program. American Society for Training and Development. Webcast: April 8, 2003.
- **Carliner, S.** (2002.) Information design: The big picture. Singapore chapter of the Society for Technical Communication. Phonecast: September 3, 2002.
- **Carliner, S.** (2002.) An overview of online learning and what it means to technical communicators. Webcast to the Wisconsin Society for Technical Communication. Milwaukee, Wisconsin. Webcast: February 13, 2001.
- Gordon, J, **Carliner, S.**, & Dublin, L. (2000.) The future of online learning. TRAINING/Live! (by LiveWare5 and TRAINING magazine). Webcast: February 21, 2000.
- Hayhoe, G. **Carliner, S.**, & Kiernan, C. (1992.) Preparing for the 39th Society for Technical Communication Annual Conference. Telebroadcast of the STC/South Carolina. Telecast: January 29, 1992.

Workshops for Academic, Professional and Community Organizations

- **Carliner, S.** (2022.) Thinking bigger and broader: An overview of curriculum design. Online Educa 2023. Berlin, Germany. November 22, 2022.
- **Carliner, S.** (2023.) Thinking bigger and broader: Specifying a curriculum design competency for L&D professionals. AECT Annual Convention. Orlando, Florida. October 15, 2023.

- **Carliner, S.** & Cucinelli, G. (2023.) Engaging with Learning Experience Design. International Society for the Learning Sciences Conference. Montreal, QC. June 10, 2023.
- **Carliner, S.** (2023.) Information design workshop. 2023 Society for Technical Communication Summit. Atlanta, GA, May 14, 2023.
- **Carliner, S.** (2022.) Thinking bigger and broader: Specifying a curriculum design competency for L&D professionals. Online Educa 2022. Berlin, Germany. November 23, 2022.
- **Carliner, S.** (2022.) Workshop: Get That Flippin' Right: Part 2—Facilitating Class Sessions. Concordia Continuing Education. Montreal, QC. May 31, 2022.
- **Carliner, S.** (2022.) Bon Career: Tips for thriving In your career after you land your first job. FutureBound Program. Concordia University. Montreal, QC. May 5, 2022.
- **Carliner, S.** (2021.) Designing assignments to promote the integration of students into their professional communities. Concordia Continuing Education. Montreal, QC. October 14, 2021.
- **Carliner, S.** (2021.) Staying employed and employable in an era of disruption. PowerSkills Virtual Career Summit 2021. McGill University Continuing Education. Montreal, QC. August 5, 2021
- **Carliner, S.** (2020.) Information design workshop. Virtual Summit 2020. Society for Technical Communication. May 21, 2020.
- **Carliner, S.** (2019.) Thirteen suggestions for writing engaging, relevant, and validated questions. Association for the Advancement of Computers in Education. E-Learn 2019 Conference. New Orleans, LA: November 4, 2019.
- **Carliner, S.** & Bakir, I. (2019.) Supervising the internship journey. XD 2019 : The International Conference on Experience Design, Innovation , and Entrepreneurship. Griffith University, Mount Gravatt, Australia, August 14, 2019.
- **Carliner, S.** (2019.) Preparing integrative literature reviews. 2019 Canadian Association for the Study of Discourse and Writing Conference. Vancouver, BC, June 1, 2019.
- **Carliner, S.** (2019.) Technical communication at the History Colorado Center: A post-conference tour. 2019 Society for Technical Communication Summit. Denver, CO: May 5, 2019.
- **Carliner, S.** (2019.) Information design workshop: The essentials. 2019 Society for Technical Communication Summit. Denver, CO: May 5, 2019.
- **Carliner, S.** (2018.) Technical Communication Manager Certificate Program. Society for Technical Communication. Presented online, September 20 through November 1, 2018.
- **Carliner, S.** (2018.) Instructional Design for Technical Communicators Certificate Program. Society for Technical Communication. Presented online, June 6 through 27, 2018.
- **Carliner, S.** (2017.) Instructional Design for Technical Communicators Certificate Program. Society for Technical Communication. Presented online, November 2 through 30, 2017.
- **Carliner, S.** (2016.) Technical Communication Manager Certificate Program. Society for Technical Communication. Presented online, October 6 through November 10, 2016.

- **Carliner, S.** (2016.) Instructional Design for Technical Communicators Certificate Program. Society for Technical Communication. Presented online, September 8 through 29, 2016.
- **Carliner, S.** (2016.) Writing for publication, Parts 1 and 2. SSCI / A&HCI Essay Writing Symposium Three Gorges University, Yichang, China, July 16, 2016.
- **Carliner, S.** (2016.) An index for measuring corporate communication, Forum on Cross-Culture and Corporate Communication. Beijing, China, July 10, 2016.
- **Carliner, S.** (2016.) ID Challenges: Designing and Developing Instruction on a Shoestring Budget. Association for Talent Development. 2016 Association for Talent Development International Conference and Exposition, Denver, CO: May 24-27, 2016
- Bolton, C. & **Carliner, S.** (2015.) Curriculum Design Sprint, Concordia University, Montreal, QC, January 15, 2015.
- Acemian, N. & **Carliner, S.** (2015.) Digital Learning Lab. Remodeling Your Curriculum Workshop, Concordia University, Montreal, QC, December 4, 2015.
- Bolton, C., Acemian, N., Caignon, P., **Carliner, S.,** & Dysart-Gale, D., (2015.) Foundational Skills Lab. Remodeling Your Curriculum Workshop, Concordia University, Montreal, QC, December 4, 2015.
- **Carliner, S.** (2015.) Instructional Design for Technical Communicators Certificate Program. Society for Technical Communication. Presented online, July 20 through August 10, 2015.
- **Carliner, S.** (2015.) ID Challenges: Designing and Developing Instruction on a Shoestring Budget. Canadian Society for Training and Development. Calgary, AB. June 17, 2014.
- **Carliner, S.** (2015.) ID Challenges: Designing and Developing Instruction on a Shoestring Budget. Canadian Society for Training and Development. Edmonton, AB. June 16, 2014.
- **Carliner, S.** (2015.) ID Challenges: Designing and Developing Instruction on a Shoestring Budget. Canadian Society for Training and Development. Toronto, ON. June 4, 2014.
- **Carliner, S.** (2015.) ID Challenges: Designing and Developing Instruction on a Shoestring Budget. Canadian Society for Training and Development. Ottawa, ON. June 3, 2014.
- **Carliner, S.** (2015.) ID Challenges: Designing and Developing Instruction on a Shoestring Budget. Canadian Society for Training and Development. Montreal, QC. June 2, 2014.
- **Carliner, S.** (2015.) Developing a digital curriculum plan. Concordia University. Montreal, QC, February 20, 2015.
- **Carliner, S.,** Boettger, R.K. & Friess, E. (2014.) How do we adapt the traditional research article so it's relevant to the practicing professional? 2014 International Professional Communication Conference. IEEE Professional Communication Society. Pittsburgh, PA. October 13, 2014.
- **Carliner, S.,** Dysart-Gale, D. & Stratigopoulos, N. (2014.) Camtasia – Faculty demo. e.Scape 2014. Concordia University. Montreal, QC. October 2, 2014.
- **Carliner, S.** (2014.) Developing a digital curriculum plan. Concordia University. Montreal, QC, August 26, 2014.

- Reilly, R. & **Carliner, S.** (2014.) “Flipping” your course workshop. Concordia University. Montreal, QC, August 20-21, 2014.
- **Carliner, S.** (2014.) Preparing Integrative Literature Reviews. International Conference on Professional Communication in the Intercultural Context: Theory and Practice and The Fourth Conference of the Asian-Pacific Language for Specific Purposes and Professional Communication Association, ^[1]SEP, The Third National Conference of ^[1]SEP, the Chinese Association for English for Specific Purposes. University of International Business and Economics. Beijing, China, June 8, 2014.
- **Carliner, S.** (2013.) Technical Communication Manager Certificate Program. Society for Technical Communication. Presented online, January 10 through February 14, 2013.
- **Carliner, S.** (2012.) Practical Tips for Effective, Efficient Projects. TCANZ Conference 2012. Auckland, NZ. October 24, 2012.
- **Carliner, S.** (2012.) A Crash Course in Writing e-Learning Programs. TCANZ Conference 2012. Auckland, NZ. October 24, 2012.
- **Carliner, S.** (2012.) An Overview of Effective Board Governance. Society for Technical Communication, webcast online, May 10, 2012.
- **Carliner, S.** (2012.) An Overview of Effective Board Governance. Society for Technical Communication Certification Commission, webcast online, January 12, 2012.
- **Carliner, S.** (2011.) Technical Communication Manager Certificate Program. Society for Technical Communication. Presented online, October 13 through November 10, 2011.
- **Carliner, S.** (2011.) Workshop in Preparing Integrative Literature Reviews. IEEE Professional Communication Society. Offered online, September 26 through November 27, 2011.
- **Carliner, S.** (2011.) Internally Marketing Your Technical Communication Services. New York Metro chapter of the Society for Technical Communication, New York, NY, June 16, 2011.
- **Carliner, S.** (2011.) Developing the business case for a major project. 2011 American Society for Training and Development International Conference and Exposition. Orlando, FL: May 21, 2011.
- **Carliner, S.** (2011.) Technical Communication Manager Certificate Program. TechComm Summit 2011, 58th Annual Conference of the Society for Technical Communication. Sacramento, CA: May 14-15, 2011.
- **Carliner, S.,** Grainger, M., & Bennett, L.A. (2011.) The incredible shrinking training program. 2011 Annual Meeting of the Society for Industrial and Organizational Psychologists. Chicago, IL. April 13, 2011.
- **Carliner, S.** (2010.) Technical Communication Manager Certificate Program. Society for Technical Communication. Presented online, October 14 through November 28, 2010.
- **Carliner, S.** (2010.) Workshop: Learning by examples: Advanced design for online learning. ED-MEDIA 2010. Association for the Advancement of Computers in Education. Toronto, ON. June 29, 2010.
- **Carliner, S.** (2010.) Technical Communication Manager Certificate Program. Society for Technical Communication Annual Conference. Dallas, TX. May 1-2, 2010.

- **Carliner, S.** (2009.) Technical Communication Manager Certificate Program. Society for Technical Communication (presented online). October 27, November 3, November 10, November 17, November 24, and December 1, 2009.
- **Carliner, S.** (2009.) Working effectively through committees. Cummings Jewish Centre for Seniors. Montreal, QC. May 14, 2009.
- **Carliner, S.** (2009.) Technical Communication Manager Certificate Program. Society for Technical Communication Annual Conference, Atlanta, GA, May 2-3, 2009.
- **Carliner, S.** (2008.) Designing informal learning. Online Educa, Berlin, December 3, 2008.
- **Carliner, S.** (2008.) Designing effective online learning: Balancing the educational, institutional, and personal. Educational Media Development group of Athabasca University. Edmonton, AB. May 29, 2008.
- **Carliner, S.** (2008.) The information design workshop. Alberta chapter of the Society for Technical Communication. Calgary, AB: April 11, 2008.
- **Carliner, S.** (2008.) Where you've been and where you're going: Evaluation for the smaller nonprofit. Brookline Community Foundation. Brookline, MA: March 31, 2008.
- **Carliner, S.** (2008.) Consulting 101: Seven Practical tips. Academy of Human Resource Development Annual Research Conference. Panama City, FL. February 21, 2008.
- **Carliner, S.,** Barrington, J., Dyer, L., Bligh, K.. (2007.) Course design workshop. Concordia University Centre for Teaching and Learning Services. Montreal, QC. May 28 – June 1, 2007.
- **Carliner, S.,** Barrington, J., Dyer, L., and Lazar, B., (2006.) Course design workshop. Concordia University Centre for Teaching and Learning Services. Montreal, QC. December 11-15, 2006.
- **Carliner, S.** (2006.) The information design workshop: A process-oriented approach. Toronto chapter of the Society for Technical Communication. Toronto, ONT. November 6, 2006.
- **Carliner, S.** (2006.) Values and practicalities: A leadership retreat. Federation/CJA Montreal West Island Management Committee. Lantier, QC. October 29, 2006.
- **Carliner, S.,** Barrington, J., Kaye, L., Lazar, B., Rovinescu, O., & Slapcoff, M. (2006.) Course design workshop. Concordia University Centre for Teaching and Learning Services. Montreal, QC. May 15-19, 2006.
- **Carliner, S.** (2006.) Physical, cognitive and affective: A three-part model of information design. Toronto chapter of the Society for Technical Communication. Toronto, ONT. March 27, 2006.
- Driscoll, M. & **Carliner, S.** (2006.) Advanced design for e- learning. TechKnowledge 2006. American Society for Training and Development. Denver, CO. January 30, 2006.
- **Carliner, S.** (2005.) Learning at the Royal Ontario Museum: Lessons for the design of informal learning programs. Canadian Society for Training and Development. Toronto, ONT. November 7, 2005.
- **Carliner, S.** (2005.) Advanced design for e- learning. ED-MEDIA 2005. Association for the Advancement of Computing in Education. Montreal, QC. June 26, 2005.

- **Carliner, S.** (2005.) 18 tips for designing and developing online learning. Atlanta chapter of the Society for Technical Communication. Atlanta, GA. February 25, 2005.
- **Carliner, S.** (2005.) Promoting your services in your organization. Atlanta chapter of the Society for Technical Communication. Atlanta, GA. February 25, 2005.
- **Carliner, S.** (2005.) Leadership training workshop. Junior League of North Fulton and Gwinett Counties. Alpharetta, GA. February 24, 2005.
- **Carliner, S.** (2004.) Planning for the business side of e-learning. Association for Educational Communications and Technology Annual Conference. Chicago, IL. October 20, 2004.
- **Carliner, S.** (2004.) Determining the return on investment in training and performance improvement programs. City University of Hong Kong, Management Development Centre. Hong Kong. July 8, 2004.
- **Carliner, S.** (2004.) Teaching in a virtual classroom. Tellin' ain't training conference. American Society for Training and Development International Conference and Exposition. Alexandria, VA. June 15, 2004.
- **Carliner, S.** (2004.) Making learning technology work for you and your learners. Tellin' ain't training conference. American Society for Training and Development International Conference and Exposition. Alexandria, VA. June 15, 2004.
- **Carliner, S.** (2004.) Business strategy for e-learning: A practical introduction. American Society for Training and Development International Conference and Exposition. Washington, DC. May 22, 2004.
- **Carliner, S.** (2004.) Advanced design for online learning. International Society for Performance and Improvement Annual Conference. Tampa, FL: April 19-20, 2004.
- **Carliner, S.** (2004.) Determining the return on investment in training and performance improvement programs. Jointly sponsored by the Puget Sound chapter of the International Society for Performance Improvement, Seattle chapter of the American Society for Training and Development and the Seattle chapter of the Organizational Development Network. Redmond, WA. April 13, 2004.
- **Carliner, S.** (2004.) Demonstrating the value of technical communication products. Metro Baltimore chapter of the Society for Technical Communication. Baltimore, Maryland. April 3, 2004.
- **Carliner, S.** (2004.) Document design for print and online: A real-world approach. Washington DC chapter of the Society for Technical Communication. Washington, DC. February 8, 2004.
- **Carliner, S.** (2003.) Planning the business side of distance learning. 19th Conference on Distance Learning and Teaching. University of Wisconsin—Madison. Madison, WI. August 13, 2003.
- **Carliner, S.** (2003.) Designing performance support systems for learning and user assistance. 50th Society for Technical Communication Annual Conference. Dallas, TX. May 22, 2003.
- **Carliner, S.** (2003.) 18 tips for designing and developing online learning. Jointly sponsored by the Atlanta chapter of the International Society for Performance Improvement and the Technology Special Interest Group of the Atlanta chapter of the American Society for Training and Development. Atlanta, GA. March 18, 2003.
- **Carliner, S.** (2003.) Metrics for communication departments. Hong Kong chapter of the International Association of Business Communicators. Hong Kong SAR.

February 7, 2003.

- **Carliner, S.** (2002.) 25 tips for communicating online. Hong Kong chapter of the International Association of Business Communicators. Hong Kong SAR. December 6, 2002.
- **Carliner, S.** (2002.) Planning the business side of distance learning. 18th Conference on Distance Learning and Teaching. University of Wisconsin—Madison. Madison, WI. August 14, 2002.
- **Carliner, S.** (2002.) 10 ideas for efficient, effective board interactions. Washington DC chapter of the Society for Technical Communication. Olney, Maryland. August 3, 2002.
- **Carliner, S.** (2002.) A crash course for volunteer board leaders. Texas Pharmacy Association Annual Conference. Corpus Christie, TX. June 5, 2002.
- **Carliner, S.** (2002.) 10 ideas for efficient, effective board interactions. Software Process Improvement Network (SPIN). Acton, Massachusetts. June 1, 2002.
- **Carliner, S.** (2001.) Demonstrating the value of technical communication products. Northern California chapters of the Society for Technical Communication. San Ramon, CA. March 24, 2001.
- **Carliner, S.** (2001.) The information design workshop. New York Metro chapter of the Society for Technical Communication. New York, NY February 24, 2001.
- **Carliner, S.** (2000.) The information design workshop. 47th Society for Technical Communication Annual Conference. Orlando, FL. May 24, 2000.
- **Carliner, S.** (2000.) Developing your inner leader. OutFront 5. OutFront Minnesota. Rochester, MN. March 17, 2000.
- **Carliner, S.** (1999.) The information design workshop. University of Minnesota Communicator's Forum. Minneapolis, MN. June 30, 1999.
- **Carliner, S.** (1999.) The information design workshop. Tucson chapter of the Society for Technical Communication. Tucson, AZ. April 24, 1999.
- **Carliner, S.** (1999.) Designing electronic performance support. Currents 1999. Atlanta chapter of the Society for Technical Communication. Atlanta, GA. April 17, 1999.
- **Carliner, S.** (1998.) 10 ideas for efficient, effective board interactions. Jewish Reconstructionist Federation Bi-annual Convention. Chicago, IL. November 7, 1998.
- **Carliner, S.** (1998.) 10 ideas for efficient, effective board interactions. Workplace Alliance Conference. Minneapolis, MN. September 18, 1998.
- **Carliner, S.** (1997.) 10 ideas for efficient, effective board interactions. The Connected Community. GLC Action Council. Minneapolis, MN. August 5, 1997.
- **Carliner, S.** (1997.) 10 ideas for efficient, effective board interactions. Jewish Reconstructionist Federation Midwestern Leadership Weekend. Kenosha, WI. June 14, 1997.
- **Carliner, S.** (1997.) MultiMedia play: Choosing media to communicate technical information. Canada West Coast chapter of the Society for Technical Communication. Vancouver, BC. March 18, 1997.
- **Carliner, S.** (1997.) MultiMedia play: Choosing media to communicate technical information. Houston chapter of the Society for Technical Communication. Houston, TX. March 13, 1997.

- **Carliner, S.** (1997.) Wizards, coaches, and more: Taking a campaign approach to information. Houston chapter of the Society for Technical Communication. Houston, TX. March 13, 1997.
- **Carliner, S.** (1997.) 15 essential techniques of information design. Houston chapter of the Society for Technical Communication. March 12, 1997.
- **Carliner, S.** (1997.) 25 tips for writing online information. Houston chapter of the Society for Technical Communication. Houston, TX. March 12, 1997.
- **Carliner, S.** (1997.) Electronic performance support systems. Eastern Ontario chapter of the Society for Technical Communication. Ottawa, ONT. March 8, 1997.
- **Carliner, S.** (1997.) MultiMedia play: Choosing media to communicate technical information. Twin Cities chapter of the Society for Technical Communication. St. Paul, MN. February 21, 1997.
- **Carliner, S.** (1996.) Demonstrating the value of technical communication products. American Medical Writer's Association Annual Conference. Chicago, IL. November 6, 1996.
- **Carliner, S.** (1996.) Information architecture. Israel chapter of the Society for Technical Communication. Tel Aviv, Israel. September 8, 1996.
- **Carliner, S.** (1996.) Qualitative approaches to analysis and evaluation. 43rd Society for Technical Communication Annual Conference. Seattle, WA. May 6, 1996.
- **Carliner, S.** (1996.) Electronic performance support systems. Atlanta chapter of the International Society for Performance Improvement. Atlanta, GA. April 21, 1996.
- **Carliner, S. & Huff, C.** (1995.) Building a better work team. Using the team roles inventory. 41st Society for Technical Communication Annual Conference. Washington, DC. April 28, 1995.
- **Carliner, S.** (1994.) Strategic evaluation for nonprofits. Nonprofit Resource Center. Atlanta, GA. October 12, 1994.
- **Carliner, S.** (1993.) The secrets of successful marketing communications. Alaska chapter of the Society for Technical Communication. Anchorage, AK. November 22, 1993.
- **Carliner, S.** (1993.) Qualitative approaches to analysis and evaluation. 40th Society for Technical Communication Annual Conference. Dallas, TX. June 10, 1993.
- **Carliner, S.** (1993.) The secrets of successful marketing communications. Society for Technical Communication Annual Conference. Dallas, TX. June 6, 1993.
- **Carliner, S.** (1993.) How to communicate your training programs to potential customers: A five-pronged approach. National Society for Performance and Instruction Annual Conference. Chicago, IL. April 13, 1993.
- **Carliner, S.** (1993.) Qualitative approaches to analysis and evaluation. Eastern Ontario Society for Technical Communication. Ottawa, ONT. January 30, 1993.
- **Carliner, S.** (1992.) What they didn't teach you in grammar school. 39th Society for Technical Communication Annual Conference. Atlanta, GA. May 14, 1992.
- **Carliner, S.** (1992.) Writing online information. Eastern Ontario chapter of the Society for Technical Communication. Ottawa, ONT. February 8, 1992.
- **Carliner, S.** (1991.) What they didn't teach you in grammar school. Montreal chapter of the Society for Technical Communication. Montreal, QC. February 24, 1991.
- **Carliner, S.** (1991.) The writer's workshop: Honing your writing skills. University of Ottawa. Ottawa, ONT. February 23, 1991.

- **Carliner, S.** (1991.) Self-editing workshop. Currents 1991. Atlanta chapter of the Society for Technical Communication. Atlanta, GA. February 9, 1991.
- **Carliner, S.** (1991.) What they didn't teach you in grammar school. Lone Star chapter of the Society for Technical Communication Winter Seminar. Dallas, TX. January 17, 1991.
- **Carliner, S.** (1990.) Self-editing and other editorial challenges. Eastern Ontario chapter of the Society for Technical Communication. Ottawa, ONT. March 10, 1990.
- **Carliner, S.** (1989.) Self-editing workshop. Technicom '89. Toronto Society for Technical Communication. Toronto, ONT. September 12, 1989.
- **Carliner, S.** (1990.) Writing for non-print media. Eastern Ontario chapter of the Society for Technical Communication. Ottawa, ONT. March 10, 1990.
- **Carliner, S.** (1989.) Self-editing workshop. Village Writer's Group Conference. Atlanta, GA. March 4, 1989.
- **Carliner, S.** (1988.) Workshop in information planning. Atlanta chapter of the Society for Technical Communication. Atlanta, GA. October 21, 1988.
- **Carliner, S.** (1987.) Workshop in information planning. 34th International Technical Communication Conference. Denver, CO. May 12, 1987.

Workshops at Privately Sponsored Industry Conferences and for Corporations

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- **Carliner, S. & Banner, P.** (2018.) Advanced instructional design for elearning certificate, Online Learning 2018. Lakewood Media. Chicago, IL, October 7-8, 2019.
- **Carliner, S. & Banner, P.** (2017.) Advanced instructional design for elearning certificate, Online Learning 2017. Lakewood Media. New Orleans, LA, September 24-25, 2017.
- **Carliner, S.** (2017.) Mastering the training business certificate: A crash course for professionals working internally and externally. Training 2017, Lakewood Media, San Diego, CA, January 27-28, 2017.
- **Carliner, S.** (2016.) The discerning eye: Experiencing art for better elearning, Online Learning 2016, Lakewood Media, Chicago, Illinois, September 22, 2016.
- **Carliner, S.** (2015.) Flipping Your Class: Mastering the Strategy. Online Learning 205. Lakewood Media. Denver, CO: October 8, 2015.
- Designing Micro-Learning Objects. Boston Scientific Global Training Summit. September 24, 2015.
- **Carliner, S.** (2015.) Informal Learning Basics. PwC. Toronto, ON. February 24, 2015.
- **Carliner, S.** (2012.) Supporting the Effective Design of Instruction. Turkish Management Centre. Istanbul, Turkey. February 23, 2012.
- **Carliner, S.** (2012.) The Power of Alignment: Strengthening the Design of Training Programs. Istanbul, Turkey. February 23, 2012.
- **Carliner, S.** (2011.) Nine Suggestions for Writing Engaging and Relevant Questions. WritersUA Conference, Long Beach, CA, March 13, 2011.
- **Carliner, S.** (2011.) Advanced Design for e-Learning Certificate Program. TRAINING 2011, San Diego, CA, February 5-6, 2011.

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- **Carliner, S.** (2005.) Managing the training function. ST Microelectronics. Fuveau, France. August 29 - 31, 2005.
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- **Carliner, S.** (2005.) Managing the training function. TRAINING/Spring 2005. VNU Business Media. New Orleans, LA. February 26-27, 2005.
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- **Carliner, S.** (2004.) Click and learn: Complementing and blending with other materials to complete the e-learning experience. E-Learning Guild. Chicago, IL. June 16, 2004.
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- **Carliner, S.** (1999.) Promoting your services in your organization. SOLUTIONS Publications Management Clinic. SOLUTIONS, Inc. Orlando, FL. April 12, 1999.
- **Carliner, S.** (1999.) Creating InfoWranglers: Developing the skills needed by tomorrow's information designers and developers. SOLUTIONS Publications Management Clinic. SOLUTIONS, Inc. Orlando, FL. April 12, 1999.
- **Carliner, S.** (1999.) Personnel management: Hiring, coaching, appraising, and rewarding employees. SOLUTIONS Publications Management Clinic. SOLUTIONS, Inc. Orlando, FL. April 11, 1999.
- **Carliner, S.** (1999.) Design a wizard (and make magic performance). WinWriter's Conference. WinWriter's, Inc. Seattle, WA. February 21, 1999.
- **Carliner, S.** (1999.) A crash course in evaluation. TRAINING 1999. Lakewood Conferences. Chicago, IL. February 4, 1999.
- **Carliner, S.** (1999.) Designing information for reuse. SOLUTIONS Technical Writing Clinic. SOLUTIONS, Inc. Phoenix, AZ. February 2, 1999.
- **Carliner, S.** (1999.) Communicating online. SOLUTIONS Technical Writing Clinic. SOLUTIONS, Inc. Phoenix, AZ. February 2, 1999.
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- **Carliner, S.** (1998.) Promoting your services in your organization. SOLUTIONS Publications Management Clinic. SOLUTIONS, Inc. Washington, DC. July 29, 1998.
- **Carliner, S.** (1998.) Demonstrating the value and effectiveness of training programs. Training Director's Forum. Lakewood Conferences. Ft. Lauderdale, FL. May 17, 1998.
- **Carliner, S.** (1997.) The information design workshop. Hermes Softlab. Ljubljana, Slovenia. December 1-5, 1997.
- **Carliner, S.** (1997.) Business boot camp for information development managers. Managing Online Information Symposium. Influent Technology Group. Atlanta, GA. September 22, 1997.
- **Carliner, S.** (1998.) Wizards, coaches, and more. New Media Instructional Design Symposium. Influent Technology Group. Chicago, IL. July 15, 1997.

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- **Carliner, S.** (2023.) Handling resistant learners. Lakewood Media. Training 2023. Orlando, FL. February 13, 2023.
- **Carliner, S.** (2023.) Onboarding: The key to successfully integrating staff. Lakewood Media. Training 2023. Orlando, FL. February 13, 2023.
- **Carliner, S.** (2022.) An ode to lists: The ultimate organizer. MegaComm 2022. Virtual. February 7, 2022.
- **Carliner, S.,** Driscoll, M., & Thayer, Y. (2021.) The looming reskilling challenge: Endless opportunity, even more complexity. TechLearn 2021. Lakewood Media. Virtual. October 28, 2021.
- **Carliner, S. &** Driscoll, M.(2021.) What every trainer needs to know about learning theories (and a few myths you need to avoid). TechLearn 2021. Lakewood Media. Virtual. October 25, 2021.
- **Carliner, S.,** Karsenti, T., Jacobsen, M., & Canuel, M (2020.) Open Educational Resources and access to education. MTLconnecte. Montreal, QC. October 14, 2020.
- **Carliner, S.** and Driscoll, M. (2020.) Career essentials: 99-second career advice for training professionals, Training 2020, Orlando, FL. February 24, 2020.
- Driscoll, M. & **Carliner, S.** (2020.) Technology essentials: An overview of all technologies training professionals use, Training 2020, Orlando, FL. February 25, 2020.
- **Carliner, S. &** Driscoll, M. (2020.) Business essentials: The five facts every professional should know about the training business, Training 2020, Orlando, FL. February 25, 2020.
- Driscoll, M. & **Carliner, S.** (2020.) Learning essentials: What every trainer needs to know about learning theories (and a few myths to avoid), Training 2020, Orlando, FL. February 24, 2020.

- **Carliner, S.** & Driscoll, M. (2020.) Training essentials: Why our work matters, Training 2020, Orlando, FL. February 24, 2020.
- **Carliner, S.** (2019.) Evaluating informal learning, Lakewood Media, Training 2019, Orlando, FL. February 2019.
- **Carliner, S.** (2018.) Marketing your products and services, Lakewood Media, Online Learning 2018, Chicago, IL. October 9, 2018.
- **Carliner, S.** (2018.) Evaluating informal learning, Lakewood Media, Training 2018, Atlanta, GA. February 2018.
- **Carliner, S.** and Driscoll, M. (2018.) An overview of Training and Development, Lakewood Media, Training 2018, Atlanta, GA. February 2018.
- **Carliner, S.** (2017.) Existential questions in Technical Communication: Education, experience, community, and technology, Adobe TechComm Road Show 2017, Montreal, QC, December 8, 2017.
- **Carliner, S.** (2017.) Flipping your class: Mastering the strategy underlying the approach, Online Learning 2017. Lakewood Media. New Orleans, LA, September 26, 2017.
- **Carliner, S.** (2017.) Evaluating informal learning, Lakewood Media, Training 2017, San Diego, CA. January 29, 2017.
- **Carliner, S.** (2016.) Seven things technical communicators need to know about instructional design. TechCommCon, University of Washington at Tacoma, October 15, 2016.
- **Carliner, S.** (2016.) Informal learning basics. Core-4 Conference, Association for Talent Development, New Orleans, LA, September 29, 2016.
- **Carliner, S.** (2016.) Flipping your class: Mastering the strategy. Online Learning 2016, Lakewood Media, Chicago, Illinois, September 22, 2016.
- **Carliner, S.** (2016.) 5 tips for just-in-time training. Lead-in Group. Training Magazine China Summit, Shanghai, Shanghai, China, April 15, 2016.
- **Carliner, S.** (2016.) Evaluating informal learning. Lakewood Media. Orlando, FL: February 16, 2016.
- **Carliner, S.** (2015.) Results of the Training Magazine Consumer Study of Technology. Online Learning 205. Lakewood Media. Denver, CO: October 8, 2015.
- **Driscoll, M.** & **Carliner, S.** (2015.) Everything Old is New Again: A Scorecard on Training Trends. Training 2015. Lakewood Media. Atlanta, GA. February 11, 2015.
- **Carliner, S.** (2015.) Should I or Shouldn't I? Research-Based Guidance for Training Practices. Training 2015. Lakewood Media. Atlanta, GA. February 10, 2015.
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- **Carliner, S.** (2014.) 10 research-based principles about informal learning processes. Training 2014. Lakewood Media, San Diego, CA, February , 2014.
- **Carliner, S.** (2014.) Training Magazine Research 2014: A study of tuition reimbursement programs. Training 2014. Lakewood Media, San Diego, CA, February , 2014.
- **Carliner, S.** (2012.) From fad to reality: Case studies of real training projects. Training 2012, Lakewood Media, Atlanta, GA, February 15, 2012.
- **Carliner, S.** (2012.) Case studies: Living with learning technology. Training 2012, Lakewood Media, Atlanta, GA, February 14, 2012.

- **Carliner, S.** (2012.) Case studies: Addressing everyday training and development challenges. Training 2012, Lakewood Media, Atlanta, GA, February 13, 2012.
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- **Carliner, S.** (2011.) Informal learning basics: What's realistic and what's hype. Learning 3.0. Lakewood Media, Chicago, IL, October 5, 2011.
- **Carliner, S.** (2011.) Is informal learning right for you? Ten issues and technologies to consider. Learning Solutions 2011. E-Learning Guild. March 23, 2011.
- **Carliner, S.** (2011.) Eight design lessons we can learn from museums. Learning Solutions 2011. E-Learning Guild. March 23, 2011.
- **Carliner, S.** (2011.) Research-validated practices for designing effective e-learning. WritersUA Conference. Long Beach, CA. March 14, 2011.
- **Carliner, S.** (2011.) Spending on training stuck in neutral. TRAINING 2011, San Diego, CA, February 7, 2011.
- **Carliner, S.** (2008.) The difference between e-learning and user assistance technology. 2008 User Assistance Conference. WritersUA, Inc. Portland, OR. March 17, 2008.
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- **Carliner, S.** (2007.) Poster session: In defense of the lecture. VNU Business Media. TRAINING Solutions 2007. Salt Lake City, UT. October 15, 2007.
- **Carliner, S.** (2007.) Training musical chairs: The encyclopedia of performance interventions. TRAINING Solutions 2007. Salt Lake City, UT. October 15, 2007.
- **Carliner, S.** (2007.) Worst case survival plan: Exit strategies for e-learning projects. Nielsen Business Media. TRAINING Solutions 2007. Salt Lake City, UT. October 15, 2007.
- **Carliner, S.** (2007.) How to buy electronic and classroom courses. VNU Business Media. TRAINING Solutions 2007. Salt Lake City, UT. October 15, 2007.
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- **Carliner, S.,** Cross, J., Siemens, G., Lamberson, S., & Metcalfe, D. (2006.) Straight talk. 2006 E-learning management colloquium. E-Learning Guild. Boston, MA. April 19, 2006.
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- **Carliner, S.** (2004.) What do you really need to know about ROI? E-learning instructional design symposium. E-Learning Guild. Chicago, IL. June 18, 2004.

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- **Carliner, S.** (2001.) Panel on upcoming trends in online learning and communication. Clearpoint Communications. Lexington, Massachusetts. October 31, 2001.
- **Carliner, S.** (2001.) Diverse philosophies for instructional design. VNU Business Media. Online Learning 2001. Los Angeles, October 2, 2001.
- **Carliner, S.** (2001.) 10 ways to use technology to support classroom learning. VNU Business Media. Online Learning 2001. Los Angeles, October 1, 2001.

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- **Carliner, S.** (1998.) Designing reusable information. East meets West. Hermes Softlab. Ljubljana, Slovenia. October 31, 1998.
- **Carliner, S.** (1998.) 25 tips for communicating online. Online Learning 1998. Lakewood Conferences and Asymetrix. Anaheim, CA. September 23, 1998.
- **Carliner, S.** (1998.) On-line or off the map? When online learning should work—and when it won't. Online Learning 1998. Lakewood Conferences and Asymetrix. Anaheim, CA. September 23, 1998.
- **Carliner, S.** (1998.) Taking a campaign approach to information design and development. New Media Instructional Design Symposium. Influent Technology Group. Chicago, IL. July 31, 1998.
- **Carliner, S.** (1998.) Do numbers really tell the story: Using qualitative analysis and evaluation techniques. Training Director's Forum. Lakewood Conferences. Ft. Lauderdale, FL. May 18, 1998.
- **Carliner, S.** (1998.) The elements of performance. IT Training Expo. Influent Technology Group. Chicago, IL. May 14, 1998.
- **Carliner, S.** (1998.) Do numbers really tell the story: Using qualitative analysis and evaluation techniques. TRAINING 98. Lakewood Conferences. Atlanta, Georgia. February 18, 1998.
- **Carliner, S.** (1998.) The elements of performance. TRAINING 98. Lakewood Conferences. Atlanta, GA. February 18, 1998.
- **Carliner, S.** (1997.) The elements of performance. TRAINING 97. Lakewood Conferences. Atlanta, GA. February 12, 1997.
- **Carliner, S.** (1997.) Do numbers really tell the story: Using qualitative analysis and evaluation techniques. TRAINING 97. Lakewood Conferences. Atlanta, Georgia. February 11, 1997.
- **Carliner, S.** (1997.) Choosing instructional technology. TRAINING 97. Lakewood Conferences. Atlanta, Georgia. February 10, 1997.
- **Carliner, S.** (1996.) The Technology Fair: Making the technology of training work for you. TRAINING 96. Lakewood Conferences. Atlanta, GA. January 31, 1996.
- **Carliner, S.** (1996.) Do numbers really tell the story: Using qualitative analysis and evaluation technique. TRAINING 96. Lakewood Conferences. Atlanta, Georgia. January 30, 1996.
- **Carliner, S.** (1996.) The instructional design fair. TRAINING 96. Lakewood Conferences. Atlanta, GA. January 30, 1996.
- **Carliner, S.** (1995.) Do numbers really tell the story: Using qualitative analysis and evaluation techniques. TRAINING 95. Lakewood Conferences. Atlanta, Georgia. February 16, 1995.
- **Carliner, S.** (1995.) How much technology do we really need to do our jobs? TRAINING 1995. Lakewood Conferences. Atlanta, Georgia. February 15, 1995.

- **Carliner, S.** (1994.) Do numbers really tell the story: using qualitative analysis and evaluation techniques. Training Director's Forum. Lakewood Conferences. Orlando, FL. May 24, 1994.
- **Carliner, S.** (1993.) Do numbers really tell the story: using qualitative analysis and evaluation techniques. Training Director's Forum. Lakewood Conferences. Orlando, FL. May 25, 1993.
- **Carliner, S.** (1992.) How to manage information overload. 1992 IBM AS/400 Technical Conferences. New Orleans, LA, July 15, 1992.
- **Carliner, S.** (1992.) How to manage information overload. 1992 IBM AS/400 Technical Conferences. Marco Island, FL, May 20, 1992.
- **Carliner, S.** (1991.) Effective presentations: Content. 1991 IBM AS/400 Technical Conferences. San Diego, CA. October 7, 1991.
- **Carliner, S.** (1991.) Effective presentations: Content. 1991 IBM AS/400 Technical Conferences. Lake of the Ozarks, MO. August 11, 1991.
- **Carliner, S.** (1991.) Effective presentations: Content. 1991 IBM AS/400 Technical Conferences. Orlando, FL. May 20, 1991.
- **Carliner, S.** (1991.) 25 techniques for developing computer-based training. Best of America Conference. Lakewood Publications. New York, NY. January 29, 1991.
- **Carliner, S.** (1990.) A three-step process to improving technical communication. 1990 IBM AS/400 Technical Conferences. New Orleans, LA. October 10, 1991.
- **Carliner, S.** (1990.) A three-step process to improving technical communication. 1990 IBM AS/400 Technical Conferences. San Francisco, CA. August 23, 1991.
- **Carliner, S.** (1990.) A three-step process to improving technical communication. 1990 IBM AS/400 Technical Conferences. Marco Island, FL. May 23, 1991.
- **Carliner, S.** (1990.) 25 techniques for developing computer-based training. Best of America Conference. Lakewood Publications. New York, NY. January 24, 1990.
- **Carliner, S.** (1989.) Telecommunicating through technical communication. 1989 IBM AS/400-System/38 Technical Conferences. San Antonio, TX, September 14 and Orlando, FL, July 21, 1989.

Conference Hosting

- **Carliner, S.** (2015.) Host, Trading Post. 2015 Canadian Society for Training and Development Conference and Trade Show. Toronto, ON: November 18, 2015.
- **Carliner, S.** (2015.) Host, Trading Post. 2013 Canadian Society for Training and Development Conference and Trade Show. Toronto, ON: November 13, 2013.
- **Carliner, S.** (2012.) Host. Research-to-Practice Day. 2012 Canadian Society for Training and Development Conference and Trade Show. Toronto, ON. October 31, 2012.
- **Carliner, S.** (2011.) Host. Applying Research in Practice Online Conference. Society for Technical Communication. Webcast. November 9, 2011.
- **Carliner, S.** (2010.) Host. Research-to-Practice Day. 2010 Canadian Society for Training and Development Conference and Trade Show. Toronto, ON. November 17, 2010.
- **Carliner, S.** (2009.) Host. Research-to-Practice Day. 2009 Canadian Society for Training and Development - International Federation of Training and Development

- Organizations World Conference. Toronto, ONT. October 20, 2009.
- **Carliner, S.** (2005.) Host. 2005 Training Director's Forum. VNU Business Media. Phoenix, AZ. May 23-25, 2005.
 - **Carliner, S.** (2005.) Host. 2004 Training Director's Forum. VNU Business Media. Phoenix, AZ. June 6-9, 2004.
 - **Carliner, S.** (2003.) Host. 2003 Training Director's Forum. VNU Business Media. Phoenix, AZ. June 8-11, 2003.
 - **Carliner, S.** (2002.) Host. Online Learning Asia 2002. VNU Business Media and Times Publishing. Singapore. May 15-17, 2002.
 - **Carliner, S.** (2001.) Host. Training Director's Forum. VNU Business Media. Las Vegas, NV. June 10-13, 2001.
 - **Carliner, S.** (2001.) Host. Online Learning Asia 2001. VNU Business Media and Times Publishing. Singapore. May 16-18, 2001.

TEACHING

Graduate Student Supervision

Students Who Have Graduated

Program	Student	Title and Presentation Date
PhD in Education (Supervisor)	Nadine Bekkouche	Challenges in Masters level education: Supervision, stress and mental health. Presented March 31, 2023.
	Yuan Chen	Exploring Instructors' Experiences with Instructional Design Supported Course Design in Higher Education: A Case Study Presented November 27, 2023.
	Alicia Piechowiak	Immigrant Onboarding in Non-Gateway Quebec Small to Medium Enterprises. Presented December 1, 2023.
	David William Price	Career Activity: Discussing Midlife Transitions as Strategic Activity Systems. Presented November 29, 2023.
PhD in Educational Technology (supervisor)	Salvador Garcia-Martinez	Using Commercial Games to Support Teaching in Higher Education. Presented April 2014.
	Jean-Marc Guillemette	An Exploratory Study of Participatory Design as an Alternative to Traditional Instructional Systems Design for Workplace Learning. Presented May 2012.

	Stuart Macmillan	Development of Writing for Research Purposes: An Ecological Exploration of Writing Process in a Linguistically and Culturally Diverse Class. Presented May 11, 2009.
	Ofelia Ribeiro	Becoming a Clinical Educator: An Exploration of What Clinical Educators Do and How They Prepare to Teach in a Healthcare Setting. Presented, November 6, 2014.
PhD in Education (committee member)	Michael Barcomb	Teachers as Customizers of CALL Resources: An Approach to Teacher Developed Digital L2 learning Materials. Presented March 2021.
	Alexandra Kindrat	Enhancing Seventh Graders' Relational Thinking Through Mental Mathematics. Presented January 2018.
	Souheila Mousalli	Exploring Intelligent Personal Assistants in Second Language Acquisition. Presented April 2022.
	Nadia Naffi	The Pedagogy of Understanding Oneself to Confront Social Media Propaganda Against the Resettlement of Syrian Refugees. Presented December 2017.
PhD in Educational Technology (committee member)	Patrick Devey	Survivor online courses: The road to better retention using survival analysis. Presented January 2009.
	Larysa Lysenko	Researching research use: An online study of school practitioners across Canada. Presented April 2010.
	Cinzia Miscio	Influence of Age, Computer Self-Efficacy, and Educational Level On Computer Training Outcome. Presented January 2014.
	Iolie Nicolaidu	Relating elementary students' process portfolios to writing self-efficacy and performance. Presented December 2009.
	Adnan Qayyum	Exploring students' course-related communication behaviour outside

		of postsecondary classrooms. Presented February 2010.
	Juan Carlos Sanchez-Lozano	Distributed information resources and embodied cognition in software application training: Interaction patterns in online environments and digital games . April 2010.
	Rana Tamim	Effects of technology on students' achievement: A second-order meta-analysis. Presented February 2008.
PhD Independent Study (committee member)	Goranka Vukelich	The inter-relationship of early childhood educators' curriculum beliefs, practices and professional identity. Presented November 2012.
PhD. External or Arms-Length Examiner	Isabelle Sperano	L'audit de contenu en architecture d'information : examen de la méthode à travers les écrits d'experts. Université Laval. Québec City, Québec. January 2017.
	Khishigbayar Tsogbadrakh	Intangible Capital Evolution Shaped by Higher Education: A Path Dependency Analysis on Mongolia. McGill University. August 2017.
	Elena Lvina	Political Skill in the Team Context: Team Political Skill Composition and Team Effectiveness. John Molson School of Business. Concordia University. June 30, 2011.
	Vanessa Rayner	Developing Preservice Teachers' Professional Noticing of Students' Learning. Concordia University. September 15, 2015.
M.A. in Educational Technology (thesis supervisor)	Nora Amer	The Unsung Heroes of Training and Development in Canada, The Administrators: A Content Analysis of Job Announcements. Presented November 13, 2023.
	Steven Avon	A Success Case of Training Transfer of a Blended, Technical Training Initiative. Presented August 2021.
	Naomi Burton-Macleod.	A Case Study of a Microlearning Follow-Up Initiative to Support Trainin Transfer. Presented August 2019.

		Study funded by the Tri-Council Canadian Graduate Scholarship - Masters program (SSHRC).
	Yuan Chen	Perceptions of E-books Among Students and Instructors in Higher Education. Presented September 1, 2015.
	Rachel Faust	Group Work at the College Level: A Case Study. Presented March 2021.
	Christian Glinel (Co-supervised with Giuliana Cucinelli)	Teaching 21st Century Skills: An Integrative Literature Review. Presented August 2020.
	Sheryl Guloy	A Call to Ownership: Three Volunteer Experiences Within a Religious Nongovernmental Organization (RNGO). Presented September 2006.
	Francoise Munger	Contingent Work: The Experience of Contractors in Learning and Development. Presented June 2017.
	David Price	Case Studies of Implementing Writing Courses Online in Higher Education. Presented August 2014.
	Haleh Raissadat	Effects of an Asynchronous Online Course on Safer Sex Practices of University-Age Young Adults." Presented March 2007.
	Kristina Schneider	A Qualitative Study of Five Bloggers of Five Blogs on Training and Development. Presented August 2008.
	Fauzia Sikender (Co-supervised with Giuliana Cucinelli)	The Main Types of Work-Integrated Learning Programs, Its Key Features, and Its Stakeholders' Responsibilities. Presented April 2022.
	Gabriel Smith	Playing Video Games in Japanese: Motivation, Language Learning, and Navigation. Presented April 2014.
	Melanie Wilson	An Investigation into the Effects of Orientation Interventions on Attrition for First-Time Distance

		Learners in Undergraduate Courses. Presented August 2007.
M.A. in Educational Technology (internship supervisor)	Adam Ashton	From Space to Switzerland: Reporting on Internships at the Canada Space Agency and the United Nations Institute for Training and Research. April 2012.
	Niloofar Bakhshae	Developing Online Training and Performance Support Tools at Bombardier Aerospace. December 2014.
	Ingy Bakir	Designing and Developing an Online Training Program for the Cleveland Clinic Academy. March 2011.
	Roman Barba	Internship at DECLic. Presented April 2016.
	Nathalie Benchitrit	Designing and Developing the Course, "Manager as Communicator" at Pratt & Whitney Canada. April 2008.
	Nicholas Birks	The Pratt & Whitney PFT e-Learning Course. September 2008.
	Irina Borcea	Quality Control of Training Materials: An Internship at Simgraph. Presented September 9, 2021.
	Mylene Bourrassa	CAMPUS-SPVM, un outil de formation virtuel. April 2010.
	Cameron Campbell	Implementing an E-Learning Program at Sonomax Hearing Healthcare. Presented March 2006.
	Chantal Castonguay	The ADDIE Model in Practise: Creating E-learning and in-Class Training Programs From A to E (at Industrial Alliance). Presented September 4, 2013.
	Nidia Cerna de la Torre	Preparing a Formative Evaluation and Instructional Design for the ABRACADABRA Website at the Centre for the Study of Learning and Performance. Presented February 2006.
	Sara Corena	Redesigning a Self-Study Online Course for The Meteorological

	Service of Canada (MSC). Presented April 2020.
Teyte Cottingham	Developing the FutureReady program at the Student Success Centre of Concordia University. Presented November 2019.
Elyse Croteau	Following the ADDIE Model Towards Videoconference training Solutions for Bell Canada. Presented March 20, 2013.
Cable Davis	Moving and Improving Instructional Content Online for GradProSkills. Presented September 9, 2021.
Heather DeLagran	Design, Human Rights Education, and the Learning Spiral. Presented September 2014.
Giancarlo DeLisi	SMART Work: Designing an Evaluation System and Other Resources for a New Employee Training System. Presented April, 2004.
Laraine Domingo	The Business Side of Instructional Design: An Internship at Pure & Applied. Presented December 2019.
Nancy Drab	Establishing an Organisational Learning and Effectiveness Department at Benjamin Moore & Co., Limited. Presented September 2005.
Catherine Farmer	Facilitating the Transition to a Redesigned Training Course at Air Canada Cargo. Presented December 2019.
Francois Gascon	Multiple Training Initiatives in a Human Resources Environment at Bombardier Aerospace. Presented April 2015.
Maria Ginsbourg	Internship with Language Instruction group at McGill University Continuing Education. Presented April 2016.
Larissa Gulka	<i>Learnability</i> in User Experience Research and Usability Testing. Presented March 2014.

	Jimmy Haddad	Developing an E-learning Course for the Group Insurance Division at Standard Life Assurance Company of Canada. Presented April 2007.
	Abdelali Hammouch	Designing E-Learning for Invensys University. Presented September 2005.
	Elizabeth Handfield	Increasing Inclusivity and Interactivity: Revising Training for the Canadian Aquatic Biomonitoring Network. Presented September 2022.
	Hannah Hassan	Compliance and Safety eLearning More Engaging at Air Canada. December 8, 2023.
	Graham Jack	Tips and Techniques for Taking a Template Based Approach to e-Learning. Presented April 2008.
	Arezou Jamshidi	eConExpress: Supporting Professors at Concordia University to On-Line Teaching. Presented December 2021.
	Anton Kassimov	Developing a User Guide for Course Creation Software. Presented September 2014.
	Jenny Kawadoi	Design and Development of Microworlds EX Supporting Materials for Grades 3 and 4. Presented April 2006.
	Carol Koo	Supporting Learning and Development in McGill University's Organizational Development in Human Resources. Presented December 2021.
	Jane Hebert-Koufos	One Journey, Two Internships: Designing Adult Learning Programs at Sonomax Hearing Healthcare and the Montreal Oral School for the Deaf. Presented December 2006.
	Wai Man Kwan	Developing the Learning Tool Kit at the Center of Study of Learning and Performance (CSLP) as a Support Instructional Designer. Presented September 2014.

Jeanine Lee	The Design in Instructional Design: eLearning Courseware Development in Healthcare Continuing Education and Training at LP3 Network, Montreal. Presented April 2020.
Alexandre LePierres	Starting my Professional Journey at Sma Transformation. Presented April 2017.
Donglin (Eric) Li	Design and Development of Distance Education for Airport Managers in the Field of Civil Aviation (at Aviation Strategies). Presented April 2013.
Yizhe Liu	Redesigning E-Learning Technical Software Programs at IBWave Solutions. Presented December 2019.
Monica Lopez	Alphie's Alley: The Design of an Electronic Performance Support System. Presented April 2004.
Keying Ma	Developing an Online Onboarding Program for New Faculty Members at a Cegep. Presented January 2020.
Matthew MacDonald	Aligning Goals: Using Web-Based Tools to Broaden a Naitonal Union's Educational Outreach (at the Canadian Union of Postal Workers (CUPW)). Presented March 2013.
Antonia Macris	Building Training for the Public Service. Presented December 2021.
Vanessa McCance	ADDIE Mashed Up: From Development to Analysis When Designing e-Learning. Presented April 2015.
Beverly Mitelman	Autonomous Language Learning: Approaches, Evaluation and Technology at the Canadian Forces Language School (CFLS). Presented March 2006.
Ghada Mohamed	The Design and Development of a Blended Training Solution in a Corporate Environment. Presented August 2004.
Ana Luisa Muniz	Instructional Design Experience at Bell Canada. Presented March 2021.

	Andrada Muntean	Internship at Bombardier Aerospace. April 2016.
	John Murray	Internship at Benchmark Performance. Presented August 2016.
	Sherry Newman	Knowledge for an Equitable World: Information and Communication Technologies in Educational Projects at the World University Service of Canada (WUSC). Presented March 2007.
	Cynthia Olivier	Internship at the Canada Military College. April 2016.
	Jennie Phillips	Seven Issues to Consider When Designing Training Curricula. Presented August 2009.
	Alison Piper	Training Financial Institution Employees to Identify and Prevent Money Laundering and Terrorist Financing. Presented August 2006.
	Tom Quily	Design of a Blended Learning Course. Presented April 2004.
	Carla Ravazzano	Designing eLearning at Simgraph. Presented May 2020.
	Michael Rutka	Conducting and Reporting a Training Needs Assessment and Developing a Learning Requirements Matrix for the Canadian Commercial Corporation. Presented April 2011.
	Darren Rapkowski	Writing Across the Curriculum: Tools to Differentiate the Process. Presented September 2004.
	Carla Ravazzano	Designing eLearning at Simgraph Presented April 2020.
	Mahmood Salehi Maman	Designing Elearning at Bombardier Aerospace. Presented April 2019.
	Anita Samuel-George	Coordinating Distance Learning Workshops and Developing a Curriculum Resource Catalog for the Canadian Space Agency. Presented August 2007.
	Caroline Selber-Hnatiw	Plan, Do, Reflect, Improve: Learning at the Canadian Consortium for the Investigation of Cannabinoids and the Centre for the Study of Learning

		and Performance. Presented April 2019.
	Monica Shah	Using Learning Analytics to Improve Learning Design at Algonquin College Online Campus. Presented March 2022.
	Nicholas Stratigopoulos	IT Service Management Project Developing a Training Curriculum for the Onboarding of New Employees into the Instructional and Information Technology Services (IITS) Department. Presented December 2014.
	Alexis Stylianou	Instructional Design in the Agency Environment: An Agile Experience at Studio 7 Communications. Presented August 2020.
	Haidee Thanda	Internship at Ontario Nurse Practitioner Association. Presented April 2016.
	Kathryn Urbaniak	The Instructional Design of Pharmaceutical Training Within a Vendor Environment (at IC Axon). Presented March 2013.
	Andre Valle	Transforming Information into Knowledge: Similar Practices in Web Development and Educational Technology. Presented December 2013.
	Riccardo Virone	KnowledgeOne Internship: Designing a Campus Safety Training Program. Presented April 2019.
	Yirong Wang	Design, Development and Delivery of Workplace Training in The Field of Aviation. Presented March 2020.
	Debbie Welch	The Total Learning Project at ST Microelectronics University: A New Process for Developing Training Projects. Presented August 2008.
	Stephanie Wells	Educational Technology in Practice: Instructional Design Applied at AllTrain and Marianopolis College. Presented December 2015.

	Micheli Cristina Werner	Developing Educational Materials for Human Rights Education Initiatives at the Equitas International Centre for Human Rights Education. Presented April 2019.
	Mengqi Xu	From Online Learning Development to Courseware Development: Internships at a Senior Centre and in the Aviation Industry. Presented November 2018.
	Lai Ling (Olivia) Yu	Strengthening Infrastructure: Selecting, Setting up and Managing a Learning Management System, and Creating a Website (at McGill University Health Centre). Presented April 2013.
	Aniklet Zefi	Appraising Programs and Developing Competency Frameworks at Concordia Continuing Education (CCE). September 2021.
	Yan Zheng	Online Multimedia Courseware Design and Development for the Faculty of UQAM and Instructional Design of Management Tools for IBM. Presented April 2007.
M.A. in Educational Technology except as noted (thesis committee member)	Emilie Bowles	In Survival Mode: Adult Education Teachers' Experience of COVID-19 and Their Use of Digital Technologies. Presented March 2022.
	David Jones	Education and AI: Opportunities and Apprehensions. Presented September 2021. (Directed study in the MA in Educational Studies.)
	Amber Judge	Disabilities and Virtual Worlds: An Exploration into the Experience of Learning about Self and Other. Presented August 2013.
	Natalia Matusevscaia	Students' Perceptions of Creative Teaching and Facilitation Techniques in Asynchronous Online Courses. Presented March 2016.

	William McCann	Translating Plain Language: An Inquiry into the Nature and Strategies for Successful Plain Language Translation. Presented September 2012. (M.A. in Etudes Francais.)
	Nadia Naffi	Learning to Exist in Social Media: A Grounded Theory About Lebanese Adolescents' Understanding of Their Interactions in Social Media, Their Impact on Their Everyday Life and the Behavior They Develop to Manage Them. Presented February 2012.
	Robert Taylor	A Blended Online Approach to Physical Education Instruction: A Combination to Enhance Student Cognitive and Physical Activity. 2007.
	Elizabeth Triassi	Shifting School's Climate to Enhance Emotional Intelligence for 21 st Century Learners - Our Digital Children. Case-Study #WeCare. Presented May 2018.
	Stephanie Vissa	Exploring the Effectiveness of Interventions Aimed at Promoting Collaboration Through Interactive Whiteboards and Google Apps for Education. Presented January 2016.

In-Progress Students

Program	Student	Status
PhD	Ingy Bakir	Started January 2018. Completing required course work. Dissertation will focus on internship supervision.
	Wenbin (Tony) Liu	Entered September 2019. Dissertation will focus on cultural factors in e-learning.
	Ezgi Ozyonum	(Co-supervised with Tanja Tajmel.) Entered September 2017. Entered into candidacy August 2021. Dissertation will focus on the internationalization of higher education in Canada.

		Received funding from the Fonds de Recherche du Quebec – Societe et culture Selected as a Concordia Public Scholar.
M.A. Educational Technology – Thesis Option	Tetiana Brandt	Project Management for e-Learning.
	Celia Johnston	Impact of virtual job fair events.
	Steven Phung	Started September 2018. Conducting a study of neuro-diverse workers.

Tutorials and Readings Courses (Independent Studies) (Includes Current and Past Students)

Program	Student	Topic	Term
<i>Ph.D. Tutorials</i>	Ofra Aslan	Advanced theory of instructional design, instructional systems design, and human performance technology	Winter 2005
		Interface design for children’s educational software.	Winter 2006
	Michael Barcomb	Foundations of Educational Technology	Fall 2016
	Ingy Bakir	Writing Research Reports	Fall 2019
		Integrative literature review: Internships	Winter 2018
	Nadine Bekkouche	Instructional design and educational technology theory	Winter 2020
	Colleen Bernard	Informal Learning	Spring 2011
		Researching the perceptions of training and development professionals.	Fall 2010.
		Theoretical foundations of instructional design and human performance technology: The great books.	Winter 2009

		Evaluating e-learning programs	Fall 2008
	Edward Bethel	Theoretical foundations of instructional design and human performance technology: The great books	Fall 2008
	Patrick Devey	Advanced theory of instructional design, instructional systems design, and human performance technology	Winter 2005
		Administration of educational technology units	Fall 2005
	Leelan Farhan	Winter 2020	Instructional design and educational technology theory
	Nicole Fournier-Sylvester	Foundations of Educational Technology	Fall 2013
	Salvador Garcia	Theoretical foundations of instructional design and human performance technology: The great books	Winter 2009
	Engida Gebre	Theoretical foundations of instructional design and human performance technology: The great books	Fall 2008
	Barbara Kerr	Knowledge management	Winter 2004
	Alexandra Kindrat	Foundations of Educational Technology	Fall 2013

	Patrick Labelle	Theoretical foundations of instructional design and human performance technology: The great books	Fall 2008
	Wenbin Liu	The construct of culture in human performance technology and professional and technical communication	Fall 2020
		Instructional design and educational technology theory	Winter 2020
		Cultural representations in the journals of technical communication and Human Performance Technology	Winter 2021
	Larysa Lysenko	Advanced design of e-learning	Fall 2005
	Cinzia Miscio	Advanced adult education theory.	Fall 2007
		Adult education theory and the older worker. (parts 1 and 2)	Winter 2008, Fall 2008
	Nadia Naffi	Informal learning, social media, and adolescents.	Fall 2014
	Ioana Nicolae	Foundations of Educational Technology	Fall 2013

	Jeannette Novakovich	Foundations of Educational Technology	Fall 2013
	Alicia Piechowiak	Integrative literature review, Human Resource Development	Winter 2019
		Human Resource Development and New Employee Onboarding	Fall 2018
	David Price	Career Development Theory	Fall 2015
		Instructional Design and Human Performance Technology Theory	Fall 2015
	Adnan Qayyum	Advanced design of e-learning	Fall 2005
		Informal learning	Winter 2006
	Alicia Piechowiak	Integrative literature review, Human Resource Development.	Winter 2019
	Ofelia Ribeiro	Administration of educational technology units	Fall 2005
	Hiba Sabri	Integrative literature review on consulting in training and development.	Fall 2011
		Theoretical foundations of instructional design and human performance technology: The great books	Winter 2009
	Juan Carlos Sanchez-Lozano	Study of the metrics used to assess the effectiveness and productivity of workplace learning and communication groups	Fall 2004

	Ross Sundberg	Foundations of Educational Technology	Fall 2016
	Rana Tamim	Advanced theory of instructional design, instructional systems design, and human performance technology	Winter 2005
	Angela Van Barneveld	Administration of educational technology units	Fall 2005
	Genny Villa	Knowledge management	Winter 2004
	Dai Zhang	Information design	Fall 2003
<i>M.A. Readings Courses</i>	Melanie Alter	Advanced instructional design project.	Summer 2015.
	Marci Araki	Qualitative and case study research	Fall 2006
	Adam Ashton	Terminology in educational technology	Fall 2010
	Leslie Bairstow	Advanced design of e-learning	Spring 2005
	Ingy Bakir	Analysis of training spending for the past 30 years	Winter 2009
	Tetiana Brandt	Literature review on project management in e-learning.	Summer 2023
	Tetiana Brandt	Research Methods II (taught as a tutorial rather than as a course)	Fall 2022
	Maria Sol Bursik	Reporting about recent innovations in educational technology	Fall 2020
	Naomi Burton-Macleod	Preparation for the literature review for her thesis proposal	Fall 2018
	Edward Bethel	Qualitative and case study research	Summer 2006
Kelly Boutilier	Research Methods II (taught as a tutorial	Winter 2022	

		rather than as a course)	
	Chantal Castonguay	Role of the performance consultant research project.	Summer 2013
	Catherine Clement	Research Methods II (taught as a tutorial rather than as a course)	Winter 2022
	Danielle Dennie	Learning data visualization and analysis through MOOCs	Spring 2019
	Angelo Georgekatos	Applying performance principles to the evaluation of school teachers	Summer 2006
	Emmy Huot	Research Methods II (taught as a tutorial rather than as a course)	Fall 2022
	Celia Johnston	Research Methods II (taught as a tutorial rather than as a course)	Fall 2022
	Maria Kanter	Usability testing and user-centered design	Fall 2008
	Samira Karim	Research Methods II (taught as a tutorial rather than as a course)	Fall 2022
	Patrick Leprohon	Advanced instructional design project.	Summer 2015
	Reisa Levine	Advanced design of e-learning	Spring 2005
	Alison Mazoff	Research Methods II (taught as a tutorial rather than as a course)	Fall 2022
	Lorne Novolker	Scenario-based experiential learning	Spring 2004

	Veronique Ong-Seng	Consistency guidelines for large online information projects	Spring 2004
	Alison Piper	Advanced design of e-learning	Spring 2005
	Stephen Phung	Research Methods II (taught as a tutorial rather than as a course)	Winter 2022
	David Price	Literature review on teaching writing online in higher education.	Winter 2014
	Tom Quily	Evaluation of the transfer of training	Fall 2003
	Anita Samuel-George	Qualitative and case study research	Summer 2006
	Gabriel Smith	Integrative literature review on interface design for games.	Fall 2011
	Ye Shu	Advanced instructional design project.	Summer 2015
	Raymond Taylor	Advanced design of e-learning	Spring 2005
	Liz Warwick	Designing performance support and e-learning for volunteer leaders of grassroots organizations	Summer 2013
	Melanie Wilson	Collaborative learning among learners in cross-institutional distance education	Winter 2006

Courses Taught at Concordia University

Level	Courses
Doctoral	<ul style="list-style-type: none"> Advanced Issues in Education (EDUC 809). Taught Fall 2017, Fall 2015. Advanced Seminar in Instructional Design and Human Performance Technology (taught for tutorial credit): Summer 2005, Academic Year 2008-2009, Fall 2013

	<ul style="list-style-type: none"> • Doctoral Seminar II (EDUC 801). 3 credits. (Fall/Winter 2014/2015, Fall/Winter 2012-2013). • Research Reports (ETEC 805). Winter 2008.
Master's	<ul style="list-style-type: none"> • Administering Educational Technology Units (ETEC 671/571). Fall 2020, Fall 2019, Fall 2018, Fall 2015, Fall 2014, Fall 2013. • Administration of Educational Technology Units for Education and Training Systems (ETEC 591/701). Taught Fall 2015, Fall 2014, Fall 2013, Fall 2012. Fall 2010, Winter 2009, Winter 2007, Summer 2005. • Formative Evaluation of Educational Materials (ETEC 536/636). Taught Fall 2004. • Fundamentals of Human Performance Technology (ETEC 651/551). Winter 2024. Winter 2015, Winter 2014. • Fundamentals of Instructional Design (ETEC 650/550). Fall 2020, Fall 2019, Fall 2018, Fall 2015, Fall 2014, Fall 2013. • Human Performance Technology (ETC 512/712). 6 credits. Currently teaching (Fall/Winter 2012-2013). Also taught Fall/Winter 2011-2012. Fall/Winter 2010-2011, 2008-2009, Fall/Winter 2007-2008. Fall/Winter 2006-2007, Fall/Winter 2005-2006, Fall/Winter 2004-2005, and Fall/Winter 2003-2004. • Human Resources Policies (ETEC 676). Winter 2019. • Knowledge Management (ETEC 693). Winter 2004. • Qualitative and Case Study Research (ETEC 646). Taught Summer 2006 (as a tutorial and readings course) and Fall 2003 (as a regularly scheduled course). • Topics in Human Performance Technology (ETEC 515/715). Taught Fall 2011.
Graduate Certificate	<ul style="list-style-type: none"> • Foundations of Teaching and Learning in Higher Education (TEAC 606) (3 credits). Fall 2021. • Foundations of Course Design in Higher Education (TEAC 607) (3 credits). Winter 2023, Winter 2022.
Bachelor's	<ul style="list-style-type: none"> • Designing Adult Learning Programs (ADIP 541/ADED344). Taught Fall 2007. • Designing Training Courses (ADED 498i). Winter 2006. • Diversity in Adults (ADED 403). Taught Winter 2005. • Educational Communication (EDUC 298a, ETEC 270). (through e-Concordia.) Summer 2020, Winter 2013, Fall 2012. Taught: Winter 2012, Fall 2011, Spring/Summer 2011, Winter 2011, Fall 2009, Spring/Summer 2009, Winter 2009, Fall 2008, and Summer 2008.

Courses Taught at Other Universities

University	Level	Courses
City University of Hong Kong	Master's	Visual Communication (EN 6960). Taught Fall 2002.
	Bachelor's	Technical and Professional Communication (EN 3560). Taught Fall 2002.
	Master's	<ul style="list-style-type: none"> • Effective Presentations. Taught Spring 2002.

Bentley College		<ul style="list-style-type: none"> • Knowledge-Based Systems (ID 7245). Taught Spring 2001.
	Bachelor's	<ul style="list-style-type: none"> • Advanced Content Development (BC 330) Also called Advanced Technical Writing. Taught Spring 2002, Spring 2001, Spring 2000. • Advanced Visual Communication (BC 340) Also called Publicity and Publications Production. Taught Spring 2002, Spring 2001, Spring 2000. • Design as Communication (COM 324). Taught Winter Inter-session 2002. • Fundamentals of Content Development (BC 230). Also called Technical and Professional Communication. Taught Fall 2001, Fall 2000, and Fall 1999. • Fundamentals of Visual Communication (BC 240). Also called Graphic Design. Taught Fall 2001, Fall 2000, and Fall 1999. • Managerial Communication (BC 320). Taught Fall 2001, Spring 2000.
	Information Design Certificate	<ul style="list-style-type: none"> • Designing the Online Learning Experience. Taught Spring 2000, Fall 2001. • Designing Performance Support Systems for Learning and User Assistance. Taught Spring 2001.
	Technical Communication Certificate	Visual Communication (TM 920). Taught Spring 2002, Fall 2001, Fall 2000, and Fall 1999.
University of Minnesota	Master's	Document Design (Rhetoric 5581). Taught Spring 1999. Winter 1999.
	Bachelor's	<ul style="list-style-type: none"> • Document Design (Rhetoric 3581). Taught Spring 1999. Winter 1999. • Newsletter (Rhetoric 3575). Taught Spring 1999 by instructional television. • Publications Management (Rhetoric 3574). Taught Winter 1999 by instructional television. Winter 1998 (classroom only). • Scientific and Technical Presentations (Rhetoric 3572). Taught Fall 1998 by instructional television.
Southern Tech	Master's	<ul style="list-style-type: none"> • Online Information. Taught Winter 1996, Fall 1992. • Instructional Design. Taught Winter 1995. • Document Design. Taught Winter 1996. Fall 1995. • Project Management. Taught Spring 1995.
	Bachelor's	Technical Writing I. Taught Spring 1996 (1 section). Winter 1996 (2 sections). Fall 1996 (2 sections).

University of International Business and Economics	Bachelor's	Integrated Corporate Communication. Taught 2019, 2018, 2017, and 2016.
International Summer School		

SELECTED PRESS COVERAGE

- Appel, S. (2023.) Returning to university as an adult. Radio Noon Quebec. CBC. September 1, 2023.
- Cassella, L. (2023.) Back to school for parents. Morning Show. Global TV Montreal. August 25, 2023.
- McTigue, B. (2022.) So you want to enroll in an eConcordia course? *The Link* (April 10, 2022). Viewed at <https://thelinknewspaper.ca/article/feature/so-you-want-to-enroll-in-an-econcordia-course>. Visited April 13, 2022.
- Clarke, L. (2021.) Concordia launches a Graduate Certificate in Teaching in Higher and Continuing Education, *Concordia Now* (May 28, 2021). Viewed at <https://www.concordia.ca/cunews/main/stories/2021/05/28/concordia-launches-a-graduate-certificate-in-teaching-in-higher-and-continuing-education.html?c=/news>. Visited July 30, 2021.
- _____ (2020.) A massive move to online instruction provides a challenge and an opportunity for Concordia's educational technology students, *The Suburban* (May 4, 2020). Viewed at https://www.thesuburban.com/life/education/a-massive-move-to-online-instruction-provides-a-challenge-and-an-opportunity-for-concordia-s/article_b91a1dd0-8d5b-11ea-9228-cfb159420198.html. Visited July 30, 2021.
- Lejtenyi, P. (2020.) A massive move to online instruction provides a challenge and an opportunity for Concordia's educational technology students, *Concordia Now* (April 29, 2020). Viewed at <https://www.concordia.ca/news/stories/2020/04/29/a-massive-move-to-online-instruction-provides-a-challenge-and-an-opportunity-for-concordias-educational-technology-students.html>. Visited July 30, 2021.
- Lindzon, J. (2018.) I want to be an instructional designer ... what will my salary be? *Globe and Mail*, (December 19, 2018). Viewed at <https://www.theglobeandmail.com/business/careers/career-advice/article-i-want-to-be-an-instructional-designer-what-will-my-salary-be/>. Visited January 9, 2019
- Dixon, G. (2017.) Four tips for adult digital learners, *Globe and Mail*, November 15, 2017. Viewed at <https://www.theglobeandmail.com/report-on-business/four-tips-for-adult-digital-learners/article36984396/>. Visited November 18, 2017.
- Banner, P. (2016.) A double-double career: A conversation with Saul Carliner, *Intercom*, 62(10). Viewed at https://www.stc.org/intercom/protected-content-2/?redirect_to=https%3A%2F%2Fstc.org%3A443%2Fintercom%2F2016%2F12%2Fa-double-double-career-a-conversation-with-saul-carliner%2F. Visited January 8, 2018.

- Chan, H. (2015.) Getting to know Saul Carliner, the Institute's latest fellow. *Institute for Performance and Learning*, December 17, 2015. Viewed at <http://performanceandlearning.ca/getting-to-know-saul-carliner-the-institutes-latest-fellow/>. Visited December 18, 2015.
- Peacock, T. (2014.) e.Scape Conference looks to the future of digital learning, *Concordia Now*, September 9, 2014. Viewed at <http://www.concordia.ca/content/shared/en/news/main/stories/2014/09/09...conferencelookstothefutureofdigitallearning.html?rootnav=news/stories> . Visited September 10, 2014.
- El-Ghazaly, S. (2013.) e-valuating e-learning. *Concordia magazine*, 37, 2, 36-39.
- Seidman, K. (2013.) e-Learning conference clicking on new education trends, *Montreal Gazette*, April 2, 2013. Viewed at <http://www.montrealgazette.com/news/learning+conference+clicking+education+trends/8185529/story.html>. Visited April 2, 2013.
- Rand, A. (2013.) Interview with Saul Carliner. CJAD-AM (Montreal). April 2, 2013.
- Karwatsky, P. (2013.) Earn a BA while never going to class. CTV Montreal, April 3, 2013.
- Stengel, G. (2012.) Outsourcing customer service may be penny wise and pound foolish. Published at *Forbes.com*, December 5, 2012. Viewed at <http://www.forbes.com/sites/geristengel/2012/12/05/outsourcing-customer-service-may-be-penny-wise-and-pound-foolish/> . Visited September 22, 2013.
- Peacock, T. (2012.) Fred Szabo's classroom of the future. *Concordia Now*, November 27, 2012. Viewed at <http://www.concordia.ca/now/what-we-do/teaching/20121127/fred-szabos-classroom-of-the-future.php>. Visited December 12, 2012.
- Brault, J. (2012.) Maudit courriel. *LesAffaires*, 24 novembre 2012. Viewed at www.lesaffaires.com/archives/generale/maudit-courriel/551557. Visited November 25, 2013.
- Peacock, T. (2012.) Carliner takes over e-learning fellowship. *Concordia Now*, October 30, 2012. Viewed at <http://www.concordia.ca/now/what-we-do/teaching/20121030/saul-carliner-takes-over-e-learning-fellowship.php>. Visited January 12, 2013.
- Rut, I. (2012.) Learn @ Work Week being celebrated across Canada. *Concordia NOW*. September 19, 2012. Viewed at <http://www.concordia.ca/now/what-we-do/research/20120919/learn-work-week-being-celebrated-across-canada.php>. Visited September 28, 2012.
- Morgan, L. (2012.) Learning at the water cooler. *Concordia Now*, August 28, 2012. Viewed at <http://www.concordia.ca/alumni-giving/alumni/news/announcements/2012/08/learning-at-the-water-cooler.php>. Visited January 12, 2013.
- Romita, J. (2012.) Communicating with Carliner. *Training Alliance Magazine*, June 2012. P.8-11.
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<http://www.theglobeandmail.com/servlet/story/RTGAM.20090223.wlinfo23/BNSStory/lifeWork/home>. Visited February 23, 2009
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<http://www.tufts.edu/alumni/magazine/winter2009/columns/people.html>. Visited December 21, 2008.
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<http://www.montrealgazette.com/Spare+gobbledygook/1098405/story.html>. Visited December 20, 2008.
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- Webb, Wendy. *Training Director's Forum*. May, 1999.
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- Minneapolitan joins the Jewish Peace Corps. *American Jewish World*. July 26, 1997.
- Cameroonian adventure for American. *Jerusalem Post*. October 14, 1996
- Filpczak, B. (1996.) Training on the cheap. *TRAINING*. 33(4).
- Barclay, Rebecca O. (1996.) Been there, done that, got the tee-shirt. *KM Briefs*.

REPRESENTATIVE ACADEMIC SERVICE

Service to Concordia University

University-Wide Service

- Facilitator for Conversations with Faculty. Initiative to visualize the future of teaching and learning. Winter 2022.
- Standing Committee on Sexual Misconduct and Sexual Violence. Representative from the Concordia University Faculty Association.
 - Since 2020.
 - Training and Education sub-committee of the Standing Committee on Sexual Misconduct and Sexual Violence. 2018-2020.
- Provost's Fellow for Digital Learning. 2012-2016.
- University Senate. Term 2: 2015-2018. Term 1: 2012-2015.
- Reviewer, Curriculum Innovation Awards. 2015, 2016.
- Academic Programs Committee. 2012-2018.
- Management-Labor Committee (liaison to the Concordia University Part-Time Faculty Association), 2013-2016.
- e.Scape 2013 Planning Committee. 2012-2013.
- Vice-Provost's Ad-Hoc Committee on Curriculum Innovation, 2011.
- Ad-hoc committee to evaluate student evaluations. 2010.
- Undergraduate Catalog Editorial Board. Member, since 2009.
- Ad-hoc committee to develop a University 101 program. Member, 2008-2009.
- Ad-hoc committee to harmonize Student Evaluations of Teaching across Faculties.
- Centre for Teaching and Learning Services. Taught Course Design Workshop (once in 2007, twice in 2006) as well as workshops on designing course websites.

Service to Faculty of Arts and Science

- Faculty Council. Since 2022.
- Faculty Council Steering Committee. Since 2022.
- Distinguished Professor Emeritus Committee. Since 2023.
- Search Committee, Selection Committee for Chair in Communications Studies. 2018.
- Faculty Curriculum Committee. Curriculum Committee. Member, 2012-2015, 2007-2009.

Service to the School of Graduate Studies

- Director, Graduate Certificate in Teaching in Higher and Continuing Education. 2021-2022.
- Director, Graduate Certificate in University Teaching. 2018-2021.

Service to the Department of Education

- Chair. Since June 2022.

- Chair's Advisory Committee. 2022.
- Chair (Interim), June 1, 2017 through June 30, 2018.
- Ad-hoc committee on budgeting. 2017-2018.
- Chair, Department Hiring Committees for tenure-track positions in disruptive pedagogies and learning architecture. 2018-2019.
- Curriculum Committee. Member, 2006-2007.
- Department of Education Steering Committee. Member, 2017-2022 and 2011-2016.
- Department of Education Communications Committee, Chair, 2017-2018 and 2015-2016.
- Department Personnel Committee, Member. Since 2020 and 2015-2016.
- Education Doctoral Committee. Program Director, 2011-2016. Member, 2010-2012.
- Policies and Procedures Ad Hoc Committee, co-Chair, 2003-2005.
- Research Committee, 2011-2012.

Service to the Educational Technology Program

- Director, 2018-2022.
- Program Committee, Member 2003-2022.
- M.A. Admissions Committee. Since 2018. Chair, 2004-2006, Member, 2007-2008.
- Ad Hoc Committee on Incorporating Portfolios into the Educational Technology Curriculum. Chair, 2005-2007.
- Ad Hoc Committee on Establishing a Distance Education Program. Member, 2005.
- Orientation. Chair, 2005, 2006, 2008.
- 50th Anniversary Committee. 2018-2019.
- 40th Anniversary Planning Committee. Chair, 2008-2009.
- Technology Showcase. Chair, 2009.

Service to the Centre for the Study of Learning and Performance

- Executive Committee. Member, 2003-2006
- Member. 2003-2009.

Service to the City University of Hong Kong

- Organized Information Design and Development Research 2003, an outreach event to the professional community. (Held February 2003.)
- Delivered research presentations on practical issues in technical communication. 2002-2003.
- Delivered workshops on:
 - Designing course websites. 2003.
 - Evaluating courses, 2003.

Service to Bentley College

- Business Communication Student Group. Advisor, 2000-2002.
- Undergraduate Program in Technical Communication. Chair, 1999-2002.
- MS, Human Factors in Information Design. Program Committee. Member, 1999-2002.
- English Department Colloquium Committee. Chair, 2000-2001.
- Social Committee. Member, 1999-2000.

- Delivered workshops on designing course websites for English department courses. 2000-2001.
- College Student Affairs Committee. Representative of the English Department, 2000-2001.
- College Curriculum Committee. Representative of the Information Design and Corporate Communication Department, 2001-2002.
- College0-Wide Sexual Orientation Action Team. Co-designed and co-facilitated workshop on integrating GLBT issues into the classroom. 2000. 2001.
- Ad-Hoc Committee on Establishing a Fine Arts Curriculum. Member, 2001-2002.
- Academic Technology Center. Taught workshops on designing course websites, 2000-2002.
- Breakfast at Midnight fundraiser. Volunteer, 2000-2002.

Service to the University of Minnesota

- B. S. Partnership Program in Technical Communication (a partnership coordinating a distance education program that jointly offered the B.S. in Scientific and Technical Communication degree at the University of Minnesota – Twin Cities, University of Minnesota – Crookston, Southwest State University, and the Rochester (Minnesota) University Center. Coordinator, 1998-1999.
- Industrial Affiliates Program. Co-Chair, 1997-1999.
- Rhetoric's Association of Students in Scientific and Technical Communication. Advisor, 1998-1999.
- Technology Committee. Member, 1998-1999.
- Delivered a workshop on teaching by interactive television for instructors that participate in all Partnership Programs. January 1999.
- Communicator's Forum. Keynote speaker at the annual conference, June 1999.

Service to Southern Polytechnic State University

- Scientific and Technical Communication Program. Program Committee, 1995-1996.
- Admissions Committee. Member, 1995-1996.

Service as an External Reviewer for Applications for Promotion

- Royal Roads University. Promotion from Associate to Full Professor. (2015.) Tenure and promotion from Assistant to Associate Professor. (2010.)
- University of Minnesota. Promotion from Associate to Full Professor. (2017.)
- York University. Tenure and promotion from Associate to Full Professor. (2012.)

REPRESENTATIVE PROFESSIONAL AFFILIATIONS

Professional Organizations

- **Society for Technical Communication:**
 - Board experience: International President, 1995-96; Immediate Past President, 1996-97; First Vice-President, 1994-95; Second Vice-President, 1993-94; Assistant to the President for External Relations, 1997-1998.
 - Committee experience: Member, *Intercom* Editorial Advisory Committee, Since 2016-. Chair, 2016-2018. Member, Kenneth Rainey Award for Excellence in

- Research Committee, 2015-2016. Member, Executive Director Search Committee, 2013. Organizer, Research-to-Practice Online Conference, 2011. Frank R. Smith Competition for Outstanding Journal Article Committee, Chair, 2010. Body of Knowledge Committee, Team Leader, Management Body of Knowledge, 2008-2009. Manager, Conferences, 2006-2007. Co-Manager, Governance Committee, 2002. Manager. Compensation Committee, 1999-2002. Judge, International Online Communication Competition, 2002, 2000 1999, 1998, 1997, 1995. Acting Manager, Leadership Development Committee, 1996-1997. Manager, Theme Campaign, 1992-1993. Nominating Committee, 1990-1992. General Manager, 1992 STC Annual Conference. Program Manager, 1989 Conference. Deputy Program Manager, 1988 Conference. Manager, Management and Professional Development Stem, 1986 Conference. Associate Editor for Audiovisual Communication, Technical Communication, 1987-1992. Founding Manager, Community Service committee, 1988-1990 (the work of this committee has been cited twice by the American Association of Society Executives). Judge, International Technical Communications Competition, 1992-1994.
- Special Interest Group (SIG) experience: Management SIG. Manager, 2001-2002.
 - Chapter experience: Twin Cities Chapter: Program Chair, FutureTense Conference, 1999. Coordinator, MegaMeeting (joint meeting of STC and several other professional organizations), 1997-1999. Atlanta Chapter: Program Manager, Currents conference 1993, 1990 and 1989. Manager, Nominating Committee, 1988. Manager, Community Service Committee, 1986-1988. Southeastern Minnesota Chapter: President, 1984-1986. Newsletter Co-editor, Southeastern Minnesota Chapter, 1982-1984.
- **STC Certification Commission.** Board of Directors, 2011-2013.
 - **Institute for Performance and Learning (formerly Canadian Society for Training and Development):**
 - Board experience: Board of Directors, 2007-2012. Chair, Steering Committee on Certification, 2008-2012. Chair, Research Day, 2010 Annual Conference. Chair, Research Day, 2009 International Federation of Training and Development Organizations / CSTD Joint Conference.
 - Chair, Certification Advisory Committee, 2015-2018.
 - Committee experience: Program Committee, Spring Symposium, 2004-2006. Research Committee, since 2005. Awards Committee, judge, 2005, 2006.
 - Quebec Chapter: Program Committee, Since 2021. Interim Vice-President of Programs and Events. 2004.
 - **International Society for Performance Improvement:**
 - Committee experience: Track Chair, Business of HPT Track, 2005 Annual Conference. Reviewer, 2003 and 2004 Annual Conferences. Program Committee, 1995 and 1994 Annual Conferences. Member, Performance Technology in the Community Committee. Performance Technology in the Community Special Interest Area, Chair, 1993 Annual Conference. Judge, TRAINING/ISPI Performance Technology in the Community Award, 1995-1997. Judge, New Systematic Application Competition, 1992. Co-Chair,

- Experimental Forums Track, 1991 Annual Conference. Judge, Chapter of Merit Competition, 1991. Coordinator, Poster Sessions, 1990 Annual Conference.
- Chapter experience: Atlanta Chapter: Senior Advisor, 1992-1993; President, 1991-1992; President-Elect, 1990-1991; Vice-President--Programs, 1989-90. Program Committee, 1992-95, 1988-89. Nominating Committee, 1988-89. Minnesota Chapter: Program Committee, 1996-1998.
- **Academy of Human Resource Development.** Member, since 2006. Member, Technology Committee, 2007-2008. Organizer, Town Meeting, 2008 Research Conference in the Americas.
 - **Academy of Management.** Member, since 2010. Human Resource Division, Practice-Liaison Committee. Co-chair, since 2010. Organizer, Research Meets Practice 2010.
 - **American Society for Training and Development.** Awards Committee, Reviewer, 2007-2011. Research Awards Committee, 2007-2008. Program Advisory Committee, International Conference and Exposition, 2003, 2004.
 - **Association for Computing Machinery Special Interest Group on Documentation.** Program Committee, 2007 Annual Conference.
 - **Association for Educational Communications and Technology.** AECT Publications Center of Excellence. Advisory Board – At-Large Member. Since 2023.
 - **Association for the Advancement of Computers in Education.** ED-MEDIA Program Advisory Committee, since 2015. Program Chair, ED-MEDIA Conference, 2015. Program Advisory Committee, since 2009. Program Chair, E-Learn 2007 Conference.
 - **Association of Teachers of Technical Writing.** Member. Since 2013 and 1998-2003.
 - **American Association of Museums.** Member. 1992-2004.
 - **Buckhead Business Association (Atlanta).** Leadership Development Programs, Class of 1993. Program Director, 1993-1994.
 - **Canadian Museums Association.** Member since 2009.
 - **Canadian Network for Innovation in Education.** President, Since 2021. Vice-President (2020-2021.) Conference Co-Chair, 2019-2021.
 - **Comité-conseil du programme Arts, lettres et communication.** Ministère de l'Éducation et de l'Enseignement supérieur du Québec. Representative from Concordia University. Since 2012.
 - **International Board of Standards in Training and Performance Improvement.** Board of Directors, 2019-2022.
 - **International Institute for Qualitative Methods.** Member-Scholar. Since 2010.
 - **Institute for Electrical and Electronic Engineers, Professional Communication Society.** Editor-in-Chief, *IEEE Transactions for Professional Communication*. 2011-2014.
 - **International Federation of Training and Development Organizations.** Chair, Research-to-Practice Day, 2010 World Conference.
 - **Quebec Association for Adult Learning.** Board of Directors, 2009-2011. Member since 2005.

Editorial Boards

- *Canadian Journal of Learning and Technology*. Since 2006.

- *E-learn magazine*. 2009-2012
- *Information Design Journal + Document Design*. 2004-2012.
- *IEEE Transactions on Professional Communication*. Editor-in-Chief, 2011-2016. Editorial Advisory Board, 2002-2009.
- *Journal of Workplace Learning*. Since 2021.
- *Online Learning Magazine*. VNU Business Media. Editorial Advisory Board. 2000-2002.
- *Performance Improvement Quarterly*. 2006-2012.
- *Technical Communication*. Associate Editor, Audiovisual Communication. 1987-1991.

Reviewer

- Research and granting agencies:
 - Atlantic (Canada) Opportunities Fund.
 - Canadian Council on Learning – Work and Learning Knowledge Centre
 - Centre for Workplace Skills.
 - College of Reviewers for the Canada Research Fund.
 - MITACS
 - Social Sciences and Humanities Research Council of Canada.
- Periodicals:
 - *Academy of Management Learning and Education*
 - *British Journal of Educational Technology*
 - *IBM Systems Journal*
 - *IEEE Transactions on Professional Communication*
 - *Information Design Journal + Document Design*
 - *Journal of Business and Technical Communication*
 - *Journal of Workplace Learning*
 - *New Horizons in Adult Education and Human Resource Development*
 - *Tech Trends*
 - *Technical Communication*
- Publishers:
 - ASTD Press.
 - John Wiley & Sons
 - Jossey-Bass/Pfeiffer
 - New Rider's
 - Pearson
 - Routledge
- Conferences
 - Academy of Management, 2011.
 - Academy of Human Resource Development, 2019, 2020, 2009.
 - American Educational Research Association, 2006-2007..
 - American Society for Training and Development International Conference, 2003-2004.
 - Canadian Society for Training and Development Annual Symposium, 2005-2006.
 - E-Learn. 2007.
 - ED-MEDIA. 2015.
 - International Society for Performance Improvement Annual Conference, 1991-1993, 2004-2005.

- Online Learning 2015, 2016.
- Society for Technical Communication Annual Conference, 1985-1989, 2006-2007.
- XD Gold Coast 2019 (sponsored by Griffith University in Australia).

REPRESENTATIVE COMMUNITY AFFILIATIONS

In Montreal, Quebec

- **Agence Ometz.** Board of Directors. 2012-2021. Immediate Past President, 2019-2021. President, 2016-2019. Vice-President. 2013-2016.
- **Association des coproprietes de 5545 a 5573 rue St-Denis.** Board. 2014-2018.
- **Carnegie Mellon University Alumni Association.** Order of the May. Since 2010.
- **EGALE.** Mentor to the Learning and Development team. 2020-2021.
- **Federation CJA.** Community Awards Committee, 2017. Evaluation Committee, Chair, 2011-2013. Governance Review Committee, Chair, 2008-2013. Social Services Agency Relations Committee, 2010-2012. Family and Young Adults Planning Committee, Co-Chair. 2009-2010. Identity and Community Planning and Allocations Committee, Co-Chair, 2006-2008. Education and Culture Planning and Allocations Committee, Vice-Chair, 2005; Co-Chair. 2005-2006; Member, 2003-2005. Federation Restructuring Effort, Chair, Sub-Committee on Youth and Young Adults, 2006. Quality Assurance Initiative, co-chair, 2004-2005.
- **Fringe Festival.** Actor, “Tacit Agreement,” June 2005.
- **GLBT International Theatre Festival.** Juror, 2004, 2005 English Playwriting Competition. Actor, An Evening of One-Acts, 2005. Actor, “Tacit Agreement” (November 2004).
- **Hebrew Free Loan Association.** Advisor, Governance. Since 2023.
- **Jewish Family Services.** Facilitator for annual board retreat, October 2007.
- **Mile End Chavurah.** Member. Since 2012. Board of Directors, 2016-2018. Human Resources Committee (since 2019). Finance Committee (since 2020).
- **Out for Business Conference.** Volunteer, 2006.
- **Yellow Door Choir.** Baritone, 2004.
- **University of Minnesota Alumni Association.** Lifetime member. Since 1998.

In Boston, Massachusetts

- **Am Tikva Synagogue.** Steering Committee, 2001-2002. Service leader, 1999-2002.
- **Brookline Commission for the Arts.** Vice-Chair, 2001-2002. Member, 1999-2002.
- **Greater Boston Business Council.** Member, 1999-2002.
- **Mollie Hirshberg Fund.** Secretary, 2001-2003. Board of Trustees, 1999-2003.

In Minneapolis-St. Paul, Minnesota

- **Downtown Minneapolis Neighborhood Association.** Chair, Development Task Force, 1996-1997.
- **OutFront Minnesota.** Co-Chair, The Connected Community Conference, 1997. Advisor, Education and Training Program, 1996-1999.
- **The Loft.** Member, 1995-2000.
- **Jewish Reconstructionist Federation.** Board of Directors, 1996-1998. Vice-President, Midwest. 1996-1998.

- **Jewish Vocational Services.** Board of Directors. 1998-1999.
- **Minneapolis Jewish Federation.** Harry Kay Leadership Development Program, Class of 1998. Hillel and Community Relations Panel, Chair, 1998-1999; Vice-Chair, 1997-98; Member, 1997. Objectives and Outcomes Committee, Chair, 1998-1999. Rimon (arts) Commission, Vice-Chair, 1997-1999. Young Leadership Study Series. 1996-97. Facilitator, revision of the mission statement, 1996-1997.
- **Minnesota Historical Society.** Member, 1995-1999.
- **Reconstructionist Rabbinical College.** Center for Jewish Ethics. Advisory Committee. 1995-1997.
- **Walker Art Center.** Member, 1986-2002.

In Atlanta, Georgia

- **Ahavath Achim Synagogue.** Leadership Development Program, 1990-91. Usher, 1987-1992.
- **Atlanta Jewish Federation.** Communications Advisory Board, 1986-1989.
- **Atlanta Jewish Heritage Center.** Co-chair of the Reverse Garage Sale for "Creating Community" exhibit, 1992-1995.
- **Atlanta Hungerwalk.** Walker, 1990-1992.
- **Congregation Bet Haverim.** Ritual Chair, 1993-1995.
- **Friends of Fernbank Natural History Museum and Science Center.** Chairman, 1990-1991; Second Vice-President, 1989-1990. Chair, 1989 Friends of Fernbank Seminar.
- **Siena Condominium Association.** Strategic Planning Committee, Manager, 1995.
- **Stage Door Players.** Board of Directors, 1992-94, 1988-1990. Secretary, Board of Directors, 1989-1990. Advisory Board, 1990-91. Director, "Too Tall, Too Young, in Tehran," 1990. Actor, 1988, 1987 One-Act Festivals.
- **Theatrical Outfit.** Moderator, Open Forum. 1987-1989.
- **Village Writer's Group.** Chairman of the Board, 1988-1989. Board of Directors, 1987-1989. Manager, 1989 Conference.
- **Zaban Shelter for Homeless Couples.** Overnight volunteer, 1990-1994.

In Rochester, Minnesota

- **B'nai Israel Synagogue.** Secretary, Board of Trustees, 1980-1982. Youth Group Director, 1981-83.
- **Citizen's Advisory on Transit.** Chair, 1985; Vice-Chair, 1984; Board Member, 1982-85.
- **Mantorville Melodramas.** Actor.; "Up the River without a Paddle(boat)." 1982.
- **Nordic Nomads.** Vice-President. 1987. Member, 1984-1987.
- **Off-Broadway Performing Company.** Board of Directors, 1982-1983. Actor: "The Fantastiks," 1982; "Seven Keys to Baldpate," 1982; "Romantic Comedy," 1981; "No Sex Please, We're British," 1981; "Love, Sex, and the IRS," 1981.
- **Olmsted County United Way.** Campaign Kickoff Breakfast Committee, 1984-85.
- **Rochester Civic Theater.** Board of Directors, 1985. Playreading committee: Chair, 1985; Member, 1983-85. Moderator, "Afterthoughts" discussion program, 1983-85. Actor: "Absurd Person Singular," 1983; "Whose Life Is It Anyway?" 1983;

“Unfamiliar Beds,” 1981; “Auntie Mame,” 1980.

- **Toastmaster’s.** Member, 1983-1986. Received Competent Toastmaster, 1985.

At Carnegie-Mellon University

- **THISTLE** (student yearbook). Editor-in-Chief, 1978-80. Layout Editor, 1978-79. (The 1980 yearbook was selected as a publisher's sample.)
- **TARTAN** (student newspaper). Managing Editor, 1978. News Editor, 1977-78. Reporter, 1976-77.
- **(University) President's Student Advisory Committee.** Member, 1979-80.
- **Humanities and Social Sciences College Council.** Student representative, 1978-80.
- **Peer Help Counseling Center.** Staff, 1977-80.

REPRESENTATIVE AWARDS

Most Significant Honors and Awards

- Award of Excellence and Innovation in Instructional Design. 2022 Awards Program of the Canadian Network for Innovation in Education. Shared with Vanessa McCance and Matthieu Guilbault. May 2022.
- SALTISE Best Practices and Pedagogical Innovators Award – University. 2021. SALTISE. June 2021.
- Merit Award. 2019-2020 Society for Technical Communication (STC) Alliance Competition for *An Overview of Training and Development: Why Training Matters*.
- *Intercom Award*: Outstanding Magazine Article for “Technical Communication at a Crossroads.” Society for Technical Communication, May 2016.
- Fellow, Canadian Society for Training and Development (now the Institute for Performance and Learning September 23, 2015). Elected: February 2015; Awarded, November 2015.
- Award of Distinguished Technical Communication for "What Measures of Productivity and Effectiveness Do Technical Communication Managers Track and Report?" (with Juan Carlos Sanchez-Lozano and Adnan Qayyum). 2014 Frank Smith *Technical Communication* Best Article Competition. 2015.
- Ken Rainey Award for Excellence in Research. Society for Technical Communication. 2014.
- Alumni Teaching Award, Concordia University Alumni Association, 2014.
- Jay R. Gould Award for Excellence in Teaching. Society for Technical Communication, 2014.
- Award of Distinguished Technical Communication – User Manuals for *Informal Learning Basics*. STC International Summit Awards, March 2014.
- Award of Distinguished Technical Communication – User Manuals for *Informal Learning Basics*. STC Chicago Summit Awards, January 2014.
- Award of Distinguished Technical Communication for " Using Business Models to Describe Technical Communication Groups." 2012 Frank Smith *Technical Communication* Best Article Competition. Society for Technical Communication. 2013.
- Provost’s Circle of Excellence. Concordia University. 2011.

- Award of Excellence. International Technical Publications Competition – Books Category. 2010.
- Best of Show and Award of Distinguished Technical Communication for Books. Technical Publications Competition of the Atlanta Chapter of Society for Technical Communication. 2010.
- Issue of the Year – Special Issue of Technical Communication on Electronic Performance Support Systems. (Guest editor.) 2002 Frank R. Smith *Technical Communication* Outstanding Article Competition. Society for Technical Communication. 2002.
- Best of Show - Outstanding Article of the Year. 2001 Frank R. Smith *Technical Communication* Outstanding Article Competition. Society for Technical Communication. 2001.
- Best of Show -- Outstanding Article of the Year. Society for Technical Communication. 2000 Frank R. Smith *Technical Communication* Outstanding Article Competition. Society for Technical Communication. 2000.
- Fellow, Society for Technical Communication. 2000
- Keith Wharton Award for Excellence in Teaching. Rhetoric's Association for Student Technical Communicators. University of Minnesota. 1999.
- Kappa Delta Pi (honor society for education students). 1989.
- Award of Distinguished Technical Communication for "Audiovisual Words: The Scriptwriter's Tools." 1986 *Technical Communication* Best Article Competition. Society for Technical Communication. 1987.

Other Honors and Awards

- Merit Award for *An Overview of Training and Development: Why Training Matters*. 2019-2020 Alliance Competition for the Society for Technical Communication.
- Outstanding Service Award for redesigning the Society for Technical Communication Annual Conference. Society for Technical Communication. 2007.
- Award of Excellence, Books Category. 2004 Technical Publications Competition of the Eastern Ontario chapter of the Society for Technical Communication, for *An Overview of Online Learning* (HRD Press, 2004). 2004.
- Award of Excellence, Books Category. 2004 Technical Publications Competition of the Eastern Ontario chapter of the Society for Technical Communication, for *Training Design Basics* (ASTD Press, 2003). 2004.
- Publication Award. Bentley College. 2001.
- Volunteer of the Year. Am Tikva Synagogue. 2001.
- Distinguished Chapter Service Award. Society for Technical Communication, Twin Cities chapter. 1999.
- President's Award. Society for Technical Communication. 1998.
- Associate Fellow, Society for Technical Communication. 1998.
- Award of Distinguished Technical Communication for "Finding a Common Ground: What STC Is and Should Be Doing to Advance Education in Information Design and Development." 1995 Frank Smith *Technical Communication* Best Article Competition. 1995.
- Doctoral Award. Department of Middle-Secondary Education and Instructional Technology. Georgia State University. 1995.

- Award of Achievement—Training Programs for *BellSouth Cellular Management Training Course*. 1995 Atlanta Society for Technical Communication Publications Competition. 1995.
- Award of Achievement—Books for *Techniques for Technical Communicators*. 1993. International Technical Publications Competition. 1993.
- Award of Distinguished Technical Communication—Books for *Techniques for Technical Communicators*. 1992 Huntsville Society for Technical Communication Publications Competition. 1992.
- Award of Merit—Books for *Techniques for Technical Communicators*. 1992 Atlanta Society for Technical Communication Publications Competition. 1992.
- Outstanding Service Award. Society for Technical Communication. 1992.
- Award of Merit—Brochures for *IBM Education: Part of Your Total System Solution*. 1991 Atlanta Society for Technical Communication Publications Competition. 1991.
- Award of Distinguished Technical Communication—Catalogs for *Your Guide to IBM Communications Systems Courses*. 1990 Atlanta Society for Technical Communication Publications Competition. 1990.
- Award of Merit—Articles for "What's Ahead in Technical Communication." 1990. Atlanta Society for Technical Communication Publications Competition. 1990.
- Award of Merit—Flyers for *IBM Main Courses: Catering to Your Educational Needs*. 1990 Atlanta Society for Technical Communication Publications Competition. 1990.
- Distinguished Chapter Service Award. Society for Technical Communication, Atlanta chapter. 1990.
- Carolyn Haskell Award. Atlanta Village Writer's Group. 1989.
- Outstanding Service Award. Society for Technical Communication. May 1989.
- PEACH Award. IBM Technical Education. 1986.
- Award of Distinguished Technical Communication—Show and Award of Excellence—Customer Manuals for the *IBM System/38 Problem Determination Guide*. 1983 St. Louis Society for Technical Communication Publications Competition. 1983

I. Biographical information

Employment History

TESL Programs Director	Concordia University	2012 to present
Senior Lecturer	Concordia University	2014 to present
Lecturer	Concordia University	2009 to 2012
Spain's Coordinator in Teacher Training Task Force	Spain's Ministry of Education & British Council Bilingual Project	2008 to 2012
Lecturer	Universidad de Valladolid, Spain	2007 to 2009
Primary English Teacher	Spain's Ministry of Education - British Council, UK	2000 to 2009

Academic Background

Ph.D.	Universidad Complutense de Madrid, Spain <ul style="list-style-type: none"> • Dissertation evaluated unanimously with 'Cum Laude' 	Jun. 2012
M.Ed. in Intercultural Communication	University of Pennsylvania, United States <ul style="list-style-type: none"> • GPA: 3.8 out of 4 	2000
M.A. in Sciences of Education	Universidad de Salamanca, Spain <ul style="list-style-type: none"> • Double Major: School Counseling and Special Education • First GPA ranking position in both major programs' cohorts 	1997

Languages

Spanish	Native speaker of Castilian-Spanish
English	Excellent proficiency in oral and written communication
French	Very good listening and reading skills. Conversational proficiency.

Fellowships, Awards and Appointments

• National team leader in teacher training task force for the Spain's Ministry of Education – British Council Bilingual Project	2010-2012
• On-site Practicum Supervisor for University of Worcester and University of Leeds, UK	2005-2009
• “La Caixa” Foundation Fellowship, Barcelona, Spain. Top-ranked grant bestowed by the King and the Queen of Spain to pursue higher education in the US.	1998-2000
• Educational Linguistics Program Fellowship, Graduate School of Education. University of Pennsylvania. Assistant in organizing Ethnography in Education International Conference.	1999-2000
• Sole student representative in the International Programs Committee. Appointed by the Dean of the Graduate School of Education, University of Pennsylvania.	1999-2000

- Department of Teaching and Research Methods in Education Fellowship, Universidad de Salamanca. Research and Teaching Assistant duties. 1996-1997
- Fellowship “Intercampus”, Universidad de Entre Ríos, Argentina. Research Assistant and Teaching Assistant duties for the Science of Education degree program. 1996

II. Research

Grants

Principal Investigator

Ministère de l’Enseignement supérieur, 2022-2023, “*Collaboration Interuniversitaire pour le développement d'une expérience immersive de formation à l'enseignement en réalité virtuelle*”, 24 950 \$ - awarded in competition.

Ministère de l’Enseignement supérieur, 2019 – 2023, “Soutien aux parcours de formation en sciences de l’éducation”, 600 000 \$, awarded to teacher education programs in Quebec.

Co-Investigator

CUPFA, 2020-2021, “Gamification of Reading Strategy Instruction in English as a second language”, 4 739.40 \$ - awarded in competition. Co-investigator: Pamela Gunning

Ministère de l’Enseignement supérieur, 2022-2023, “*Programme English Boot Camp*”, 14 350 \$ - awarded in competition. Co-applicant: Maria-Lourdes Lira-Gonzales

Research and Service projects

Principal Investigator

Concordia University - Lab for Innovation in Teaching and Learning & Knowledge One, 2020 – on going, “[*Let's try this again*](#)” [*Virtual Reality Scenarios in Teacher Education*](#).

Principal Coordinator

Concordia University – TESL Resource Centre, 2020 – on going, Retrieved March 8, 2023, from <https://www.concordia.ca/artsci/education/tesl-resource-centre.html>

Co-Investigator

Leadership Committee for English Education in Quebec (LCEEQ), 2020-2022, Accompaniment: Research to Practice. Retrieved March 8, 2023, from <https://lceeq.ca/en/accompaniment/update-page>

Publications

Gunning, P., Hernández González, T., White J, (2023). Implementing a Strategy Instruction Framework: Challenges of Classroom-Based Research at the Elementary Level. In M von Blanckenburg & C. M. Amerstorfer (Eds.), *Activating and Engaging Learners and Teachers: Perspectives for English Language Education*. Tübingen: Narr Francke Attempto.

Aitken, A., Hernandez Gonzalez, T., McPherson, H., Hollweck, T., & Baradaran, N. (2022). Accompaniment moments–Phase III report. A Report prepared for the Leadership Committee for English Education in Québec (LCEEQ), Québec.

McDonough, K., & Hernández González, T. (2018). Collaborative prewriting discussions and ESL students’ vocabulary development: LREs and depth of engagement. In M. Sato & S. Loewen (Eds.), *Evidence-based second language pedagogy: A collection of instructed second language acquisition studies*. New York: Routledge

- Hernández González, T., & McDonough, K. (2015). The effect of instructor stance on ESL speakers' language production in a conversation group setting. *System*, 55, 21-29.
- McDonough, K., & Hernández González, T. (2013). Language production opportunities during whole-group interaction in conversation group settings. In K. McDonough & A. Mackey, (Eds.) *Second language interaction in diverse educational contexts* (pp. 293-314). Amsterdam: John Benjamins.
- McDonough, K., & Hernández González, T. (2012) Conversation groups for ESL speakers: What language production opportunities do they provide? *Contact*, 38(2), 90-109.
- Hernández González, T. (2011). New Teaching? New Learning! In Teresa Hernández González (Ed.) *Retos de la Educación Bilingüe*. Madrid: Centro de Formación del Profesorado, Investigación e Innovación, Ministerio de Educación.
- Hernández González, T. (2011). Language use and language learning in CLIL classrooms [Review of the book *Language use and language learning in CLIL classrooms*, by Dalton-Puffer Christiane, Tarja Nikula, and Ute Smit (eds)]. *The Canadian Modern Language Review/La revue canadienne des langues vivantes*, 68(1), 104-106.
- Hernández González, T. (Ed.) (2011). *Retos de la Educación Bilingüe*. Madrid: Centro de Formación del Profesorado, Investigación e Innovación, Ministerio de Educación.
- Hernández González, T. (2009). Tecnologías al servicio de la Educación Bilingüe. In Miguel F. Ruiz Garrido and Ana M^a Saorín Iborra (Eds.) *Hacia una Educación Plurilingüe: Experiencias Docentes AICLE*. Castellón de la Plana: Publicacions de la Universitat Jaume I.
- Hernández González, T. (2009) "Assessment for Learning": Planning and implementation. In C. Alario Trigueros (Ed.) *Inmersión Temprana en Lenguas Extranjeras*. Santander: Universidad Internacional Menéndez Pelayo.

Conference Presentations (Since 2008)

- Hernandez Gonzalez, T.; Arora, R., Bakarally, S. (2022) *Let's try this again: Deliberate practice in teacher education using virtual reality scenarios*. SALTISE 11th Annual Conference, Montreal.
- Hernandez Gonzalez, T.; Gunning, P. (2021) *From Other-Regulation to Self-Regulation: Gamification of Language Learning Strategy Instruction*. Discussant at round table: Third Wind of Language Learning Strategies. World Congress of Applied Linguistics. Goningen, the Netherlands.
- Hernandez Gonzalez, T. (2021) *From Other-Regulation to Self-Regulation: Gamification of Language Learning Strategy Instruction*. CNIE/RCIÉ, Concordia University, Montreal, Canada.
- Hernandez Gonzalez, T; Collins, L (2020). *Gamification in Language Teaching: Beyond the Buzz*. TESOL Spain, Salamanca.
- Hernandez Gonzalez, T. & Gunning, P. (2019) *Success for all: Gamifying strategy-based instruction in language learning*. 3rd International Conference on Situating Strategy Use: Stepping into a New Era of Strategy Research and Practice. Osaka, Japan.
- Hernandez Gonzalez, T. (2019). *Gamification, more than points and badges: Using gamification to 'level up' research, teaching, and assessment*. Pre-conference workshop. American Association of Applied Linguistics, Chicago, US.
- Bures, E., Gunning, P., & Hernandez Gonzalez, T. (2019). *Integrating learning portfolios into your teaching: The messy world of applying active learning strategies*. Workshop facilitated at SALTISE Conference, Montreal, Quebec.
- Gunning, P., Hernandez Gonzalez, T., & Bures, E. (2019). *Ins and outs of using portfolios*. Workshop facilitated at Center for Teaching and Learning (CTL), Concordia University, Montreal, Quebec.

- McDonough, K., Hernandez Gonzalez, T., Lindberg, R. (2018, May). *ESL students' subsequent use of co-constructed L2 lexical knowledge*. Paper presented at the Canadian Association of Applied Linguistics / Association Canadienne de Linguistique Appliquée (CAAL/ACLA) conference, University of Regina, Regina, SK, Canada.
- Gunning, P., Hernandez Gonzalez, T., & Bures, E. (2018). *Case studies implementing portfolios into higher education to support the development of student competencies and self-regulated learning skills*. Workshop facilitated at SALTISE Conference, Montreal, Quebec.
- Hernandez Gonzalez, T. (2018). *Gamification as a refinement of pedagogy*. American Association of Applied Linguistics, Chicago, US.
- Hernandez Gonzalez, T. & Gunning, P. (2017). *Assigning readings and models to shape a student's approach to goal setting and reflection*. Workshop facilitated as part of the event Promoting critical thinking, creativity and self-regulated learning through the use of an e-portfolio at the Center for the Study of Learning Performance (CSLP)/Center for Teaching and Learning (CTL), Concordia University, Montreal, Quebec.
- Hernandez Gonzalez, T. (2017). *Gamification and TBLT: Combining two traditions in search of a refinement of pedagogy*. Paper presented at Task-Based Language Teaching International Conference, Barcelona, Spain
- Hernandez Gonzalez, T. (2017). *Gamifications as a refinement of L2 Pedagogy*. Paper presented at the American Association of Applied Linguistics Annual Conference, Atlanta, USA.
- Hernandez Gonzalez, T. (2016). *Competency-based programs in Quebec*. Summer Conference at Universidad de Valladolid, Valladolid, Spain.
- Hernandez Gonzalez, T. (2015). *Can evaluation be easier?* Workshop. SPEAQ on Campus conference at UQAM, Montreal, Canada.
- Hernandez Gonzalez, T. (2015). *Gamifying evaluation in the ESL classroom*. Workshop. SPEAQ Annual Convention, Montreal, Canada.
- Hernandez Gonzalez, T. (2014). *Gamifying Primary ESL classroom*. Workshop. SPEAQ on Campus conference at Université de Sherbrooke, Sherbrooke, Canada.
- Hernandez Gonzalez, T. (2013). *Trans-Atlantic Epistemological Conversations on Intercultural Education*. Paper presentation. Annual meeting American Anthropological Association, Chicago, USA.
- Hernandez Gonzalez, T. (2013). *Gamification in English as a Second Language Primary classrooms*. Workshop. SPEAQ Annual Convention, Montreal, Canada.
- Hernandez Gonzalez, T. (2013). *New literacy for new challenges*. Paper presented at SCIRA International Congress, Jönköping, Sweden.
- Hernandez Gonzalez, T. (2012). *Crossing borders in Intercultural Education: From theory to practice*. Paper presented at Annual meeting American Anthropological Association, San Francisco, USA.
- Hernandez Gonzalez, T. (2012). *Socio-linguistic practices of Gypsy Spanish women*. Paper presented at Association of Language Awareness International Congress, Montreal, Canada.
- Hernandez Gonzalez, T. (2011). *New teaching? New learning!* Plenary talk at Spain's Ministry of Education Annual Congress, Madrid, Spain.
- Hernandez Gonzalez, T. (2010). *There is nothing wrong with getting it right*. Workshop facilitated at Summer Conferences organized by Spain's Ministry of Education and British Council, Madrid, Spain.
- Hernandez Gonzalez, T. (2010). *Teaching students to self-regulate their thinking and learning*. Plenary talk in LEND International Convention on Assessment for Learning, Levico, Italy.
- Hernandez Gonzalez, T. (2009). *Outstanding Teachers or Outstanding Learners*. Workshop facilitated at SPEAQ Annual Convention, Montreal, Canada.
- Hernandez Gonzalez, T. (2009). *Helping pupils to become independent learners*. Workshop facilitated at the Center for Teaching Resources and Professional Development, Palencia, Spain.
- Hernandez Gonzalez, T. (2009). *Planning and Implementing Assessment for Learning*. Workshop facilitated for Spain's Ministry of Education and British Council Bilingual Project, Madrid, Spain.

- Hernandez Gonzalez, T. (2008). *What Makes our Pupils Learn Better?* Workshop facilitated for Spain's Ministry of Education and British Council Bilingual Project, Madrid, Spain.
- Hernandez Gonzalez, T. (2008). *Assessment for Learning?* Paper presented at Summer Conferences at Universidad Internacional Menéndez Pelayo, Cuenca, Spain.

III. University Teaching

Concordia University Pedagogy and practicum required courses in TESL programs.	2009 – present
Universidad de Alcalá de Henares, Madrid, Spain Required course for students in master's program in TESL.	2010 - present
Universidad de Valladolid, Palencia, Spain Pedagogy and practicum required courses for students in Teacher Education Undergraduate program.	2007 – 2009

Professional development for in-service ESL teachers in Quebec

Workshop: "English Bootcamp" Commission Scolaire de la Rivière-du-Nord	2018
Workshop: "English Bootcamp" Commission Scolaire de Samares	2017
Workshop: "English Bootcamp" Commission Scolaire des Laurentides	2016
Workshop: "Fostering autonomy with evaluation for learning" Commission Scolaire de Trois Lacs	2015
Workshop: "Gamification" Commission Scolaire de Montreal	2014

IV. Academic Service

Undergraduate Program Director	2012- present
<ul style="list-style-type: none"> • Coordination of evaluation of files and admission process in TESL programs: <ul style="list-style-type: none"> – B. Ed. Specialization in TESL (120 credits) in collaboration with TESL faculty and program administrator – TESL Certificate (30 credits) in collaboration with program administrator – Minor in TESL (24 credits) in collaboration with program administrator • Supervision of enrolment in TESL courses • Academic advising of TESL students (+250) • Scheduling for TESL courses • Update of documents related to procedures and evaluation for TESL internships • Supervision of Internship Placements for the B. Ed. in TESL program • Pedagogical assistance to and coordination of internship TESL supervisors (8) • Harmonizing learning objectives in TESL courses to comply with CAPFE recommendations • Creation and maintenance of Moodle TESL Metasite • Supervision of TESL Resource Centre (4 components and 8 employees) • Liaison with Maison de L`Amitié language center • Participation in Department of Education meetings • Participation in Department of Education Steering Committee 	

- Participation in Undergraduate Faculty meetings
- Participation in Concordia Teacher Education Council
- Participation in Part-time Hiring Committee for TESL and ESL courses

Assessor/Consultant

- Design of self-regulated learning e-portfolio for higher education (ePearl 4.0). Center for the Study of Learning and Performance. Montreal, Canada. 2017 – present
<https://www.epearl.ca/ecq/resources/teacher>
- Design of new program for Teacher Education degree with specialization in TESL within the Bologna Process for European Convergence Plans for Higher Education. University of Valladolid, Spain 2007 – 2010
- Evaluation of Programs for International Exchanges of Pre-service Teachers in TESL program. University of Valladolid, Spain, University of Leeds and University of Worcester, UK. 2008 - 2009

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Telephone: (514) 848-2424 x. 2017
Department Fax: (514) 848-4520

EMPLOYMENT HISTORY

- 2023 – present. Professor. Child Studies/Early Childhood and Elementary Education, Department of Education, Concordia University, Montreal, QC.
- 2016 – 2023. Associate Professor. Child Studies/Early Childhood and Elementary Education, Department of Education, Concordia University, Montreal, QC.
Parental leave from May, 2016 – May, 2017.
- 2011 – 2016. Assistant Professor. Child Studies/Early Childhood and Elementary Education, Department of Education, Concordia University, Montreal, QC.
Parental leave from March, 2013 – March, 2014.
- 2009 – 2010. Postdoctoral Fellow and Adjunct Researcher. Social Development Laboratory, Department of Psychology, University of Utah, Salt Lake City, UT.
2009. Statistical Consultant, Centre for Research in Human Development, Concordia University, Montreal, QC.
- 2006 – 2007. Statistical Analyst. Canadian Child Care and Curriculum Study, Department of Education, Concordia University, Montreal, QC.
- 2001 – 2003. Research Coordinator. Family Studies Laboratory, Department of Psychology, University of Waterloo, Waterloo, ON.
Principal Investigator: Hildy Ross
- 2000 – 2001. Research Assistant. Family Studies Laboratory, Department of Psychology, University of Waterloo, Waterloo, ON.
Principal Investigator: Hildy Ross

ACADEMIC BACKGROUND

- 2009 – 2010. Postdoctoral Research Fellow, Department of Psychology, University of Utah, Salt Lake City, UT.
- 2005 – 2009. PhD in Psychology, Centre for Research in Human Development, Concordia University, Montreal, QC.

Dissertation title: *Explaining variability in sibling conflict resolution strategies during middle childhood.*

2003 – 2005. M. A. in Psychology, Centre for Research in Human Development, Concordia University, Montreal, QC.

Master's thesis title: *Social-cognitive predictors of siblings' self-serving biases.*

1998 – 2003. Honors B. A. in Psychology and Applied Studies, University of Waterloo, Waterloo, ON.

Honour's thesis title: *Self-disclosure intimacy: When does target ethnicity have an impact?*

AWARDS AND SCHOLARSHIPS

Fellowships

2009 – 2011. Postdoctoral Fellowship, Social Sciences and Humanities Research Council of Canada (\$81000).

2009 – 2011. Postdoctoral Fellowship, Fonds de recherche sur la société et la culture du Québec (\$64000; Award declined).

2009. Doctoral Thesis Completion Award, Concordia University (\$4000).

2005 – 2008. Canada Graduate Scholarship, Doctoral Level, Social Sciences and Humanities Research Council of Canada (\$105000).

2005 – 2008. McConnell Graduate Fellowship, Concordia University (\$32400, in name only).

2004 – 2005. Postgraduate Scholarship, Master's extension, Natural Science and Engineering Research Council of Canada (\$17300).

2003 - 2004. Canada Graduate Scholarship, Master's level, Natural Science and Engineering Research Council of Canada (\$17500).

2003 – 2004. Centre for Research in Human Development Graduate Fellowship, Concordia University (\$6000, in name only).

2003 – 2004. Non-Resident Tuition Fee Remission, Concordia University (in name only).

2001 – 2002. Bryden Research Apprenticeship Award, University of Waterloo (\$1250).

Scholarships

2003. Robin K. Banks Scholarship, University of Waterloo (\$500).

2002. Richard H. Walters Psychology Memorial Award, University of Waterloo (\$400).

2000. Currie Scholarship, University of Waterloo (\$350).

1999 – 2002. Upper-Year Arts Scholarships, University of Waterloo (\$250 per year).

1998. Arts Faculty Entrance Scholarship, University of Waterloo (\$1000).

Prizes and Other Academic Honors

2009. Valedictorian, Faculty of Arts and Sciences, Concordia University (Honorary).

2009. Governor General's Gold Medal (University-wide competition for outstanding doctoral dissertation), Concordia University (Honorary).

2009. Doctoral Dissertation Award, Canadian Psychological Association (\$250 Prize).

2008. Poster Award, Social Cognition and Cognitive Science Research Day, Université de Québec à Montréal (\$600 Prize).

2005. Master's Thesis Award, Canadian Psychological Association (Honorary).

2003. Alumni Association Gold Medal, University of Waterloo (Honorary).

2003. Award for Distinguished Academic Achievement, Department of Psychology, University of Waterloo (Honorary).

2003. Honors Thesis Award, Canadian Psychological Association (Honorary).

LANGUAGES

English (Native); French (Fluent); Spanish (Basic)

PUBLICATIONS

*denotes undergraduate or graduate student co-author

Peer Reviewed Articles

Restrepo, A.*, Pareja Conto, L.*, **Recchia, H. E.**, Posada, R., Velez, G., Wainryb, C. (in press). Colombian youths' reasoning about retributive and restorative justice in the 2016 Peace Accord: Associations with trust. *Peace and Conflict*.

Tavassoli, N.*, **Recchia, H.**, & Dunfield, K. (2023). Children's and adolescents' judgments of the desirability and obligatoriness of prosocial action: Variations across helping, sharing, and comforting. *Cognitive Development*.

Tavassoli, N.*, Dunfield, K., Kleis, A., **Recchia, H.**, & Pareja Conto, L. (2023). Preschoolers' responses to prosocial opportunities during naturalistic interactions with peers: A cross-cultural comparison. *Social Development, 32*, 204-222. <http://doi.org/10.1111/sode.12620>

Saint-Martin, A.*, Badasu, M.*, **Recchia, H.**, Wainryb, C., & Dirks, M. (2023). Children's and adolescents' conversations with mothers about offenders' and victims' responsibility for harm in their experiences of being hurt by a peer. *Social Development, 32*, 135-151. . <https://doi.org/10.1111/sode.12618>

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- Savard, M., Badasu, M.*, & **Recchia, H.** (2021). Young mothers of Northern Uganda: A longitudinal study of individual and collective agency within a participatory program. *Peace and Conflict: Journal of Peace Psychology*, 27(4), 588–596. <https://doi.org/10.1037/pac0000489>
- Martin-Storey, A., Santo, J., **Recchia, H. E.**, Chilliak, S.*, Nardi, H., & da Cunha, J. (2021). Gender minoritized students and academic engagement in Brazilian adolescents: Risk and protective factors. *Journal of School Psychology*, 86, 120-132. <https://doi.org/10.1016/j.jsp.2021.03.001>
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Manuscripts Submitted for Publication

Pareja Conto, L., Velez, G., Restrepo, A., **Recchia, H.,** Posada, R., & Wainryb, C. (revise and resubmit). Colombian youths’ perspectives on the armed conflict and possibilities for ways forward. *Political Psychology*.

Conry-Murray, C., Dunfield, K., **Recchia, H.,** & Maranges, H. (revise and resubmit). *Harm is key to judgments that stealing is immoral*.

Peer Reviewed Encyclopedia and Book Chapters

Howe, N., Kinsley, C., & **Recchia, H.** (under contract). *Siblings and socio-emotional development*. In Développement social et émotionnel chez l'enfant et l'adolescent (2nd edition).

Velez, G., & **Recchia, H. E.** (submitted). Justice and fairness with a restorative lens for healing and peace. In R. Niemiec (Ed.), *Character strengths and peace psychology: Foundations and integration for science and practice*. Peace Psychology Book Series (D. J. Christie, Ed.), Springer.

Recchia, H. E., Sack, J. K., & Pareja Conto, L., & (revise and resubmit). Restorative justice as a context for moral education in K-12 schools. In L. Nucci, W. Thompson & T. Krettenauer (Eds), *Handbook of Moral and Character Education* (3rd Edition). Routledge.

Howe, N., & **Recchia, H. E.,** & Kinsley, C.* (2023; revised edition). Sibling relations and their impact on children’s development. In R. E. Tremblay, R. G. Barr, & R. Peters (Eds.), *Encyclopedia on early child development*. Centre of Excellence for Early Child Development.

- Recchia, H.,** Wainryb, C., & Pareja Conto, L*. (2022). Taking a developmental perspective on restorative justice in schools. In G. Velez & T. Gavrielides (Eds.), *Restorative justice: Promoting peace and well-being*. Springer.
- Recchia, H.,** & Wainryb, C. (2022). The role of conversations in moral development. In M. Killen & J. G. Smetana (Eds.), *Handbook of Moral Development*, 3rd edition. Routledge.
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- Wainryb, C., & **Recchia, H. E.** (2018). '¿Le golpeaste la cara contra el piso y la pateaste?': Conversaciones entre madres e hijos, y su contribución a la socialización moral. In A. Barreiro (Ed.), *Representaciones sociales, prejuicio y relaciones con los otros: La construcción del conocimiento social y moral* (pp. 107-125). Buenos Aires: UNIPE.
- Dirks, M. A., Dunfield, K. A., & **Recchia, H. E.** (2018). Prosocial behavior with peers: Intentions, outcomes, and interpersonal adjustment. In W. M. Bukowski, B. Laursen, & K. H. Rubin (Eds.) *Handbook of Peer Interactions, Relationships and Groups* (pp. 243-264). New York, NY: Guilford Press.
- Wainryb, C., & **Recchia, H. E.** (2017). Mother-child conversations about children's moral wrongdoing: A constructivist perspective on moral socialization. In N. Budwig, E. Turiel, & P. Zelazo (Eds.), *New perspectives on human development: Rethinking cognitive, social, and language & communicative Development* (pp. 182-208). Cambridge, UK: Cambridge University Press.
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Wainryb, C., & **Recchia, H. E.** (2013). Moral lives within cultures: Heterogeneity and conflict. In M. Killen & J. G. Smetana (Eds.), *Handbook of Moral Development*, 2nd edition (pp. 259-278). Mahwah, NJ: Erlbaum.

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Howe, N., & **Recchia, H. E.** (2006). Sibling relations and their impact on children's development. In R. E. Tremblay, R. G. Barr, & R. Peters (Eds.), *Encyclopedia on early child development*. Centre of Excellence for Early Child Development. Available at: <http://www.child-encyclopedia.com/Pages/PDF/Howe-RecchiaANGxp.pdf>.

Edited Volumes

Recchia, H. E., & Wainryb, C. (Eds.) (2021). *Revenge across Childhood and Adolescence*. Cambridge, UK: Cambridge University Press.

Wainryb, C. & **Recchia, H. E.** (Eds.) (2014). *Talking about right and wrong: Parent-child conversations as contexts for moral development*. Cambridge, UK: Cambridge University Press.

Other Publications (Not Peer Reviewed)

Wainryb, C., & **Recchia, H.** (2021). And if you wrong us, shall we not revenge? The value of grappling with the experience of revenge among youth. In *Revenge across Childhood and Adolescence*. Cambridge, UK: Cambridge University Press.

Recchia, H., & Wainryb, C. (2021). Understanding youths' retaliatory experiences through the lens of moral agency. In *Revenge across Childhood and Adolescence*. Cambridge, UK: Cambridge University Press.

Recchia, H., & Wainryb, C. (2021). Looking back and charting a course: Considering individual, interpersonal, and institutional contributions to the development of revenge in childhood and adolescence. In *Revenge across Childhood and Adolescence*. Cambridge, UK: Cambridge University Press.

Howe, N., & **Recchia, H. E.** (2014). Sibling relations and their impact on children's development (2nd edition). *Encyclopedia on early child development*. Centre of Excellence for Early Child Development.

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- Pasupathi, M., **Recchia, H. E.**, & Wainryb, C. (2010). Moral agency for all of us (letter to the editor). *Human Development*.
- Howe, N., Jacobs, E., Vukelich, G., & **Recchia, H. E.** (2007). *Canadian child care curriculum study*. Social Development Partnerships Program, Human Resources Development Canada.
- Recchia, H. E.** & Quance, A. (2008, October). Learning about learning: Perspectives on the Canadian Child Care Curriculum Study. In *Dialogue: Bulletin of the Centre for Research in Human Development, 2*, 3-5.
- Recchia, H. E.** (2008, February). Knowledge transfer is not enough: Intervention research in Bangladesh. In *Dialogue: Bulletin of the Centre for Research in Human Development, 1*, 2-3.
- Recchia, H. E.** (2004, April). Interview with Dr. William Bukowski. *Newsletter: CPA Section on Developmental Psychology, 24*, 4-5.

CONFERENCE PRESENTATIONS

Discussion Panels

- Velez, G., Payne, A.A., Pareja Conto, L.*, & Morrison, B., & (2021). In **H. Recchia**, *The Potential of Restorative Practices for Child and Adolescent Development*. Conversation roundtable presented at the biennial conference of the Society for Research in Child Development (online format).
- Fasoli, A., **Recchia, H. E.**, & Song, Q. (2017, June). *Parent-child conversations and processes of moral development*. Discussion panel at the annual meeting of the Jean Piaget Society, San Francisco, CA.
- Recchia, H. E.** et al. (2017, April). Discussion leader, moral development preconference, Society for Research in Child Development, Austin, TX.

Paper Presentations

- Perry Finch, C., Young, A., Pareja Conto, L*, Velez, G., & **Recchia, H.** (2023, October). *Exploring if and how school settings can use restorative practices to meet the needs of Black students*. An Antiracist Research Agenda to Advance Restorative Practices in PreK-12 Schools, Working Conference, San Francisco, CA.
- Pareja Conto, L.*, **Recchia, H. E.**, Velez, G., & Wainryb, C. (2023, June). *Socio-contextual variations in adolescents' reasoning about unambiguous situations of peer harm*. Paper presented at the annual meeting of the Jean Piaget Society, Madrid, Spain.
- Recchia, H. E.**, Pareja Conto, L., Restrepo, A., Velasquez, A-M., Velez, G., & Wainryb, C. (2023, March). *Adolescents' perspectives on school discipline: findings from mixed-methods*

studies in North and South America. Paper presented at the annual meeting of the American Educational Research Association, Chicago, IL.

Pareja Conto, L.*, Velasquez, A-M., Escorcía Vera, V.*, **Recchia, H.**, Velez, G., & Wainryb, C. (2023, April). Youths' understandings and judgments of teachers' responses to addressing peer harms in schools. In E. Baker & A. Dahl, *The developmental intertwining of aggression and morality: actions, judgments, and responses*. Symposium presented at the biennial meeting of the Society for Research in Child Development, Salt Lake City, UT.

Conry-Murray, C., **Recchia, H.**, Dunfield, K., & Maranges, H. (2022, June). *The role of harm in judgments of stealing*. Paper presented at the annual meeting of the Jean Piaget Society, Philadelphia, PA.

Recchia, H., Tolooei, N.*, Leclerc, G.*, Wainryb, C., & Dirks, M. (2022, June). *Children's conversations with their mothers about helping and being helped by their peers*. Flash talk presented at Development 2022, Calgary, AB.

Tavassoli, N.*, & **Recchia, H.** (2022, June). Children's and adolescents' prosocial judgments depend on the intensity of need and type of prosociality. In N. Tavassoli & H. Recchia, *Context sensitivity of prosocial decisions and judgments across development*. Symposium presented at Development 2022, Calgary, AB.

Pareja Conto, L.*, Restrepo, A.*, Velez, G., Escorcía, V.*, & **Recchia, H.** (2022, May). *Adolescents' Perspectives on the Colombian Armed Conflict and the 2016 Peace Accord*. Flash talk paper presented at Construction of the 'Other': Development, Consequences, and Applied Implications of Prejudice and Discrimination. Puerto Rico, USA.

Pareja Conto, L.*, & **Recchia, H.** (2022, May). A Phenomenological Analysis of Colombian Adolescents' Perceptions of Ideal Responses to Intergroup Harms in Schools. In R. Ilten-Gee (Chair), *Exploring Student Reasoning about Harm and Well-Being in School Programs and Curriculum: A Social Domain Theory Perspective*. Symposium presented at the annual meeting of the Canadian Society for the Study of Education (virtual format).

Scirocco, A.*, & **Recchia, H.** (2022, May). Links between adolescents' moral mindsets and narratives of their inconsistent and consistent moral value experiences. In M.-H. Véronneau & H. Recchia, *Transformations et transitions : La compétence émotionnelle au cœur du développement humain*. Symposium presented at the annual meeting of the Societe Quebecoise pour la Recherche en Psychologie, Mont Saint-Sauveur, QC.

Recchia, H., Guindon, J.*, Dirks, M., & Wainryb, C. (2021, November). *How are children's and adolescents' attributions linked to their judgments of perpetrators' and victims' culpability in peer conflict?* Paper presented virtually at 47th Annual Conference of the Association for Moral Education (AME).

Reid, M.*, **Recchia, H.**, & Mahon, A.* (2021, November) Navigating diverse perspectives: The longitudinal development of children's intellectual humility in philosophical dialogue. In N. Fletcher & H. Recchia, *Supporting youth in navigating contestable issues: Philosophical dialogues as a means away from epistemic rigidity toward a social justice*

- mindset*. Symposium presented virtually at 47th Annual Conference of the Association for Moral Education (AME).
- Tavassoli, N.*, Lier, C.*, **Recchia, H.** (2021, November). *To help or not to help: Reflections on past prosocial experiences are influential in motivating future intentions to act prosocially*. Paper presented virtually at 47th Annual Conference of the Association for Moral Education (AME).
- Saint-Martin, A.*, Borjian, A.*, **Recchia, H. E.**, Dirks, M., & Wainryb, C. (2021, June). *Should mothers encourage youth to take responsibility for protecting themselves from harm by their peers? Associations with psychosocial outcomes*. Paper presented at the annual conference of the Jean Piaget Society (online format).
- Ginsburg, J.*, Audley, S., & **Recchia, H. E.** (2020, October). *Young Children's Reasoning about Moral and Social-Conventional Issues Across Three Preschool Settings*. Paper presented at the annual conference of the Association for Moral Education (online format).
- Recchia, H. E.**, Commisso, M.*, Wainryb, C., & Dirks, M. (2020, October). *Children's and Adolescents' Evaluations of Blameworthiness in their Accounts of Peer Injury*. Paper presented at the annual conference of the Association for Moral Education (online format).
- Guindon, J.*, **Recchia, H.**, Dirks, M., & Wainryb, C. (2020, June). Maternal validation of emotion in response to the child's role in peer conflicts. In *Emotional Competence in Developmental Context from Childhood to Adulthood*. Centre for Research in Human Development.
- Reid, M.*, **Recchia, H. E.**, & Fletcher, N. (2020, June). *Navigating diverse perspectives: The longitudinal development of children's intellectual humility in philosophical dialogue*. Paper presented at the North American Association for the Community of Inquiry, Montreal, QC. *Conference postponed due to COVID*.
- Recchia, H. E.** (2019, November). *Two sides to every story? Children's social understanding and conflict resolution in close relationships*. Invited address in *From social cognition to social competence*, a preconference to the meeting of the Cognitive Development Society, Louisville, KY.
- Santo, J.B., **Recchia, H.E.**, Martin-Storey, A., & Da Cunha, J. (2019, June). *Self-Continuity Buffers the Effect of Peer Victimization on Depressed Affect among Brazilian Transgender Adolescents*. Paper presented at the annual meeting of the Jean Piaget Society, Portland, OR.
- Martin-Storey, A., Santo, J.B., **Recchia, H.E.**, Chiliak, S.*, Caetano Nardi, H., & Da Cunha, J. (2019, June). *Gender identity and academic engagement: Variation in the role of risk and protective factors across race in a large-scale sample of Brazilian adolescents*. Paper presented at the annual meeting of the Jean Piaget Society, Portland, OR.

- Recchia, H. E.,** Badasu, M.*, Commisso, M.*, Dirks, M., & Wainryb, C. (2019, June). *Negotiating responsibility for harm in mother-child conversations about peer conflict*. Paper presented at the annual meeting of the Jean Piaget Society, Portland, OR.
- Tavassoli, N.*, Dunfield, K., **Recchia, H. E.,** & Kleis, A. (2019, June). Preschool children's expressions of needs and prosocial engagement in two culturally diverse contexts. In N. Tavassoli* & **H. E. Recchia,** *Contextual factors that shape the early development of prosocial behavior*. Symposium presented at the annual meeting of the Jean Piaget Society, Portland, OR.
- Restrepo, A.*, & **Recchia, H. E.** (2019, March). Colombian Adolescents' Trust in Others: Links to Reasoning About Retributive and Restorative Justice. In H. Recchia, *Trust and Youth Development in Latin America: Findings from Colombia, Honduras, and Nicaragua*. Symposium presented at the biennial meeting of the Society for Research in Child Development, Baltimore, MD.
- Recchia, H. E.,** Wainryb, C., Restrepo, A.*, Gonzalez, O.-L.*, Inigo, F.*, & Posada, R. (2019, March). Coordination of revenge and forgiveness in Colombian adolescents' narrative accounts of peer injury. In K. McDonald & K. Frey, *Schadenfreude, Revenge and Forgiveness: How Teens React to Others' Misfortunes and Transgressions*. Symposium presented at the biennial meeting of the Society for Research in Child Development, Baltimore, MD.
- Recchia, H. E.** (2019, February). *Understanding adolescents' experiences of revenge and forgiveness*. Invited address: Bishop's University, Sherbrooke, QC.
- Recchia, H. E.,** Wainryb, C., & Posada, R. (2018, November). *Taking heed of children's and adolescents' lived experiences of revenge and forgiveness: Lessons learned*. Invited address: 2nd Annual CRDH Symposium on Knowledge Mobilization, Montreal, QC.
- Inigo, F.*, Gonzalez, O.-L.*, Restrepo, A.*, **Recchia, H. E.,** Wainryb, C., & Posada, R. (2018, May). Adaptive versus maladaptive experiences of forgiveness among urban Colombian adolescents: A qualitative analysis. In **H.E. Recchia,** *Threats to emotional competence from infancy through young adulthood: Risk and protective factors*. Symposium presented at Development 2018, St. Catharines, ON.
- Recchia, H. E.,** Bodington, M.*, Riedel, M.*, Wainryb, C., & Dirks, M. (2018, May). We always hurt the ones we love: Distinctions between angry and hurt feelings in children's narrative accounts of peer injury. In J. Peplak, *What Makes Some Children Respond in Kindness and Others in Hostility? Examining the Emotional Motivators for Social Behaviour*. Symposium presented at Development 2018, St. Catharines, ON.
- Restrepo, A.*, & **Recchia, H. E.** (2018, March). Colombian youths' understandings of justice in the context of the peace accord. In G. Velez, *Healing and Justice Over the Life Course: Addressing the Aftermath of Conflict in Colombia*. Symposium presented at the Psychology and Peace 2018 Conference, University of Notre Dame.

- Recchia, H. E.,** Wainryb, C., & Posada, R. (2017, April). I wanted to make him pay: Colombian youths' accounts of their own retaliatory actions. In *Children's and adolescents' experiences and judgments of revenge: Findings from the U.S., Colombia, and Pakistan*. Symposium presented at the biennial meeting of the Society for Research in Child Development, Austin, TX.
- Tavassoli, N.* & **Recchia, H. E.** (2017, April). "Can I have a bite of your apple?" Children's prosocial responsiveness to their siblings in early childhood. In *Getting along with siblings: Sibling other-orientedness as a context for socio-emotional development in early childhood*. Symposium presented at the biennial meeting of the Society for Research in Child Development, Austin, TX.
- Riedel, M.* & Bodington, M.* & **Recchia, H.,** Wainryb, C. & Dirks, M. (2017, March). She just makes me really mad and I won't talk to her anymore": Examining connections between emotions and responses to peer injury in children's and adolescents' narrative accounts. In *Le rôle des relations interpersonnelles au coeur du développement de la compétence émotionnelle*. Symposium presented at the annual meeting of the Societe Quebecoise pour la Recherche en Psychologie, Montreal, QC.
- Recchia, H. E.** (2017, March). *Talking about transgressions: The construction of moral agency in children's conversations with their mothers*. Invited address. Middlebury College, Middlebury, VT.
- Scirocco, A.* & **Recchia, H. E.** Wainryb, C., & Pasupathi, M. (2016, March). Talking to teens about transgressions: Adolescents' conversations with their mothers about hurting friends and siblings. In *The importance of mother-adolescent discourse in the development of adolescent morality*. Symposium to be presented at the biennial meeting of the Society for Research on Adolescence, Baltimore, MD.
- Recchia, H. E.** (2015, September). Colombian youths' experiences of revenge and forgiveness in peer conflict. Invited address as part of *Evento de inauguración del doctorado: Creciendo en medio de la adversidad y su relación con la moral*. Universidad Nacional de Colombia, Bogota, Colombia.
- Recchia, H. E.,** Scirocco, A.* & Wainryb, C., & Pasupathi, M. (2015, April). Children's and adolescents' experiences of hurting siblings and friends: Lessons about the development of moral agency and implications for moral socialization. In *Transgressing rules and hurting others: A developmental perspective from childhood to emerging adulthood*. Symposium organized by the Centre for Research in Human Development, Montreal, QC.
- Faulconbridge, O.* & **Recchia, H. E.,** Wainryb, C., & Pasupathi, M. (2015, March). Peer relationships as affective contexts for forgiveness among children and adolescents. In *La compétence émotionnelle de la petite enfance à l'adulte émergent : Avancement des connaissances [Emotional competence from middle childhood to emerging adulthood: Advances in current knowledge]*. Symposium presented at the annual meeting of the Société Québécoise pour la Recherche en Psychologie, Gatineau, QC.

Wainryb, C., **Recchia, H. E.**, & Posada, R. (2015, March). "I wasn't gonna turn the other cheek": School climate, victimization, and judgments of revenge and forgiveness in Colombian youths. In *"It's not so easy to forgive": Predictors and outcomes of forgiveness in diverse samples of children and adolescents*. Symposium presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.

Howe, N., DellaPorta, S.*, **Recchia, H. E.**, & Ross, H. (2015, March). Sibling teaching strategies across early childhood. In *The role of siblings in social development during early childhood*. Symposium presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.

Recchia, H. E., Peccia, S.*, & Rajput, A.* (2015, March). "I'm his big brother and he's jealous"; Children's descriptions of older and younger siblings' conflict goals. In *Power, control, and influence in sibling relationships across development*. Symposium presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.

Recchia, H. E., Wainryb, C., Posada, R., & Pasupathi, M. (2015, February). *Children's and adolescents' descriptions of desiring and seeking revenge*. Invited paper presented at the annual conference of the Centre for Research in Human Development, Montreal, QC.

Scirocco, A.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2014, May). Mother-child conversations about hurting friends and siblings as unique contexts for children's development. In *Children's informal learning in the context of close relationships*. Symposium presented at Development 2014, Ottawa, ON.

Scirocco, A.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2014, April). Mother-child conversations about hurting friends and siblings as unique contexts for children's development. In *Children's informal learning in the context of close relationships*. Symposium presented at the Graduate Symposium in the Department of Education, Concordia University, Montreal, QC.

Scirocco, A.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2014, March). Mother-child conversations about hurting friends and siblings as distinct contexts for the development of children's moral and emotional understandings. In *la role de la famille et des pairs dans le développement de la compétence émotionnelle de la petite enfance jusqu'à l'adolescence: progres et changements*. Symposium presented at the annual meeting of the Societe Quebecoise pour la Recherche en Psychologie, Montreal, QC.

Recchia, H. E., Wainryb, C., Bourne, S.*, & Pasupathi, M. (2013, April). "At least your intentions were good": Children's and adolescents' conversations with their mothers about transgressions in the moral domain. In *Children's and Adolescents' Domain-Specific Evaluations of Socialization, Parenting, and Family Life Across Cultures*. Symposium presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA.

Wainryb, C. & **Recchia, H. E.** (2013, April). Considering the complexities in adolescents' emotional experience in the aftermath of moral transgression. In *Emotions and Morality:*

Developmentally Integrative Approaches. Symposium presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA.

Martin-Storey, A., Peretti, M.*, & **Recchia, H. E.** (2012, March). Harassment due to gender non-conformity and depression: The moderating role of self-continuity. In *Pathways to resilience for sexual minority youth: Individual and school-based factors that mediate and moderate school harassment*. Symposium presented at the biennial meeting of the Society for Research on Adolescence, Vancouver, British Columbia, Canada.

Wainryb, C., **Recchia, H. E.**, & Pasupathi, M. (2011, March). Helping and hurting: The construction of moral agency in children's conversations with their mothers. In *Parent-child conversations as contexts for moral development*. Symposium presented at the biennial conference of the Society for Research in Child Development, Montreal, QC.

Jacobs, E., Howe, N., **Recchia, H.**, & Vukelich, G. (2009, May). *Constructivist curriculum and professional development*. Presentation to the Manitoba Child Care Association, Winnipeg, MB.

Recchia, H. E., & Howe, N. (2009, May). *Sibling conflict in middle childhood: Links with parental interventions, social understanding, and relationship quality*. Paper presented to the Narrative Research Group, Department of Psychology, University of Lancaster, UK.

Recchia, H. E., & Ross, H. (2009, April). Explaining variability in family conflict negotiation strategies: Associations with power and relationship quality. In *Methodological advances in family research*. Symposium presented at the biennial conference of the Society for Research in Child Development, Denver, CO.

Recchia, H. E., Martin-Storey, A. K., Bukowski, W. M., Santo, J. B., & Meyer, F. (2008, June). The self through time: Associations between content & consistency of the self, and pre-adolescent anxiety & depression. In *Individual and cultural perceptions of self through time: Associations with adolescent depression and suicide*. Symposium presented at the annual conference of the Jean Piaget Society, Québec City, Canada.

Santo, J. B., Martin-Storey, A. K., **Recchia, H. E.**, & Bukowski, W. M., & (2008, June). Self-continuity moderates the association between peer victimization and depression. In *Individual and cultural perceptions of self through time: Associations with adolescent depression and suicide*. Symposium presented at the annual conference of the Jean Piaget Society, Québec City, Canada.

Recchia, H. E., Howe, N., & Alexander, S.* (2007, April). Sibling teaching in early and middle childhood. In *Selected topics in child development: Perspectives from Canada*. Colloquium presented in the Department of Psychology, Universidad de los Andes, Bogotá, Colombia.

Recchia, H. E., Howe, N., Ross, H., & Alexander, S. A.* (2006, September). Children's use and understanding of verbal irony in family conversations. In *Hot topics in child development*, Centre for Research in Human Development colloquium series, Montréal, QC.

Recchia, H. E., Howe, N., & Alexander, S. A.* (2005, April). “You’re determined to fall on your nose”: Children’s understanding and production of verbal irony in family conversations. In *What can we make of what children make of irony?: Findings from Canada, U.S., U.K. and Japan*. Symposium presented at the biennial conference of the Society for Research in Child Development, Atlanta, GA.

Recchia, H. E., & Kunda, Z. (2003, May). *Self-disclosure intimacy: When does target ethnicity have an impact?* Paper presented at the annual Ontario undergraduate thesis conference, Waterloo, ON.

Poster Presentations

Tolooei, N.*, **Recchia, H. E.,** Leclerc, G.*, Wainryb, C., & Dirks, M. (2023, April). *Elementary school-aged children’s conversations with their mothers about prosocial experiences with peers*. Poster presented at the biennial meeting of the Society for Research in Child Development, Salt Lake City, UT.

Pareja Conto, L.*, Velasquez, A., Escorcía Vera, V.*, **Recchia, H.,** Velez, G., & Wainryb, C. (2023, April). *Teachers and students’ perspectives on responses to address peer harm in schools*. Poster presented at the biennial meeting of the Society for Research in Child Development, Salt Lake City, UT.

Kinsley, C.*, Dirks, M., & **Recchia, H.** (2023, April). *Daily associations between emotions and interactions between siblings in middle childhood*. Poster presented at the biennial meeting of the Society for Research in Child Development, Salt Lake City, UT.

Adler, Z.*, Tavassoli, N.*, & **Recchia, H.** (2023, April). *Parents’ perspectives on the risks of their children’s prosocial actions and refusals*. Poster presented at the biennial meeting of the Society for Research in Child Development, Salt Lake City, UT.

Leclerc, G.*, Tavassoli, N.*, & **Recchia, H.** (2022, June). *Parent’s views on self- and other-oriented lessons to be learned from children’s prosocial experiences*. Poster presented at Development 2022, Calgary, AB.

Kinsley, C.*, **Recchia, H.,** & Dirks, M. (2022, June). *Families’ Perspectives on Daily Sibling Interactions in Middle Childhood*. Poster presented at Development 2022, Calgary, AB.

Guindon, K.*, Melara, X.*, **Recchia, H.,** Dirks, M., & Wainryb, C. (2022, June). *Children’s and adolescents’ explanations for judgments of their own and others’ blame in peer conflict*. Poster presented at Development 2022, Calgary, AB.

Kinsley, C.*, **Recchia, H.,** Howe, N., & Dirks, M. (2021, June). Taking the temperature: Associations between sibling relationship quality and reports of daily interactions in preadolescence. Poster presented at the annual conference of the Jean Piaget Society (online format).

Borjian, A.*, Saint-Martin, A.*, **Recchia, H.,** Wainryb, C., & Dirks, M., (2021, June). Children’s Attributions for Their Peers Transgressions Towards Them: Links to Age and Experiences

of Chronic Victimization. Poster presented at the annual conference of the Jean Piaget Society (online format).

Marlandis, A.*, Guindon, J.*, **Recchia, H.**, Dirks, M., & Wainryb, C. (2021, June). Children's and Adolescents' Coping Strategies in Response to Peer Injury: The Role of Maternal Emotion Socialization. Poster presented at the annual conference of the Jean Piaget Society (online format).

Pirro, T.*, **Recchia, H.**, Wainryb, C., & Dirks, M. (2021, June). Is and ought: Mother-child disagreements about facts and values when discussing peer conflicts. Poster presented at the annual conference of the Jean Piaget Society (online format).

Guindon, J.*, **Recchia, H.**, Wainryb, C., & Dirks, M. (2021, April). *Youths' blame attributions to victims and perpetrators: Associations with age and peer conflict role*. Poster presented at the biennial conference of the Society for Research in Child Development (online format).

Pareja Conto, L.*, Restrepo, A.*, **Recchia, H.**, Velez, G., & Wainryb, C. (2021, April). *Colombian Adolescents' Evaluations of Retributive and Restorative Approaches to Address Harms in Schools*. Poster presented at the biennial conference of the Society for Research in Child Development (online format).

Tavassoli, N.*, & **Recchia, H.** (2021, April). *The Role of Individual and Situational Factors in Children's and Adolescents' Prosocial Judgments*. Poster presented at the biennial conference of the Society for Research in Child Development (online format).

Scirocco, A.*, & **Recchia, H. E.** (2019, June). *Mothers' and adolescents' perspectives on parental feedback in positive and negative moral situations*. Poster presented at the annual meeting of the Jean Piaget Society, Portland, OR.

Pawelczyk, C.*, Tavassoli, N.*, & **Recchia, H. E.** (2019, March) *Young adults' reasons for being glad or not glad after helping others*. Poster presented at the annual meeting of the Société Québécoise pour la Recherche en Psychologie, Mont Tremblant, QC.

Guindon, J.*, **Recchia, H. E.**, Wainryb, C., & Dirks, M. (2019, March). *Aider les enfants et les adolescents à gérer des blessures par leurs pairs: Le rôle de la socialisation maternelle des stratégies d'adaptation*. Poster presented at the annual meeting of the Société Québécoise pour la Recherche en Psychologie, Mont Tremblant, QC.

Badasu, M.*, Saint-Martin, A.*, **Recchia, H. E.**, Dirks, M., & Wainryb, C. (2019, March). *How do mothers attribute blame in children's varied experiences of being harmed by a peer?* Poster presented at the annual meeting of the Société Québécoise pour la Recherche en Psychologie, Mont Tremblant, QC.

Silva Latorre, S. J.*, Restrepo, A.*, & **Recchia, H. E.** (2019, March). *Colombian youths' evaluations of restorative and retributive justice: Associations with support for the 2016 peace agreement*. Poster presented at the annual meeting of the Société Québécoise pour la Recherche en Psychologie, Mont Tremblant, QC.

- Commisso, M.*, **Recchia, H. E.**, Dirks, M., & Wainryb, C. (2019, March). *Attributions of Culpability: Mothers' and Children's Perspectives, and the Effects of Mother-Child Conversations*. Poster presented at the biennial meeting of the Society for Research in Child Development, Baltimore, MD.
- Restrepo, A.*, & **Recchia, H. E.** (2019, March). *Colombian Youths' Reasoning about Justice in Intergroup Conflict: Associations with Severity and Reparability of Harm*. Poster presented at the biennial meeting of the Society for Research in Child Development, Baltimore, MD.
- Carney M., Moreira da Cunha, J., Saldarriaga, L.M., Martin-Storey, A., **Recchia, H.**, Santo J.B. & Bukowski, W.M. (March, 2019). *Collectivism Influences the Moderating Effect of Self-Continuity on the link between Victimization and Depressed Affect*. Poster presented at the biennial meeting of the Society for Research in Child Development, Baltimore, Maryland, U.S.A.
- Scirocco, A.*, Royea, C.*, **Recchia, H.**, Wainryb, C., & Pasupathi, M. (2018, November). *How do mothers convey mindset in conversations about their children's helping behavior?* Poster presented at the annual meeting of the Association for Moral Education, Barcelona, Spain.
- Tavassoli, N.*, Renauld, J.*, **Recchia, H. E.**, & Ross, H. (2018, November). *Parental interventions to promote siblings' prosociality in naturalistic interactions: From identifying a need to provoding motivation*. Poster presented at the annual meeting of the Association for Moral Education, Barcelona, Spain.
- Recchia, H. E.**, Wainryb, C., Restrepo, A.*, Gonzalez, O.-L.*, Inigo, F.*, & Posada, R. (2018, June). *The juxtaposition of revenge and forgiveness in Colombian adolescents' accounts of peer conflict*. Poster presented at the annual meeting of the Jean Piaget Society, Amsterdam, NL.
- Renauld, J.*, **Recchia, H. E.**, Wainryb, C., & Dirks, M. (2018, June). *Subjective and objective aspects of harm severity in children's narrative accounts of peer victimization*. Poster presented at the International Congress of Applied Psychology, Montreal, QC.
- Renauld, J.*, Tavassoli, N.*, **Recchia, H. E.**, & Ross, H. (2018, May). *Parental interventions eliciting prosocial behaviors between siblings in early childhood*. Poster presented at Development 2018, St. Catharines, ON.
- Tavassoli, N.*, **Recchia, H. E.**, & Ross, H. (2018, May). *Firstborn and secondborn siblings' expressions of need and prosocial responses in naturalistic interactions*. Poster presented at Development 2018, St. Catharines, ON.
- Recchia, H. E.**, Riedel, M.*, Bodington, M.*, Wainryb, C., & Dirks, M. (2017, June). *There's a part of me that is still really angry: Children's and adolescents' experiences of different emotions in the context of peer injury*. Poster presented at the annual meeting of the Jean Piaget Society, San Francisco, CA.
- Inigo, F.*, **Recchia, H. E.**, Wainryb, C., & Posada, R. (2017, June). Intrapersonal and interpersonal dimensions of Colombian youths' forgiveness experiences: Links to school

climate and exposure to violence. Poster presented at the conference of the Canadian Psychological Association, Toronto, ON.

Bodington, M.*, Riedel, M.*, **Recchia, H. E.**, Wainryb, C., & Dirks, M. (2017, June). Children's and adolescents' narrative accounts of peer injury: Variations in responses across development. Poster presented at the annual conference of the Canadian Psychological Association, Toronto, ON.

Casola, C.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2017, June). Why do children transgress against others? Mothers' attributions for children's and adolescents' harmful behaviors with friends and siblings. Poster presented at the annual conference of the Canadian Psychological Association, Toronto, ON.

Tavassoli, N.*, & **Recchia, H. E.** (2017, April). *"I do what I wanna do, I don't have to share!" Sharing between siblings in naturalistic interactions in early childhood.* Poster presented at the biennial meeting of the Society for Research in Child Development, Austin, TX.

Scirocco, A.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2017, April). *Children's descriptions of parent-child conversations about perpetrating harm: What do children find helpful and why?* Poster presented at the biennial meeting of the Society for Research in Child Development, Austin, TX.

Recchia, H. E., & Witwit, M.* (2017, April). *"She wants to be the queen of the remote control": Parents' perspectives on siblings' conflict goals in middle childhood.* Poster presented at the biennial meeting of the Society for Research in Child Development, Austin, TX.

Adrien, E.*, **Recchia, H. E.**, & Wainryb, C. (2016, June). *Variable-centered and person-centered analyses of children's narratives of peer injury.* Poster presented at the annual meeting of the Jean Piaget Society, Chicago, IL.

Scirocco, A.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2016, June). *Mothers' and children's perspectives on lessons to be learned from children's experiences of harming others.* Poster presented at the annual meeting of the Jean Piaget Society, Chicago, IL.

Riedel, M.*, **Recchia, H. E.**, Rajput, A.*, & Peccia, S.* (2016, June). *"He didn't see the puddle and splashed me by accident": References to false beliefs, interpretive diversity, and attributions of intent in conflicts with agemates.* Poster presented at the annual meeting of the Jean Piaget Society, Chicago, IL.

Tavassoli, N.*, & **Recchia, H. E.** (2016, June). *The development of prosocial behavior between siblings: Helping, sharing, comforting, and protecting.* Poster presented at the annual meeting of the Jean Piaget Society, Chicago, IL.

Faulconbridge, O.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2016, June). *Age-Related Changes in Intrapersonal and Interpersonal Dimensions of Children's Forgiveness Experiences.* Poster presented at the annual meeting of the Jean Piaget Society, Chicago, IL.

- Wainryb, C., **Recchia, H. E.**, Faulconbridge, O.*, & Pasupathi, M. (2016, March). *“I’m a forgiving person, but that was just too mean”*: Adolescents’ narrative accounts of forgiving and not forgiving. Poster presented at the biennial meeting of the Society for Research on Adolescence, Baltimore, MD.
- Zentner, D.*, **Recchia, H. E.**, Posada, R., & Wainryb, C. (2016, March). *Gender-related patterns in Colombian youths’ responses to provocation*. Poster presented at the biennial meeting of the Society for Research on Adolescence, Baltimore, MD.
- Recchia, H. E.**, Sarmiento, V.*, Wainryb, C., & Posada, R. (2016, March). *They threw stones at us everyday: Colombian youths’ narrative accounts of interpersonal and collective peer conflicts*. Poster presented at the biennial meeting of the Society for Research on Adolescence, Baltimore, MD.
- Billitteri, J.*, Pasupathi, M., Wainryb, C., & **Recchia, H. E.** (2016, January). *Laughing about transgressions: Humor use as a developing capacity for complex attitudes in narrating*. Poster presented at the annual meeting of the Society for Personality and Social Psychology, San Diego, CA.
- Sarmiento, V.*, **Recchia, H. E.**, Posada, R., & Wainryb, C. (2015, September). *Experiencias de perdón en adolescentes: Diferencias entre conflictos con un individuo y un grupo de pares*. Conferencia Regional Latinoamericana de Psicología - Congreso Colombiano de Psicología, Bogota, Colombia.
- Faulconbridge, O.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2015, June). *“To this day I just can’t trust him anymore”*: Connections between experiences of forgiveness and peer relationships in childhood and adolescence. Poster presented at the annual meeting of the Jean Piaget Society, Toronto, ON.
- Recchia, H. E.**, Sarmiento-Dussan, V.*, Wainryb, C., & Pasupathi, M. (2015, June). *“What does it mean to forgive?”*: Children’s and adolescents’ evolving understandings of forgiveness. Poster presented at the annual meeting of the Jean Piaget Society, Toronto, ON.
- Scirocco, A.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2015, June). *Mother-child conversations about hurting siblings and friends: Similarities and differences in maternal approaches to moral socialization*. Poster presented at the annual meeting of the Jean Piaget Society, Toronto, ON.
- Zentner, D.*, Babin-Molina, M.*, **Recchia, H. E.**, Wainryb, C., & Posada, R. (2015, June). *When do Colombian adolescents enact revenge fantasies? Associations with exposure to violence, aggression, and school climate*. Poster presented at the annual meeting of the Jean Piaget Society, Toronto, ON.
- Scirocco, A.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2015, March). *Are maternal moral socialization strategies sensitive to sibling conflict features and relationship quality?* Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.

- Zentner, D.*, **Recchia, H. E.**, Posada, R., & Wainryb, C. (2015, March). *Associations between exposure to violence and youths' responses to harm in accounts of forgiveness and nonforgiveness*. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- Wainryb, C., **Recchia, H. E.**, Pasupathi, M., Babin-Molina, M.*, & Zentner, D.* (2015, March). *I wanted her to feel as bad as she had made me feel: Children's desires for revenge and reasons for enacting or eschewing revenge*. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- Faulconbridge, O.*, **Recchia, H. E.**, Wainryb, C., & Posada, R., Pasupathi, M. (2015, March). *"I forgave him cuz he showed he was sorry": Adolescents' reasons for forgiveness and nonforgiveness in different cultural contexts*. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2015, March). *Associations between relationship quality and children's narrative accounts of transgressions against friends*. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- Komolova, M., Wainryb, C., & **Recchia, H. E.** (2015, March). *"She had a reason to be concerned": Youth making sense of their mothers' and friends' perspectives in their accounts of conflicts*. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- Howe, N., DellaPorta, S.*, **Recchia, H. E.**, & Ross, H. (2015, March). *Older and younger sibling initiation of teaching in early childhood*. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- Cendales, R.*, Posada, R., Martinez, C.*, Acero, J.*, Pizza, L.*, **Recchia, H. E.**, & Wainryb, C. (2015, March). *Exposure to violence and its relation to beliefs about aggression and conflict resolution strategies in Colombian adolescents*. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- Acero, J.*, Posada, R., **Recchia, H. E.**, & Wainryb, C. (2015, March). *Narratives about forgiveness or lack thereof: The role of justice in Colombian adolescents' resolution of conflict*. Poster presented at the biennial meeting of the Society for Research in Child Development, Philadelphia, PA.
- Zentner, D.*, **Recchia, H. E.**, Posada, R., & Wainryb, C. (2014, May). *Colombian adolescents' descriptions of emotions in forgiveness and non-forgiveness experiences with peers: Associations with exposure to violence*. Poster presented at Development 2014, Ottawa, ON.
- Peccia, S.*, Rajput, A.*, & **Recchia, H. E.** (2014, May). *Examining links between children's attributions of intent and descriptions of conflict strategies across sibling and peer relationships*. Poster presented at Development 2014, Ottawa, ON.

- Rajput, A.*, & **Recchia, H. E.** (2014, May). *Children's interpretations of conflict with their peers and siblings: Using ambiguous provocation scenarios to assess attributions of intent*. Poster presented at Development 2014, Ottawa, ON.
- Faulconbridge, O.*, Oldroyd, K.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2014, May). *"It was a good thing that I didn't forgive": Children's and adolescents' judgments of their experiences of forgiveness and nonforgiveness*. Poster presented at Development 2014, Ottawa, ON.
- Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2014, March). *Adolescents' narrative accounts of their experiences of forgiveness and nonforgiveness*. Poster presented at the biennial meeting of the Society for Research on Adolescence, Austin, TX.
- Scirocco, A.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2013, October). *Moral socialization in mother-child conversations about hurting siblings and friends*. Poster presented at the annual meeting of the Association for Moral Education, Montreal, QC.
- Cendales Reyes, R.*, Acero Barrera, J. P.*, Pizza Becerra, L.*, Posada Gilede, R., **Recchia, H. E.**, & Wainryb, C. (2013, June). *Relationships between exposure to violence, school climate, attitudes towards vengeance and competences toward conflict resolutions in Colombian adolescents*. Poster presented at the annual meeting of the Jean Piaget Society, Chicago, IL.
- Bourne, S.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2013, June). *Interpreting others' emotions, needs, and thoughts: The development of moral agency in mother-child conversations about harm and help*. Poster presented at the annual meeting of the Jean Piaget Society, Chicago, IL.
- Monette, C.*, & **Recchia, H. E.** (2013, June). *"This was no accident!" Children's moral judgments of harmful behaviour in different relationships*. Poster presented at the annual meeting of the Jean Piaget Society, Chicago, IL.
- Rajput, A.*, Peccia, S.*, & **Recchia, H. E.** (2013, June). *"He was trying to hurt my feelings": Children's interpretations of ambiguous provocation by siblings, friends, and disliked peers*. Poster presented at the annual meeting of the Jean Piaget Society, Chicago, IL.
- Faulconbridge, O.*, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2013, June). *"I was so mad that I didn't want to forgive him": Children's and adolescents' descriptions of their reasons for forgiveness and nonforgiveness*. Poster presented at the annual meeting of the Jean Piaget Society, Chicago, IL.
- Acero Barrera, J. P.*, Cendales Reyes, R.*, Pizza Becerra, L.*, Posada Gilede, R., **Recchia, H. E.**, & Wainryb, C. (2013, April). *Relación entre la percepción del clima escolar y el desarrollo de actitudes y competencias para la resolución de conflictos*. Poster presented at the Congreso Interamericano de Psicología, Brasilia, Brazil.
- Peccia, S.* & **Recchia, H. E.** (2013, April). *"I would make a new one and ask him to help me": Children's descriptions of their conflict strategies across sibling and peer relationships*.

Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA.

Bourne, S. *, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2013, April). *Constructing moral agency in mother-child conversations about harm and help: Recognizing others' emotions, needs, and thoughts*. Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA.

Bourne, S. *, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2013, April). *The construction of moral agency in children's and adolescents' narrative accounts of harming and helping their friends*. Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA.

Robinson, J. *, **Recchia, H. E.**, & Wainryb, C. (2013, April). *"He was wrong but...": Mother's attributions of their children's harmful and helpful behaviors*. Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA.

Recchia, H. E., Wainryb, C., & Pasupathi, M. (2013, April). *"I called him a nasty little elf-brother": Children's and adolescents' accounts of harming their friends and siblings*. Poster presented at the biennial meeting of the Society for Research in Child Development, Seattle, WA.

Howe, N., Della Porta, S. *, **Recchia, H. E.**, Funamoto, A. *, & Ross, H. (2012, July). *Older siblings' teaching strategies and type of knowledge during naturalistic interactions in early childhood*. Poster presented at the biennial meeting of the International Society for the Study of Behavioral Development, Edmonton, AB.

Peretti, M. *, **Recchia, H. E.**, & Martin-Storey, A. (2012, June). *Possible selves of sexual majority and minority youth: Links to depression*. Poster presented at the annual meeting of the Jean Piaget Society, Toronto, ON.

Recchia, H. E., Wainryb, C., Pasupathi, M., Babin-Molina, M. *, & Leddin, S. * (2012, June). *"I wanted to punch her in the nose and watch her cry": Children's and adolescents' descriptions of desiring and seeking revenge*. Poster presented at the annual meeting of the Jean Piaget Society, Toronto, ON.

Bourne, S. *, **Recchia, H. E.**, & Wainryb, C. (2012, March). *Adolescents' accounts of helping and hurting others: Lessons about the development of moral agency*. Poster presented at the biennial conference of the Society for Research on Adolescence, Vancouver, British Columbia, Canada.

Santo J.B., **Recchia H. E.**, Martin-Storey A., & Bukowski W.M. (2012, March). *Self-Discontinuity Moderates the Association between Peer Victimization and Depressed Affect: A five-month examination of early adolescents*. Poster presented at the biennial conference of the Society for Research on Adolescence, Vancouver, British Columbia, Canada.

Recchia, H. E., Wainryb, C., & Pasupathi, M. (2011, June). *"I didn't mean to hurt her but I was just so mad": Children's and adolescents' narrative accounts of harming their younger*

siblings and friends. Poster presented at the annual conference of the Jean Piaget Society, Berkeley, CA.

Bourne, S. *, **Recchia, H. E.**, Wainryb, C. (2011, June). *Children's narrative accounts of helping and hurting their friends, and what they teach us about moral development*. Poster presented at the annual conference of the Jean Piaget Society, Berkeley, CA.

Recchia, H. E., Wainryb, C., & Howe, N. (2011, March). *Two sides to every story? Parents' attributions of culpability for their children's sibling conflicts*. Poster presented at the biennial conference of the Society for Research in Child Development, Montreal, QC.

O'Donnell, N. *, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2011, March). *Children's and adolescents' narrative accounts of their forgiveness experiences*. Poster presented at the biennial conference of the Society for Research in Child Development, Montreal, QC.

Funamoto, A. *, Della Porta, S. *, Howe, N., & **Recchia, H. E.**, & (2011, March). *Investigating sibling teaching behaviors and social cognitive skills during self-guided and teacher-directed tasks*. Poster presented at the biennial conference of the Society for Research in Child Development, Montreal, QC.

O'Donnell, N. *, **Recchia, H. E.**, Wainryb, C., & Pasupathi, M. (2010, June). *Experiences of forgiveness and ideas for revenge in children and adolescents*. Poster presented at the annual conference of the Jean Piaget Society, St. Louis, MO.

Recchia, H. E., Brehl, B. A., & Wainryb, C. (2010, June). *"She just didn't fit in": Children and adolescents' reasons for socially excluding others*. Poster presented at the annual conference of the Jean Piaget Society, St. Louis, MO.

Funamoto, A. *, Della Porta, S., Howe, N., & **Recchia, H. E.**, & (2010, May). *Sibling teaching during novel and self-guided tasks: The role of age and gender*. Poster presented at Development 2010, Ottawa, ON.

Della Porta, S., **Recchia, H. E.**, Funamoto, A. *, & Howe, N. (2010, May). *The role of social cognitive skills in sibling teaching during novel and self-guided tasks*. Poster presented at Development 2010, Ottawa, ON.

Recchia, H. E., Brehl, B. A., & Wainryb, C. (2010, March). *"I can't be friends with everyone": Adolescents' reasons for socially excluding others*. Poster presented at the biennial conference of the Society for Research in Adolescence, Philadelphia, PA.

Santo, J. B., **Recchia, H. E.**, Martin-Storey, A., & Bukowski, W. M. (2010, March). *Adolescent self-continuity moderates the association between peer victimization and depressed affect*. Poster presented at the biennial conference of the Society for Research in Adolescence, Philadelphia, PA.

Recchia, H. E., & Howe, N. (2009, June). *When do siblings achieve compromise resolutions? Associations with conflict issues, culpability, and emotions*. Poster presented at the annual conference of the Jean Piaget Society, Park City, UT.

- Recchia, H. E., & Howe, N.** (2009, April). *Sibling relationship quality moderates associations between parental interventions and siblings' independent conflict strategies*. Poster to be presented at the biennial conference of the Society for Research in Child Development, Denver, CO.
- Santo, J. B., **Recchia, H. E.**, Martin-Storey, A. K., & Bukowski, W. M. (2009, April). *Essentialist and narrativist strategies of self-continuity: Patterns of association for child and adult samples*. Poster presented at the biennial conference of the Society for Research in Child Development, Denver, CO.
- Roger, K.*, **Recchia, H. E.**, & Howe, N. (2008, August). *Sibling relationship quality and internal state talk in family discussions*. Poster presented at the annual conference of the American Psychological Association, Boston, MA.
- Recchia, H. E.**, Santo, J. B., Martin-Storey, A. K., Bukowski, W. M., & Meyer, F. A. (2008, July). *Anxiety during the first two weeks of secondary school: Associations with strategies of personal continuity*. Poster presented at the biennial conference of the International Society for the Study of Behavioral Development, Wuerzburg, Germany.
- Recchia, H. E., & Howe, N.** (2008, June). *Relationship quality moderates the link between children's subjectivist views of interpersonal disagreements and sibling conflict resolution strategies*. Poster presented at the annual conference of the Institute of Cognitive Sciences, Université de Québec à Montréal, Montréal, QC.
- Martin-Storey, A., Santo, J. B., **Recchia, H. E.**, & Bukowski, W. M. (2008, June). *Multi-rater perspectives of academic achievement relate to perception of self-continuity in early adolescence*. Poster presented at the annual conference of the Jean Piaget Society, Québec City, Canada.
- Recchia, H. E.**, Hawkins, J.*, & Howe, N. (2008, June). *Children's attributions of fault for sibling conflict: Social and cognitive correlates*. Poster presented at the annual conference of the Jean Piaget Society, Québec City, Canada.
- Recchia, H. E., & Howe, N.** (2008, June). *Sibling relationship quality and sibling teaching/learning interactions: A four-year longitudinal study*. Poster presented at the annual conference of the Jean Piaget Society, Québec City, Canada.
- Recchia, H. E., & Howe, N.** (2007, April). *Family talk about internal states and children's relative appraisals of self and sibling*. Poster presented at the biennial conference of the Society for Research in Child Development, Boston, MA.
- Howe, N., Jacobs, E., Vukelich, G., & **Recchia, H. E.** (2007, April). *Quality of child care and educator beliefs about curriculum*. Poster presented at the biennial conference of the Society for Research in Child Development, Boston, MA.

- Vukelich, G., Jacobs, E., Howe, N., & **Recchia, H. E.** (2007, April). *Early childhood educators' level of education in relation to curriculum beliefs*. Poster presented at the biennial conference of the Society for Research in Child Development, Boston, MA.
- Recchia, H. E.**, Howe, N., Ross, H. S., & Alexander, S. A.* (2007, April). *Children's understanding and production of verbal irony in family conversations*. Poster presented at the biennial conference of the Society for Research in Child Development, Boston, MA.
- Recchia, H. E.**, Howe, N., & Alexander, S. A.* (2006, June). *Do the ends justify the means? Variations in sibling teachers' responses to learner errors*. Poster presented at the annual conference of the Jean Piaget Society, Vancouver, BC.
- Recchia, H. E.**, Howe, N., & Alexander, S. A.* (2005, June). *Siblings as teachers: Individual differences in children's teaching styles*. Poster presented at the annual conference of the Jean Piaget Society, Vancouver, BC.
- Recchia, H. E.**, & Howe, N. (2005, June). *Associations between children's talk about internal states and the quality of their sibling relationship*. Poster presented at the annual conference of the Canadian Psychological Association, Montréal, QC.
- Howe, N., & **Recchia, H. E.** (2005, April). *Sibling teaching in early and middle childhood: The role of gender and teacher birth order*. Poster presented at the biennial conference of the Society for Research in Child Development, Atlanta, GA.
- Recchia, H. E.** & Howe, N. (2005, April). *Family talk about internal states and children's self-serving biases in recall of sibling conflicts*. Poster presented at the biennial conference of the Society for Research in Child Development, Atlanta, GA.
- Recchia, H. E.**, & Howe, N. (2005, February). *Allies and enemies: Children's conversations about internal states and the quality of their sibling relationship*. Poster presented at the "Promoting Social Interaction and Preventing Social Isolation" conference of the Centre for Research in Human Development, Concordia University, Montréal, QC.
- Howe, N., & **Recchia, H. E.** (2004, July). *Sibling teaching in early and middle childhood*. Poster presented at the biennial meeting of the International Society for the Study of Behavioural Development, Ghent, Belgium.
- Recchia, H. E.**, Ross, H. S., & Carpendale, J. I. M. (2004, June). *Appreciating antagonists' divergent interpretations of conflict and the development of an interpretive understanding of mind*. Poster presented at the annual meeting of the Jean Piaget Society, Toronto, ON.
- Sahdra, B. K., **Recchia, H. E.**, & Kunda, Z. (2004, January). *Being estranged: When White students interact with Asian students*. Poster presented at the annual meeting of the Society for Personality and Social Psychology, Austin, TX.
- Ross, H. S., Smith, J., Spielmacher, C. E., & **Recchia, H. E.** (2003, April). *Shading the truth: Memory and impression management in children's representations of past conflicts*. Poster

presented at the biennial conference of the Society for Research in Child Development, Tampa, FL.

GRANTS AND RESEARCH CHAIRS

Awarded

2022-2028. Social Sciences and Humanities Research Council of Canada, Partnership Grant. *Past wrongs, future choices*. \$2,500,000.

PI: Jordan Stanger-Ross

Co-investigators: **Holly Recchia** (+49 other researchers)

2022-2027. Social Sciences and Humanities Research Council of Canada, Insight Grant. *Landscape of Hope: Magnifying Narratives of Resilience and Ensuring Wellbeing of Marginalised Québécois Youth*. \$399,900.

PI: Vivek Venkatesh

Co-applicants: **Holly Recchia** (+13 other researchers)

2022-2026. Social Sciences and Humanities Research Council of Canada, Insight Grant. *Mid-Adolescents' Everyday Interactions with Siblings and Best Friends: Associations with Relationship Quality and Well-Being*. \$274,193.

PI: Melanie Dirks

Co-applicants: William Bukowski, Wendy Craig, Jessica Flake, Alexa Martin-Storey, Ryan Persram, **Holly Recchia**.

2022-2026. Fonds québécois de la recherche sur la société et la culture, Soutien aux équipes de recherche (équipe en renouvellement). *Promouvoir la résilience: La compétence émotionnelle en contexte de transition et d'adversité*. \$382,238.

PI : Dale M. Stack

Team Members : Erin Barker, Paul Hastings (International collaborator), Elizabeth Olivier, **Holly E. Recchia**, Lisa A. Serbin, Marie-Helene Veronneau-McArdle.

2022-2025. Social Sciences and Humanities Research Council of Canada, Insight Grant. *Children's and Adolescents' Perspectives on Accountability for Harm and Restorative Justice in Schools*. \$99,301.

PI: **Holly Recchia**

Collaborators: Hariclia Petrakos, Gabriel Velez, Cecilia Wainryb.

2022-2025. Spencer Foundation, Small Research Grants. *Minoritized Adolescents' Perspectives on Harm, Justice, and Discipline in their Schools*. \$45,509.

PI: Gabriel Velez

Collaborators: **Holly Recchia**, Cecilia Wainryb.

2020-2022. Concordia University (VPRGS), Individual Seed Grant. *Colombian Youths' Experiences and Evaluations of Disciplinary Practices at School: Associations with Social and Institutional Trust*. \$6,982.

PI : Holly E. Recchia

2019. Aid to Research-Related Events, Office of the VP Research and Graduate Studies, Concordia University. *Understanding and Promoting Positive Sibling Relationships in Childhood and Adolescence*. \$2498

PI: Holly E. Recchia

Collaborators: Nina Howe, Melanie Dirks

2018. Aid to Research-Related Events, Office of the VP Research and Graduate Studies, Concordia University. *Challenging Childhood: An Interdisciplinary Workshop*. \$1536.

PI: Holly E. Recchia

Co-director: Natalie Fletcher

2017 – 2021. Fonds québécois de la recherche sur la société et la culture, Soutien aux équipes de recherche (équipe en renouvellement). *Compétence émotionnelle et transition réussie à l'âge adulte : une approche développementale*. \$280,448.

PI : Dale M. Stack

Team Members : Erin Barker, Paul Hastings (International collaborator), **Holly E. Recchia**, Lisa A. Serbin, Marie-Helene Veronneau-McArdle.

2017 – 2019. Social Sciences and Humanities Research Council of Canada, Insight Development Grant. *Le rôle de la compétence émotionnelle pour favoriser la réussite scolaire des élèves en formation professionnelle*. \$59,940.

PI: Marie-Helene Veronneau-McArdle

Co-investigators : Erin Barker, **Holly E. Recchia**, Lisa Serbin, Dale M. Stack.

Collaborator : Henri Boudreault

2016 - 2019. Curriculum Innovation Fund, Office of the Provost and VP of Academic Affairs, Concordia University. *Interdisciplinary problem-based blended learning in the Department of Education*. \$22,989

PI: Ann-Louise Davidson

Co-investigators: Bob Bernard, Giuliana Cucinelli, Carolina Cambre, Kim McDonough, Ayaz Naseem, Helena Osana, **Holly E. Recchia**, Richard Schmid.

2016 - 2020. Social Sciences and Humanities Research Council of Canada, Insight Grant. *Understanding children's and adolescents' emotional experiences of peer injury and their implications for parental responses*. \$168,766.

PI: Holly E. Recchia

Co-investigator: Melanie Dirks

Collaborator: Cecilia Wainryb

2015 – 2020. Concordia University Research Chair (New Scholar) in Moral Development and Education. \$145,000 (20,000 in research support + \$9,000 stipend per annum for five years).

2015 – 2017. Social Sciences and Humanities Research Council of Canada, Insight Development Grant. *Investigating the development of toddler peer relationships from a social relations model*

perspective. \$74,740.

PI: Nina Howe

Co-investigators: William Bukowski, Michal Perlman, **Holly E. Recchia**, & Hildy Ross.

2015 - 2017. Concordia University (VPRGS), Individual Seed Grant. *Children's and adolescents' emotional responses to injury : Links to constructions of meaning in accounts of peer victimization*. \$6,931.

PI : **Holly E. Recchia**

Collaborator : Cecilia Wainryb.

2015 – 2020. Social Sciences and Humanities Research Council of Canada, Insight Grant. *Breaking the cycle: An inter-generational approach to educational success and opportunity for disadvantaged youth*. \$328,246.

PI : Lisa Serbin

Co-investigators: Dale Stack, Marie-Helene Veronneau, **Holly E. Recchia**.

2012 – 2015. Social Sciences and Humanities Research Council of Canada, Insight Development Grant. *Growing up in a violent society: Links between exposure to violence and youths' understandings of revenge and forgiveness*. \$74,390 (period of grant includes extension for parental leave).

PI : **Holly E. Recchia**

Co-investigator: Roberto Posada

Collaborator: Cecilia Wainryb

2012 – 2015. Fonds québécois de la recherche sur la société et la culture, Soutien aux équipes de recherche. *Le développement de la compétence émotionnelle, phase III: de la petite et moyenne enfance à l'adolescence*. \$415,182.

PI : Dale M. Stack

Team Members : Lisa A. Serbin, Paul Hastings (International collaborator), **Holly E. Recchia**, Marie-Helene Veronneau-McArdle, Alex E. Schwartzman.

2011 – 2015. Concordia University, Regroupements stratégiques. *Centre de recherche en développement humain*. \$350,000. (awarded)

PI : William Bukowski.

Co-investigators : **Holly Recchia** (+ 41 other researchers)

2011 - 2015. Fonds québécois de la recherche sur la société et la culture, Établissement de nouveaux professeurs-chercheurs. *Comprendre l'agression entre frères et soeurs : les mécanismes du traitement de l'information sociale chez les enfants réagissant à une provocation ambiguë de leurs pairs et de leurs frères et sœurs*. \$39,409. (period of grant includes extension for parental leave)

PI : **Holly E. Recchia**

Project profiled in « Recherches Innovations; la recherche agenda » (8^e édition ; 2012).

2011 - 2014. Concordia University Faculty of Arts & Science, Start-up and Capital Equipment Grant. \$27,000.

PI: Holly E. Recchia

2011 – 2013. Concordia University, Regroupements stratégiques. *Centre de recherche en développement humain*. \$166,000.

PI : William Bukowski.

Co-investigators : **Holly Recchia** (+ 41 other researchers)

2011 – 2013. Fonds québécois de la recherche sur la société et la culture, Regroupements stratégiques. *Centre de recherche en développement humain*. \$110,584.

PI : William Bukowski.

Co-investigators : **Holly Recchia** (+ 41 other researchers)

TEACHING AND SUPERVISION

Courses Taught

Special Topics in Child Studies (CHST 640; Moral Development and Education)

-Spring, 2020

Teaching Ethics and Religious Culture (EDUC 355).

-Fall, 2022; Fall, 2021; Fall, 2020; Fall, 2019; Winter, 2018; Spring, 2017; Winter, 2015; Winter, 2013

Intermediate Quantitative Methods (EDUC 802/806).

-Fall, 2021; Winter, 2020; Fall, 2017; Winter, 2015

Quantitative Research Methods (CHST 607).

-Fall, 2014; Fall, 2012

Child Development I (EDUC211).

- Fall, 2017; Fall, 2014; Fall, 2011

Child Development II (EDUC311).

-Winter, 2013; Winter, 2012; Fall, 2011; Winter, 2011

Social Processes (CHST665/614).

-Fall, 2022; Spring, 2015; Winter, 2012

Development During Childhood (PSYC375).

-Winter, 2009

Directed Readings (CHST 680).

-Spring 2023 (Children's Disclosure to Parents – T. Konov)

-Winter, 2020 (Restorative Justice in Schools – L. Pareja-Conto)

-Spring, 2019 (Intersections between Children's Social-Cognitive and Moral Development in Relational Context – T. Pirro, M. Reid, A. Saint-Martin)

-Spring, 2018 (Parental emotional socialization – M. Badasu).

-Winter, 2017 (Colombian Youths' Reasoning about Transitional Justice – A. Restrepo).

-Winter, 2017 (Teachers' Conceptions of Respect in the Classroom – A. Singer).

- Winter, 2016 (Parents' Attributions for their Children's Transgressions – C. Casola).
- Spring, 2015 (The Development of Prosociality – N. Tavassoli).
- Spring, 2015 (Forgiveness in Different Relationship Contexts – O. Faulconbridge).
- Winter, 2015 (Gender Issues in Honor Cultures – D. Zentner).
- Winter, 2013 (Moral Socialization in Parent-Child Relationships – A. Scirocco).
- Spring, 2012 (Children's Sociomoral Development in the Context of Close Relationships – A. Rajput).

PhD Tutorial (EDUC 825-827; INDI 820).

- Fall, 2021 (Developing a Methodology for Assessing Families' Perspectives on Daily Sibling Interactions – C. Kinsley)
- Winter, 2020 (Children's Understanding of Moral Dimensions of Climate Change and Sustainability – J. Ginsburg).
- Spring, 2018 (Theories of Prosocial Development – N. Tavassoli)
- Spring, 2017 (Reading Fiction: Links to Social, Moral, and Emotional Outcomes in Childhood – S. Kozak)
- Fall, 2016 (Coping with Emotions in the Aftermath of Peer Injury: A narrative approach – M. Bodington).
- Fall, 2015 (Person-centered approaches: Theoretical bases and statistical analyses – E. Adrien).
- Winter, 2015 (Morality and Ethics: Contexts for Development – A. Scirocco)
- Fall, 2014 (Resilience and Meaning-Making in War-Affected Youth – M. Savard).
- Fall, 2014 (The Development of Children's Friendships – J. Leach).
- Spring, 2011 (Methods of Family Interaction Research – S. Della Porta).

Guest Lecturing

- 2022, 2023. Moral Agency as a Facet of Emotional Competence (in MA Seminar, Department of Psychology), UQAM.
2022. The Perpetration of Harm: Revenge, Forgiveness, and Reconciliation (in Child Development, Social Conflict and Violence, upper-level undergraduate seminar, Department of Psychology), Rutgers.
2013. Introduction to Child Studies (In PhD Seminar, Department of Education), Concordia University.
- 2011, 2012, 2014. Research on Sociomoral Development in the Family (In Seminar in Child Study, MA-level Child Study course), Concordia University.
- 2011, 2012. Family Conversations as Contexts for Social-Cognitive Development (In Neurosciences du Langage, Undergraduate Linguistics course), Université de Montréal.
2010. Parental Interventions into Sibling Conflict (In Parenting, Undergraduate Family and Consumer Studies course), University of Utah.
- 2006 – 2009. Culture and the Family (In Child Development II, Undergraduate Education course), Concordia University.

2006. Family Systems and Ecological Theory (In Child Development II, Undergraduate Education course), Concordia University.

Teaching Assistantships

2006, 2007. Lab instructor. Selected Problems in Design and Analysis for Applied Research (Doctoral level course).

2005, 2006. Lab instructor. Statistical Analysis and Experimental Design (Master's level course).

2004 – 2005. Lab instructor and project supervisor. Research Experience in Psychology (Undergraduate level course).

Pedagogical Training and Professional Development

2022. *Accessible and Inclusive Teaching Practices*. Equity Office, Concordia University.

2021. *Practical Strategies on Decolonizing Eurocentric 'Normative Discourse' in Curriculum and Pedagogical Practices*. Centre for Teaching and Learning, Concordia University.

2018. *Summer seminar of the Institute for the Advancement of Philosophy for Children*. Mendham, NJ.

2018. *Journées provinciales de la formation continue en éthique et culture religieuse*. Association québécoise en éthique et culture religieuse. Montebello, QC.

2015. *How to integrate real-world learning into courses*. The Teaching Exchange, Centre for Teaching and Learning Services, Concordia University.

2014, 2015. *Sommet des formateurs universitaires sur la diversité ethnoculturelle, religieuse et linguistique en éducation*, Centre d'études ethniques des universités montréalaises, Université du Québec à Montréal.

2014. *Religious Diversity in the Classroom*, Webinar Series, Tanenbaum Center for Interreligious Understanding (Participated in three sessions).

2009. Wiley Faculty Network Seminar: *Using Psychology to Teach Psychology: Teaching Tips for Effective Learning*.

2008. Wiley Faculty Network Seminar: *Scenarios and Strategies: Addressing Individual Student Concerns*.

2006. *Developmental Science Teaching Institute*, Biennial meetings of the Society for Research in Child Development, Boston, MA.

2005. *PhD Seminar in University Teaching* (30-hour course), Centre for Teaching and Learning Services, Concordia University.

Undergraduate Thesis and Specialization Project Supervision

2023-2024. Emilie Chodat (Psychology). Topic TBD.

2022–2023. Amanda Bonin (Psychology). *Students' reports of responses to peer harm in relation to school climate.*

2022–2023. Laura Amodeo (Psychology). *Siblings' days deconstructed: Links between relationship quality and family member's perspectives on daily interactions.*

2022–2023. Vilma Escorcia (Psychology). *Adolescents' varying perspectives on the same harm event.*

2021-2022. Gabrielle Leclerc (Psychology). *Parents' views on self- and other-oriented lessons to be learned from children's prosocial experiences.*

2020-2021. Jade Paré (Psychology). *Links between mindset and attributions in inconsistent and consistent moral value narratives.*

2019-2020. Seleste Beaulieu (Psychology; co-supervised by Kristen Dunfield). *Intention-Mediated Selective Helping in Infancy After a Delay.*

2019-2020. Laura Pareja (Psychology; co-supervised by Kristen Dunfield). *Adolescents' reasoning about intergroup conflict with peers in Colombian schools: Associations with institutional and social trust.*

2019-2020. Ariana Borjian (Psychology; co-supervised by D. Stack). *Children's causal attributions for their peers' transgressions towards them.*

2018-2019. Sandra Silva (Psychology; co-supervised by William Bukowski). *Colombian youths' evaluations of justice: Associations with support for the peace agreement.*

2018-2019. Julie Guindon (Psychology; co-supervised by Erin Barker). *Maternal socialization of coping and helping children and adolescents manage peer injury.*

2018-2019. Caroline Pawelczyk (Psychology; co-supervised by Kristen Dunfield). *Young adults' reasons for being glad or not glad after helping others.*

2017-2018. Julia Renauld (Psychology; co-supervised by Kristen Dunfield). *Parental interventions eliciting prosociality between siblings.*

2017-2018. Claudia Royea (Psychology; co-supervised by Dale Stack). *Mothers' Conveyed Mindset in Conversations with their Children Across Development.*

2011 - 2012. Jessica Robinson (Psychology, University of Utah; co-supervised by Cecilia Wainryb). *"It's okay to be mad, even when you're wrong": Mothers' explanations for their children's harmful and helpful behavior.*
-Selected for presentation at Research Posters on the Hill (research presentation to Utah state legislature) and the National Conference for Undergraduate Research.

2007 – 2008. Jessica Hawkins (Psychology; co-supervised by Nina Howe). *Children's attributions of fault for sibling conflicts: Associations with age, birth order, and sibling relationship quality.*
-Selected for presentation at Concordia Arts & Sciences Student Research Day.

2004 – 2005. Meaghan Quinlan-Davidson (Psychology; co-supervised by Nina Howe). *Sibling teaching styles and conflict in play.*

Master's Thesis Supervision

2022 – present. Tiffany Konov (MA Child Studies – Thesis Option). Topic TBD.

2022 – present. Ricardo Salas (MA Child Studies – Thesis Option). Topic TBD.

2021 – present. Jaclyn Ohayon (MA Child Studies – Thesis Option). Jaclyn Ohayon (MA Child Studies – Thesis Option). *Morality and meaning-making: How mothers make sense of their own transgressions and those of their adolescent children.*
-proposal Feb 2023

2020 – 2023. Ali Kerem Araboglu (MA Child Studies – Thesis Option). *Daily associations between parental reports of stress and sibling interactions in middle childhood.*
-proposal Jan 2023, defense August 2023

2020 – 2023. Laura Pareja Conto (MA Child Studies – Thesis Option). *Adolescents' reasoning about unambiguous peer harm: Variations across relationship contexts and types of harm*

- SSHRC Fellowship, Michael Smith International Travel Supplement
- SRCD travel award
- Stand Out Research Award
- Releve Etoile FRQ award
- April 2023 proposal, defense July 2023

2019 – 2022. Nazila Tolooei (MA Child Studies – Thesis Option). *Elementary School-Aged Children's Conversations with their Mothers about Helping and Being Helped by Peers.*
-proposal May 2021, defense Winter 2022

2019 – 2021. Christine Kinsley (MA Child Studies – Thesis Option). *Taking the Temperature: Associations between Sibling Relationship Warmth and Reports of Daily Interactions in Preadolescence*
-proposal January 2021, defended Spring 2021
-comprehensive exams summer 2023

2018 – 2021. Anna Saint-Martin (MA Child Studies – Thesis Option). *How do Mothers Encourage Their Children to Take Responsibility for Protecting Themselves in Conversations about Being Harmed by a Peer? Exploring Links to Psychosocial Outcomes*
-proposal June 2020; defended April 2021

2018 – 2021. Miranda Reid (MA Child Studies – Thesis Option). *Navigating Diverse Perspectives: The Longitudinal Development of Children's Intellectual Humility in Philosophical Dialogues.*
-proposal July 2020; defended before DNE in January 2022

2018 – 2021. Teresa Pirro (MA Child Studies – Thesis Option). *Is and Ought: Mother-Child Disagreements about Facts and Values when Discussing Peer Conflicts.*
-proposal May 2020, defense February 2021

2017 – 2019. Mawuena Badasu (MA Child Studies – Thesis Option). *"It was a bit my fault and a bit his fault": Mothers' and Early School-Aged Children's Blame Attributions in Conversations about Peer Conflicts.*
-defended June 2019

2016 – 2019. Angelica Restrepo (MA Child Studies – Thesis Option). *Colombian Youths' Reasoning about Retributive and Restorative Justice: Associations with Belief Systems of Trust*
-SSHRC Fellowship
-Michael Smith International Travel Supplement
-August 2019 defense

2016 – 2019. Alexandra Singer (MA Child Studies – Thesis Option). *Pre-Service Teachers' Perceptions of their Role as Moral Educators: An Exploratory Study.*
-August 2019 defense

2015 – 2018. Cristina Casola (MA Child Studies – Thesis Option). *Mothers' Attributions for their Children's Transgressions Against Siblings and Friends.*

2015 – 2017. Daysi Zentner (MA Child Studies – Thesis Option). *Gender Differences in Colombian Youths' Responses to Provocation.*

2015 – 2017. Nasim Tavassoli (MA Child Studies – Thesis Option). *The Development of Prosocial Behavior Between Siblings: Helping, Sharing, Comforting, and Protecting.*
-International Tuition Fee Remission Award, 2015-2017.
-John Crawford Award, 2015.

2015 – 2017. Olivia Faulconbridge (MA Child Studies – Thesis Option). *Children's and Adolescents' Peer Relationships as Contexts for Forgiveness and Nonforgiveness.*

2014 – 2016. Ma-ab Witwit (MA Child Studies – Thesis Option). *Parents' Understandings of their Children's Sibling Conflict Goals in Early and Middle Childhood.*

2012 – 2014. Alyssa Scirocco (MA Child Studies – Thesis Option). *Moral Socialization in Mother-Child Conversations about Hurting Siblings and Friends*.
-2nd Prize for Best Student Oral Presentation (\$150 award) at Development 2014, Ottawa, ON.

2012 – 2014. Amandeep Rajput (MA Child Studies – Thesis Option). *Children's Interpretations of Ambiguous Provocation from Siblings: Associations with Relationship Quality and Conflict Strategies*.

Doctoral Thesis Supervision

2021 – present. Christine Kinsley (PhD in Education). Topic TBD.

2017 – 2022. Nasim Tavassoli (PhD in Education). *To be or not to be prosocial: Judgments and experiences of prosocial action and refusal across development*
-FRQ-SC Doctoral Fellowship
-Comprehensive exams April 2019; Dissertation Proposal Mar 2020, Dissertation Defense May 2022

2015 – present. Malene Bodington (PhD in Education – co-supervised by Harriet Petrakos). *Teachers' Perspectives on Bullying and Resilience*.
-Proposal 2022
-Comprehensive exams summer/fall 2018

2014 – 2021. Alyssa Scirocco (PhD in Education). *Mindset and Morality: Adolescents' Implicit Theories of Morality*
-Concordia Merit Scholarship.
-SSHRC Doctoral Fellowship.
-Dissertation Defense December 2021

Graduate Committees

2023 – present. Ana Milena Franco Rueda (PhD in Psychology at Universidad Nacional de Colombia; supervisory committee member).

2023. Anna-Elisabeth Baumann (PhD in Psychology, internal examiner).

2023 – present. Clarissa Belleville (MA in Child Studies).

2022 – 2023. Seleste Beaulieu (MA in Psychology; supervisory committee member).

2022 – present. Jean Klasovsky (PhD in Educational Psychology at University of Illinois Chicago ; supervisory committee member)

2021 – 2023. Ashley Montgomery (PhD in Education).

2022. Marisa Mercuri (PhD in Psychology; internal examiner).

2020 – present. Maxine Ianuccilli. (PhD in Psychology; supervisory committee member).

2021. Farzaneh Zamanian (MA Child Studies).

2021 – present. Anita Jandaly (PhD in Education; supervisory Committee member)

2021 – 2022. Victoria Gilmore (MA Child Studies).

2020 – present. John Cyfko (PhD in Psychology at McGill University; supervisory committee member)

2020. Joanna Rosciszewska (PhD in Psychology; internal examiner).

2020. Jesse Renaud (PhD in Psychology; internal examiner).

2020 – 2021. Julia Fuoco (MA Child Studies; successfully defended).

2020 – 2021. Anita Jandaly (MA Child Studies).

2020. Aya Abolenien (PhD in Marketing; internal examiner).

2019 – present. Julia Ginsburg (PhD INDI; supervisory committee member).

2018 – 2019. Neesha Cooper (MA Child Studies; successfully defended).

2018 – 2019. Meredyth Dwyer (MA Child Studies; successfully defended).

2018 – 2019. Fadwa Farhat (MA Child Studies; successfully defended).

2018 – 2019. Ashley Sodano (MA Child Studies; successfully defended).

2018. Paraskevi Engarhos (PhD in Educational and Counselling Psychology, McGill University; external member).

2018. Brittany Tremblay (MA Child Studies; successfully defended).

2018. Katie Foster (MA Child Studies; successfully defended).

2017 – 2019. Talar Kalaidjian (MA Child Studies; successfully defended).

2017. Aryann Blondin (MA Child Studies; successfully defended).

2016 - 2018. Elizabeth Triassi (MA Educational Technology; changed committee members due to evolution of topic).

2015. Kelsey Moore (PhD in School and Applied Psychology, McGill University, external reader).

2015. Sabrina Chiarella (PhD in Psychology, internal examiner).
- 2015 – 2017. Stacey Waks (MA Child Studies; successfully defended).
- 2015 – 2017. Hadia Alsaieq (MA, INDI program; successfully defended).
2015. Natasha Egeli (PhD in Counselling Psychology, University of Alberta; external reader).
- 2015 – 2021. Stephanie Kozak (PhD in Education).
- 2014 – 2015. Stephanie Kozak (MA Child Studies; successfully defended).
- 2014 – 2017. Gala Wilkie (MA Child Studies; successfully defended).
- 2013 – 2019. Michelle Savard (PhD in Education; successfully defended).
- 2013 – 2014. Sabrina Tansey (MA Child Studies; successfully defended).
- 2013 – 2015. Jamie Leach (PhD in Education; changed committee members due to evolution of topic).
- 2012 – 2020. Emmanuel Adrien (PhD in Education; successfully defended).
- 2012 – 2013. Ryan Persram (MA Child Studies; successfully defended).
2012. Stephanie Peccia (MA Child Studies; successfully defended).
- 2012 – 2014. Lindsay Barrieau (PhD in Psychology; successfully defended).
- 2011 – 2016. Cassandra Monette (MA Child Studies; successfully defended).
- 2011 - 2013. Sandra Della Porta (PhD in Education; successfully defended).
- 2011 – 2012. Jamie Leach (MA Child Studies; successfully defended).
- 2011 – 2012. Allyson Cooperman (MA Child Studies; successfully defended).
- 2011 – 2012. Tomoko Matsuda (PhD SIP Program).
2011. Brittany Scott (MA Child Studies; successfully defended).
2011. Shireen Abuhatum (MA Child Studies; successfully defended).
2011. Caroline Ostiguy (PhD Psychology – internal-external; successfully defended).

Undergraduate Student Mentoring

- 2022-2023. Emilie Chodat (Psychology).

2022-2023. Ecem Unsal (Child Studies and Psychology).

2022. Alison Roig (Psychology).

2022. Ramiya Edward (Psychology).

2022. Zoe Adler (Psychology).
-CUSRA summer research award, FRQ cycle 1 award

2022-2023. Jasmine Manan (Psychology).

2022. Amanda Bonin (Psychology).

2022. Joanna Ngan (Psychology).

2021-2022. Vilma Escorcia (Psychology).

2021. Kristen Ferlisi (Psychology).
-CUSRA summer research award

2021. Aliyah Mahon (Psychology).

2020. Daniel Jimenez (Psychology).

2019. Stasia Paraskevacos (Psychology and Linguistics).

2019 – 2020. Alessia Frattolillo. (Psychology)

2019 – 2021. Kayla Guindon (Psychology).

2019 – 2020. Ximena Melara (Psychology).

2019. Sinddy Carreno (Psychology).

2018 – 2019. Chiara Lier (Psychology).

2018 – 2019. Julia Speirs (Child Studies).

2018 – 2021. Amanda Marlandis (Psychology).

2018 – 2019. Chaya Friedlander (Psychology).

2018 – 2019. Claudia Toriz (Psychology).

2018 – 2019. Daniela Ioachim (Psychology).

2018 – 2019. Elysia Conte (Psychology).

- 2018 – 2019. Ergie Sebido (Psychology).
2018. Erica Chelini (Psychology).
2018. Gabriela Eugenia Rey (Psychology).
- 2018 – 2019. Jade Elysia Pare (Psychology).
- 2018 – 2020. Laura Pareja Conto (Psychology).
-MITACS Summer Research Award (2020)
- 2018 – 2019. Rodrigo Ahumada Alarcon (UQAM Psychology).
- 2018 – 2019. Shayla Chilliak (Psychology).
- 2018 – 2020. Sandra Silva (Psychology).
- 2018 – 2019. Billie Mendel (Psychology).
- 2018 – 2020. Erika Infantino (Psychology).
- 2018 – 2020. Shannon Maingot (Psychology).
-CUSRA summer research award
2018. Claudia MacLean.
- 2018 – 2020. Julie Guindon (Psychology).
- 2018 – 2020. Ariana Borjian (Psychology).
2018. Alice Pantelios (Psychology).
2018. Jennifer Sirignano (Psychology).
2018. Shirline Vecchiarelli (Psychology).
- 2017 – 2019. Melissa Commisso (Psychology).
- 2017 – 2019. Caroline Pawelczyk (Psychology).
2017. Farshad Jarrahi (Psychology; Work Study Student).
- 2016 – 2018. Claudia Royea (Psychology).
- 2015 – 2019. Julia Renauld (Psychology).
-CUSRA summer research award

- 2015 – 2016. Kimberlee Koch (ECEE).
- 2015 – 2017. Nadia Long (Psychology).
- 2015 – 2017. Jesse Dumas (Psychology).
- 2015 – 2018. Fatima Inigo (Psychology).
2015. Melissa Lazo (Psychology).
- 2014 – 2016. Luis Consuegra (Psychology).
- 2014 – 2015. Monica Crosetta (Psychology).
- 2014 – 2017. Monique Riedel (Psychology).
- 2014 - 2015. Vanesa Sarmiento Dussan (Research Intern; Psychology alumnus, Universidad de la Sabana)
- 2012-2014. Brian Florez (Psychology).
- 2012-2014. Daysi Zentner (Psychology).
- 2012-2014. Chanel West (Psychology).
- 2012 - 2013. Heather Franz (Child Study; Work Study Student).
- 2011-2014. Olivia Faulconbridge (Psychology).
-Poster presentations at the CRDH annual conference (2013) and the annual Undergraduate Research Day (2013), Concordia University.
-Travel award for poster presentation at Development 2014 (Ottawa, ON).
- 2011-2014. Melina Babin-Molina (Psychology).
-Poster presentations at the annual Undergraduate Research Day (2012) and the CRDH Student Research Day (2012), Concordia University.
- 2011 - 2014. Julia Adams-Whittaker (Psychology).
- 2011 - 2013. Matteo Peretti (Psychology; Work Study Student).
-Poster presentation at the annual Undergraduate Research Day (2012), Concordia University.
- 2011 - 2013. Amanda Mangione (Psychology).
- 2012 - 2013. Najme Farahani (Sauve Scholar).
2012. Stephanie Wells (Sociology, Minor in Education).

2012. Darya Bykadorova (Psychology Alumnus).

2011 - 2012. Gifty Asare (Psychology).

-Poster presentation at the annual Undergraduate Research Day (2012), Concordia University.

2012. Natasha Chenier (English; Work Study Student).

2011 - 2012. Sarah Leddin (Psychology).

-Poster presentation at the annual Undergraduate Research Day (2012), Concordia University.

2011. Nina Geringhoff (Research Intern; Psychology; University of Braunschweig).

PROFESSIONAL MEMBERSHIPS AND SECONDARY RESEARCH AFFILIATIONS

2022 – present. Full member, Centre for the Study of Learning and Performance, Concordia University.

2019 – present. Collaborator, Institut Philosophie Citoyenneté Jeunesse, Université de Montréal.

2015, 2019. Regular Member, Association québécoise en éthique et culture religieuse.

2015 – present. Affiliated Researcher, Promoting Relationships and Eliminating Violence Network (PREVnet).

2014 – present. *Réseau québécois des formateurs universitaires de L'Observatoire sur la Formation à la diversité et L'Équité*, UQAM.

2014 - present. Affiliate, Centre for Oral History and Digital Storytelling, Concordia University.

2012 – present. Member, Equipe de recherche sur la compétence émotionnelle, Concordia University.

2011 – present. Member, Centre for Research in Human Development, Concordia University.

SERVICE

Guest Editorships and Editorial Boards

2022 – present. Consulting Editor, *Child Development*.

2018 – present. Consulting Editor, *Journal of Research on Adolescence*.

Howe, N. & **Recchia, H. E.** (Guest Eds.) (2014). Special issue: Sibling relationships as contexts for learning and development. *Early Education and Development*, 25.

Journal Reviewing

2022. Cognition and Emotion (x 1), Child Development (x 1), Journal of Research on Adolescence (x 1).
2021. Cognition and Emotion (x 1), Child Development (x 3), Children and Society (x 1), Peace and Conflict (x 1), Cognitive Development (x 1), Journal of Child and Family Studies (x 2), Social Development (x 2), Journal of Research on Adolescence (x 5).
2020. Cognitive Development (x 1), British Journal of Developmental Psychology (x 1), Journal of Applied Developmental Psychology (x 1), Child Development (x 3), Early Education and Development (x 1), Social Development (x 1), Developmental Psychology (x 1), Journal of Research on Adolescence (x 2).
2019. Developmental Psychology (x 2), Child Development (x 2), Early Education and Development (x 1), British Journal of Developmental Psychology (x 1), Human Development (x 1), Journal of Research on Adolescence (x 6), Journal of Experimental Child Psychology (x 1).
2018. Aggressive Behavior (x 1), Social Development (x 1), Cognitive Development (x 3), Merrill-Palmer Quarterly (x 1), Child Development (x 2), Cultural Diversity and Ethnic Minority Psychology (x 1), Journal of Research on Adolescence (x 2), Developmental Psychology (x 1), Journal of Educational Psychology (x 1), Current Directions in Psychological Science (x 1).
2017. Cognitive Development (x 1), Journal of Child and Family Studies (x 2), Early Education and Development (x 1), Journal of Moral Education (x 2), Developmental Psychology (x 1), Merrill-Palmer Quarterly (x 1).
2016. Cognitive Development (x 1), Frontiers in Psychology (x 2), Developmental Psychology (x1), Early Education and Development (x 1).
2015. British Journal of Developmental Psychology (x 1), Child Development (x 4), Social Development (x 2), Cognitive Development (x 1), Discourse Processes (x 2), Infant and Child Development (x 1), Developmental Psychology (x 2), Journal of Family Psychology (x 1), Merrill-Palmer Quarterly (x 1).
2014. Child Development (x 1), International Journal of Behavioral Development (x 2), British Journal of Developmental Psychology (x 1), International Journal of Developmental Science (x 2), Journal of the American Psychiatric Nurses Association (x 2), Early Education and Development (x 2), Cognitive Development (x 2), Discourse Processes (x 1).
2013. Psychological Science (x 1).
2012. Child Development (x 2), Journal of Family Psychology (x 1), Social Development (x 1), Journal of Child and Family Studies (x 1), Journal of Latino-Latin American Studies (x 1), Journal of Experimental Child Psychology (x 1), Journal of Cognition and Development (x 1).

2011. Journal of Family Issues (x 1), Educational Psychology (x 1), Infant and Child Development (x 1).

2010. Cognitive Development (x 1), Human Development (x 1), Journal of Personality (x 1), Journal of Family Psychology (x 1).

2009. Social Development (x 2).

2008. European Review of Applied Psychology (x 1).

2007. Social Development (x 1).

2006. International Journal of Behavioral Development (x 1).

University and Community Service

2023. Program reviewer. *Annual Conference of the Association for Moral Education.*

2023. Adjudication of finalists for Pedagogical Innovation Awards competition, Centre for Studies in Learning and Performance.

2023. Panelist. *Getting Educational Research Published 101.* Department of Education Doctoral Course, Concordia University.

2022. Une perspective relationnelle sur la compétence émotionnelle appliquée aux milieux scolaires. OPQ accredited workshop (with M-H Véronneau) delivered at *L'Association Québécoise des Psychologues Scolaires.*

2022. Program reviewer. *Society for Research in Child Development.*

2022-2025. Executive board member. *Association for Moral Education.*

2021-present. Steering committee member, *Centre for Research in Human Development.*

2021. Program reviewer. *Conference of the Society for Research on Adolescence.*

2020. Poster judge. *Association for Moral Education.*

2020. Program reviewer. *Jean Piaget Society.*

2020. Organizer, *Understanding and Promoting Positive Sibling Relationships in Childhood and Adolescence* conference.

2020; 2021. Doctoral Awards Selection Committee. *Social Sciences and Humanities Research Council of Canada.*

- 2017-2020. Board of directors. *Jean Piaget Society for the Study of Knowledge and Development*. (VP of Financial Planning/Fundraising committee, member of Awards Subcommittee).
2019. *Supporting the development of trust among youth*. A series of workshops for parents, teachers, and adolescents. Various schools in Bogotá, Colombia.
2019. Program reviewer. *Society for Research in Child Development*.
2019. Co-organizer, Social Domain Theory preconference of the Society for Research in Child Development (with A. Dahl and K-L Mulvey).
- 2018, 2020. Jury member. *Concours de projets pédagogiques en matière d'éducation interculturelle et inclusive*.
2018. Co-organizer (with D. Stack, E. Barker, M-H Veronneau, L. Serbin). *Emotional Competence Research Symposium*. Full-day symposium featuring trainees.
2018. Co-organizer (with N. Fletcher). *Challenging Childhood: An Interdisciplinary Workshop*. Full-day workshop with academics and community partners, followed by workshop with Brila Youth Board.
2018. Workshop facilitator (with W. Bukowski and M. Savard). *Driving in foreign lands: What we have learned about collecting data in different cultural contexts*. Winter School on Advanced Statistics and Methods, Centre for Research in Human Development, Concordia University.
2015. Co-organizer and discussant. *Relationship Axis Symposium on Prosociality and Empathy*. Centre for Research in Human Development, Concordia University.
2015. Youths' accounts of conflict and their implications for moral agency. Panelist in *Care to comment? Oral history and marginalized communities*. Subversions: English symposium, Vanier College.
2015. Organizer. *Helping Students Manage Peer Disagreements: Educator Workshop*. Full-day workshop with secondary-school teachers from disadvantaged schools in Bogotá, Colombia.
- 2015 – 2017. *Comité de l'étude interregionale sur les compétences acquises et les profils de sortie des étudiants*, Réseau québécois des formateurs universitaires sur la diversité culturelle, religieuse et linguistique en éducation.
- 2014 – present. Advisory Board, Brila (Canadian non-profit organization involved in youth educational projects).
- 2014 – 2016. Workshop and Colloquium Committee, Centre for Research in Human Development.

2014. Insight Development Grants Review Panel, Social Sciences and Humanities Research Council of Canada.
- 2012 - 2013. Steering Committee (Global Perspectives Representative), Centre for Research in Human Development, Concordia University.
2012. Poster Judge, Undergraduate Student Research Day, Concordia University.
2012. Member, Advisory Chair Search Committee, Department of Sociology and Anthropology, Concordia University.
2011. Organizer and Symposium Chair, *Agency and Meaning-Making in War-Affected Youth*, Centre for Research in Human Development, Concordia University.
2011. Organizer, *Trainee Practice Session for Oral Presentations*, Centre for Research in Human Development, Concordia University.
2011. Participant in Graduate and Professional Skills Focus Group, Concordia University.
- 2011, 2015, 2017. Poster Judge, Annual Conference of the Centre for Research in Human Development, Concordia University.
2009. Poster Judge, Graduate Student Symposium, Department of Education, Concordia University.
2009. Co-Organizer, Knowledge Translation Workshop, Centre for Research in Human Development.
- 2008 – 2009. Editor, *Dialogue Bulletin*, Centre for Research in Human Development.
2008. Organizing Committee and Student Axis Leader, Centre for Research in Human Development Annual Retreat.
- 2007 – 2008. Creative Team, *Dialogue Bulletin*, Centre for Research in Human Development.
- 2005 – 2007. Student Representative, CRDH Steering Committee.
- 2003 – 2006. Classroom Animator, *Brain Awareness Week*, Montreal, QC.
- 2003 – 2005. Student Representative, Graduate Committee, Department of Psychology, Concordia University.
- 2003 – 2004. Student Representative, Developmental Division, Canadian Psychological Association.

Departmental Service

2023. Chair, Departmental Hiring Committees for Limited Term Appointments in Early Childhood and Elementary Education (Internship Supervision) and Adult Education/Educational Studies.
2023. Organizer, Discussions on Inclusive Teaching Practices in Department of Education.
- 2022–2023. Associate Chair, Department of Education, Concordia University.
- 2022–2023. Chair, Ethics committee, Department of Education, Concordia University.
- 2022–2023. Chair, Undergraduate Program Group, Department of Education, Concordia University.
- 2022–2023. Chair, Equity, diversity, and inclusion committee, Department of Education, Concordia University.
2021. Equity, diversity, and inclusion committee member, Department of Education, Concordia University.
2021. ECEE/CHST Subcommittee for Canada Research Chair Letter of Intent.
2020. Department Hiring Committee, Limited Term Appointment in Child Studies and Early Childhood and Elementary Education, Concordia University.
- 2019-2021. Graduate Program Director, Child Studies, Department of Education, Concordia University.
- 2019–2020. Department Hiring Committee, Tenure-track search in Educational Technology, Concordia University.
- 2019-2021. Department Personnel Committee, Department of Education, Concordia University.
- 2019-2021. Awards Committee, Department of Education, Concordia University.
2018. Department Hiring Committee, LTA, Educational Studies.
- 2017 – 2018. Humanizing our Environment Committee, Department of Education, Concordia University.
- 2015 – 2016; 2018. Member, Education Doctoral Committee, Department of Education, Concordia University.
- 2014 – 2015; 2017-2018. Member, Colloquium Committee, Department of Education, Concordia University.
- 2012 - 2021. Member, Ethics Committee, Department of Education, Concordia University.

2011 – 2022. Member, Early Childhood and Elementary Education Program Committee, Department of Education, Concordia University.

2012. Member, Academic Standing Subcommittee, Early Childhood and Elementary Education, Department of Education, Concordia University.

2011-2012. Library Liaison. Department of Education, Concordia University.

2012. Chair, Professional Competencies Subcommittee (Methods Courses), Early Childhood and Elementary Education, Department of Education, Concordia University.

Media Interviews

2020. *Brains On Podcast*, Ruby Guthrie.

2019. *The New York Times*, Melinda Moyer.

2019. *Prof Talks*, Adam Vassallo.

2016. *Quartz media*, Corinne Purtill.

2015. *La Presse*, Marie Allard.

2014. *Geo Magazine*, Ute Eberle.

2014. *Ottawa Citizen*, Meagan Sylvester.

2013. *Periodista ABC del Bebé, El Tiempo*, Karen Johana Sanchez.

2012. *Montreal Families Magazine*, Renee Giblin.

2012. *CJAD*, Ric and Suzanne Show.

2012. *Radio Canada International*, Lynn Desjardins.

2010. *The New York Times*, Nicholas Bakalar.

2010. *The Globe and Mail*, Tralee Pearce.

2010. *CBC Radio British Columbia*, The Parent Project; On the Coast, Michelle Eliot.

2009. *Concordia Journal*, Anna Sarkissian.

NATHALIE ROTHSCHILD, PhD

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Date of preparation: October, 2022

EMPLOYMENT HISTORY

- 2018-Present **Lecturer, Extended Term Appointment:** Undergraduate Program Director, Early Childhood and Elementary Education, Concordia University
- 2017 **Student Achievement Officer:** Ontario Ministry of Education, French-Language Team, Literacy and Numeracy Secretariat
- 2015-2018 **Assistant Professor, Limited Term Appointment:** Early Childhood and Elementary Education and Child Studies, Department of Education, Concordia University
- 2014-2015 **Instructor:** Bachelor of Education Program, OISE, University of Toronto
- 2013 **Sessional Lecturer:** Concurrent Teacher Education Program, University of Toronto
- 2012-2014 **Teacher Education Program Assistant:** Dr. Eric Jackman Institute of Child Study, University of Toronto
- 2011 **Program Assistant:** Dr. Eric Jackman Institute of Child Study, University of Toronto
- 2010 **Scorer for Education Quality and Accountability Office (EQAO) Provincial Tests**
- 2010-2015 **Occasional Teacher, Kindergarten-Grade 8:** Toronto District School Board
- 2009-2010 **Grade 5/6 French Immersion Teacher:** Runnymede Junior and Senior Public School, Toronto District School Board
- 2007 **Research Officer:** The Learning Partnership (Toronto, Canada)

EDUCATION

- 2017 **Doctor of Philosophy, Developmental Psychology and Education**
Department of Applied Psychology and Human Development
Ontario Institute for Studies in Education (OISE), University of Toronto
Thesis: *A Comparison of Full-Day and Half-Day English and French Immersion Kindergarten: Children's Outcomes and Experiences*
- Awards and Honours
- | | |
|---|------------------|
| Ontario Graduate Scholarship (\$15,000/year) | 2012, 2013, 2014 |
| OISE Academic Excellence Award (\$2,000/year) | 2012, 2013, 2014 |
| Early Years Education: Ontario Network (EYEON) Research Grant (\$1,000) | 2012 |

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University of Toronto SGS Conference Grant (\$750) 2012
Doctoral Research Fellowship, OISE, University of Toronto (\$11,500/year) 2010, 2011

2009 **Master of Arts, Child Study and Education**
Dr. Eric Jackman Institute of Child Study, OISE, University of Toronto
Qualifying Research Paper: *English and French Literacy Development in Grade 1
French immersion: A Case Study*

Awards and Honours

Recipient of the Institute of Child Study Research Award upon graduation (\$200)

2006 **Bachelor of Arts, Honours, Psychology and French**
Dalhousie University and University of King's College
Honours Thesis (French) : *Serge Gainsbourg : Au-delà des limites de son époque et de
son pays pour réaliser la permanence culturelle*

PROFESSIONAL LICENSES

2017 Registered Early Childhood Educator (Member of the College of Early Childhood
Educators of Ontario, License # 62871)

2009 Ontario Certified Teacher (Member of the Ontario College of Teachers, License
#565728)

Additional Qualifications

Primary Part I

Special Education Part I

French as a Second Language Part I

New Teacher Induction Program (NTIP)

Accelerative Integrated Method (AIM), Part 1 (Teaching French with gestures approach)

LANGUAGE SKILLS

Oral and written proficiency in English and French

TEACHING

Courses taught at Concordia University

EDUC 395 – Internship III: Kindergarten Teaching

EDUC 396 – Kindergarten Teaching Seminar

EDUC 493 – Internship IV: Primary Teaching

EDUC 494 – Primary Teaching Seminar

EDUC 495 – Internship V: Upper Elementary Teaching

EDUC 496 – Upper Elementary Teaching Seminar

EDUC 295 – Internship I: Pre-Kindergarten Teaching

EDUC 296 – Pre-Kindergarten Teaching Seminar

EDUC 297 – Internship II: Observation and Evaluation in Education

EDUC 311 – Child Development II: The Ecology of the Family

EDUC 211 – Child Development I

EDUC 210 – Educational Psychology

October, 2022 2

Courses taught at OISE/University of Toronto

As an Instructor/Sessional Lecturer

EDUC 3506 – Psychological Foundations of Learning and Development

JSV 201H1 – Child and Adolescent Development in Education

As a Teaching/Program Assistant

APD 2220Y – Teaching Practicum

APD 2221Y – Advanced Teaching Practicum

APD 2211Y – Theory and Curriculum I: Language and Literacy

SERVICE

Graduate student supervision

2021-ongoing Arzoo Rupani (MA candidate, Concordia University)
Research topic: Home-school partnerships in early
childhood

Graduate student thesis committee membership

2022-ongoing Arielle Orsini (PhD candidate, Concordia University)
The affordances of concrete objects for early mathematics education. Supervised
by Dr. Helena Osana.

2022 Shiqiang (Eden) Jing (MA, Concordia University)
The more you read, the more you gain. Supervised by Dr. Sandra Martin-Chang

2021-2022 Camille Therrien (MA, Concordia University)
Quebec kindergarten teachers' perspectives on play-based learning. Supervised
by Dr. Sandra Chang-Kredl

2020-2021 Gregory Seiveright (MEd, Queen's University)
*Understanding educator perspective of French language instruction in play-based
Kindergarten.* Supervised by Dr. Kristy Timmons

2019-2020 Manzar Zare (MA, Concordia University)
*Stories of reading: Is recollection of reading instruction related to current print
exposure?* Supervised by Dr. Sandra Martin-Chang

2019-2021 Arielle Orsini (MA, Concordia University)
*The effects of manipulative function and perceptual richness on first-graders'
part-whole understanding.* Supervised by Dr. Helena Osana

2018-2021 Kelly Crowdis (MA, Concordia University)
*The impact of teacher professional development on students' learning and
achievement in spelling.* Supervised by Dr. Sandra Martin-Chang

2018-2021 Jessica Greiss (MA, Concordia University)
The impact of grading on elementary school students and teachers. Supervised by
Dr. Sandra Chang-Kredl

2017-2019 Shaneha Patel (MA, Concordia University)
*Examining the relationships between parent-child interactions and child
engagement during storybook reading.* Supervised by Dr. Sandra Martin-Chang.

2016-2017 Maya Rossi (MA, Concordia University)
Lexical quality and word reading fluency. Supervised by Dr. Sandra Martin-
Chang

2016-2017 Joleen Coirazza (MA, Concordia University)

Children's prosocial behaviour and internal state language during play with siblings and friends, as indicators of emotional regulation. Supervised by Dr. Nina Howe

Chairing of MA thesis defenses in the Department of Education

January, 2020	Fina Murphy-Gelderman
October, 2019	Fadwa Farhat
August, 2019	Alexandra Singer
December, 2018	Brittany Tremblay
January, 2018	Aryann Blondin
December, 2017	Cristina Casola
January, 2016	Daniela Colannino

Service to the Department of Education

2022	Interim Director, Concordia Observation Nursery
2022	Member of the Advisory Group to the Chair
2022	Member of Hiring Committee for LTA (ESL coordinator positions)
2021-ongoing	Member of the Equity, Diversity, and Inclusion Committee
2020	Chair of Hiring Committee for LTA (ECEE Internships and Supervision position)
2020	Member of Hiring Committee for LTA (ECEE and Child Studies Language Arts and Inclusive Education position)
2019-ongoing	Management and supervision of the ECEE Curriculum Resource Center project funded by the MEES' <i>Mandats stratégiques: Volet 1</i>
2019-2022	Committee member for the design and implementation of Inter-University workshops project funded by Quebec's Ministry of Education <i>Mandats stratégiques: Volet 2</i>
2019-ongoing	Member of Undergraduate Award Committee
2018-ongoing	Undergraduate Program Director for the Early Childhood and Elementary Education (ECEE) Program (includes student recruitment and advising, coordination of admissions, program design and maintenance, supporting full- and part-time faculty, working with the ECEE student association, and ensuring the program complies with Ministry requirements for teacher certification)
2018-ongoing	Director of ECEE Internships (includes arranging all school-based internships, liaising with principals and cooperating teachers, leading the ECEE internship team, and preparing all paperwork related to the internships)
2018-ongoing	Member of Concordia Teacher Education Council (CTEC)
2018-ongoing	Member of Department of Education Steering Committee (DESC)
2018-ongoing	Member of the Nadia Gagliano Award Committee
2018-ongoing	Member of the Sara Weinberg Award Committee

Service to the University

2020-ongoing	Member of the Faculty Tribunal Pool, Faculty of Arts and Science Representative
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Service to the Professional Community

2022	Invited talk (in French) at the ADEREQ/CAPFE meeting on preschool education: <i>Un programme BEPEP axé sur l'éducation préscolaire</i>
2021-2022	Member of the ADEREQ/CAPFE sub-committee on preschool education (in French)
2020	Invited talk at the Leadership Committee for English Education in Quebec (LCEEQ) board meeting: <i>Concordia's ECEE program: Overview, Highlights, and Future Directions</i>

- 2019-ongoing Concordia representative at the Table de concertation régionales de concertation des stages en enseignement du Grand Montréal
- 2018-ongoing Concordia representative on the Comité interuniversitaire sur la formation pratique en enseignement
- 2018-ongoing Concordia representative on the Special Needs Network of Anglophone Professionals (SNNAP)

Service to the Academic Community

- 2021 Member of External Peer Review Team (PRT) for Toronto Metropolitan University's (formally Ryerson University) Early Childhood Studies Program

Reviewer of manuscripts for the following journals:

- 2020 Journal of Research in Reading
- 2019 Reading and Writing Quarterly

Reviewer of proposals for the following conferences:

- 2014 Canadian Association for Teacher Education(CATE) division of the Canadian Society for the Study of Education
- 2013 Canadian Committee of Graduate Students of Education (CCGSE) of the Canadian Society for the Study of Education

RESEARCH

Publications

Garbati, J. & Rothschild, N. (2016). Lasting impact of study abroad experiences: A collaborative autoethnography. *Forum: Qualitative Social Research*, 17(2), Art. 23.

Pelletier, J., Rothschild, N., & Simons, K. (2014). Measurement of theory of mind from infancy through the early school years. In O. Saracho & B. Spodek (Eds.), *Contemporary Perspectives on Research in Theory of Mind in Early Childhood Education*. Information Age Publishing.

Garbati, J. & Rothschild, N. (2013). Creating a Positive Core French Learning Environment. *Réflexions* (Canadian Association of Second Language Teachers), 31 (3).

Conference presentations

Rothschild, N., Orsini, A., Osana, H, Skwarchuk, S., LeFevre, J., Lafay, A. & Maloney, E. (April, 2020). *20 or vingt? French immersion students' language choices when counting out loud*. Roundtable accepted for presentation at the American Educational Research Association Annual Meeting, San Francisco, California. (Conference canceled due to COVID-19).

Rothschild, N. (June, 2019). *“Tell me about your day”*: Children’s experiences in full-day and half-day French immersion kindergarten. Roundtable presented at the Canadian Society for the Study of Education Annual Meeting, Vancouver, British Columbia.

Rothschild, N. (July, 2017). *Full-day French immersion kindergarten: The impact of play-based learning on second-language reading scores*. Paper presented at the Society for the Scientific Study of Reading Annual Meeting, Halifax, Nova Scotia.

- Rothschild, N. (June, 2017). *Children's interpretations of early school experiences in French immersion*. Roundtable presented at the Canadian Society for the Study of Education Annual Meeting, Toronto, Ontario.
- Rothschild, N. (June, 2015). *Full-Day French immersion kindergarten: Educators' perspectives*. Roundtable presented at the Canadian Society for the Study of Education Annual Meeting, Ottawa, Ontario.
- Rothschild, N. & Beach, P. (May, 2014). *The role of support for teacher candidates in a two-year pre-service program*. Paper presented at the Canadian Society for the Study of Education Annual Meeting, St. Catharines, Ontario.
- Rothschild, N. & Garbati, J. (May, 2014). *Lasting impact of study abroad experiences: A collaborative autoethnography*. Paper presented at the Canadian Society for the Study of Education Annual Meeting, St. Catharines, Ontario.
- Pelletier, J., Timmons, K., & Rothschild, N. (May, 2014). *Children's social and self-regulation outcomes in Ontario's full-day and half-day kindergarten programs*. Paper presented at the Canadian Society for the Study of Education Annual Meeting, St. Catharines, Ontario.
- Rothschild, N. & Pelletier, J. (April, 2014). *Children's literacy development in full- and half-day English and second-language immersion kindergarten programs*. Paper presented at the American Educational Research Association Annual Meeting, Philadelphia, Pennsylvania.
- Rothschild, N., Simons, K., & Pelletier, J. (June, 2013). *"Draw a picture of yourself doing something at school": What children's drawings can tell us about their experiences in full- and half-day kindergarten programs*. Paper presented at the Canadian Society for the Study of Education Annual Meeting, Victoria, British Columbia.
- Simons, K., Rothschild, N., & Pelletier, J. (June, 2013). *Kindergarten students' clever solutions to a writing challenge*. Paper presented at the Jean Piaget Society Annual Meeting, Chicago, Illinois.
- Simons, K., Rothschild, N., & Pelletier, J. (April, 2013). *Play and work in kindergarten: What children enjoy and what they deem important*. Poster presented at the Society for Research in Child Development Biennial Meeting, Seattle, Washington.
- Pelletier, J., Rothschild, N., Brent, J., Gibson, A., & Corter, C. (July, 2012). *A framework for full-day early learning in Ontario: Voices of parents, staff and children in Best Start, half-day and full-day kindergarten programs*. Panel presentation at the International Innovations in Early Childhood Education Conference, Victoria, British Columbia.
- Pelletier, J., Brent, J., & Rothschild, N. (April, 2012). *Full-day kindergarten research: A collaboration among two school boards, a regional government and a university research team*. Invited presentation at the Association of Educational Researchers of Ontario Spring Conference, Woodbridge, Ontario.
- Pelletier, J., Simons, K., & Rothschild, N. (May, 2012). *Full-day early learning kindergarten: Year 1*. Invited presentation at the Canadian Society for the Study of Education Pre-Conference to the Canadian Association for Research in Early Childhood, Waterloo, Ontario.



**SENATE
OPEN SESSION
Meeting of May 17, 2024**

AGENDA ITEM: Academic Programs Committee recommendation: New programs: Graduate Certificate in Curatorial Studies and Practices (FA-ARTH-5506) and the Graduate Microprogram in Curatorial Studies (FA-ARTH-5507)

ACTION REQUIRED: For approval

SUMMARY: Senate is being asked to approve the following new programs:

- Graduate Certificate in Curatorial Studies and Practices (FA-ARTH-5506)
- Graduate Microprogram in Curatorial Studies (FA-ARTH-5507)

BACKGROUND:

The Faculty of Fine Arts would like to offer a Graduate Certificate in Curatorial Studies and Practices ("Graduate Certificate") and Graduate Microprogram in Curatorial Studies ("Graduate Microprogram").

To complete the 15-credit Graduate Certificate, the student is required to complete five (5) 3-credit courses: ARTH 676, ARTH 677, ARTH 678, ARTH 679, and three credits of electives selected from MA seminars offered from within the department or from across the university.

The 12-credit Graduate Microprogram consists of four (4) 3-credit courses: ARTH 676, ARTH 677, ARTH 678, and three credits of electives selected from MA seminars offered from within the department or from across the university.

The four courses of the Graduate Microprogram - which are the first four courses of the Graduate Certificate - provide a thorough grounding in current decolonized, inclusive, and sustainable curatorial theories and practices. The practicum (ARTH 679) provides the remaining three credits of applied knowledge to complete the Graduate Certificate.

Students in both programs take two 3-credit courses in the Fall session (ARTH 676 + elective), and two 3-credit courses in the Winter session (ARTH 677 + ARTH 678). To complete the Graduate Certificate, students must then also complete the practicum course ARTH 679 in the Summer session.

Students who choose only to complete the 12-credit Graduate Microprogram (and not to continue with the 3-credit practicum) will most likely be current curatorial practitioners who won't need the practicum experience. Completing the Graduate Microprogram will allow

them instead to apply the theoretical knowledge acquired to their existing professional curatorial practice.

To complete the 15-credit Graduate Certificate, students are required to complete four (4) newly created 3-credit courses: ARTH 676, ARTH 677, ARTH 678, ARTH 679, as well as three credits of electives selected from MA seminars offered from within the department or from across the university. ARTH 679 is the final course of the 4-course sequence described.

The programs were approved by the Academic Programs Committee on April 25, 2024.

DRAFT MOTION:

That, on recommendation of the Academic Programs Committee, Senate approve the new programs:

- Graduate Certificate in Curatorial Studies and Practices (FA-ARTH-5506) and
- Graduate Microprogram in Curatorial Studies (FA-ARTH-5507) as detailed in the attached documentation.

PREPARED BY:

Name: Secretary of Senate

Date: May 7, 2024

**ACADEMIC PROGRAMS COMMITTEE
REPORT TO SENATE
Sandra Gabriele, PhD
April 25, 2024**

The Academic Programs Committee requests that Senate consider the following changes for the Academic Calendar.

Following approval of the Faculty Councils, APC members reviewed the curriculum submissions listed below. As a result of discussions, APC resolved that the following curriculum proposal be forwarded to Senate for approval:

Undergraduate Curriculum Proposals (Changes for the 2025-26 Calendar)

Gina Cody School of Engineering and Computer Science

Concordia Institute for Information Systems Engineering
GCS-CIISE-5564; **APC-2024-2-D1**

- New Program: BEng in Cybersecurity Engineering

GCS-CIISE-5566; **APC-2024-2-D2**

- New Program: BSc in Cybersecurity

Graduate Curriculum Proposals (Changes for the 2024-25 Calendar)

Faculty of Arts and Science

Department of Education
AS-EDUC-5510; **APC-2024-3-D1**

- New Program: Graduate Diploma in Teacher Certification (For January 2025 Implementation)

Faculty of Fine Arts

Department of Art History
FA-ARTH-5506; **APC-2024-3-D2** (For September 2025 Implementation)

- New Program: Graduate Certificate in Curatorial Studies and Practices

FA-ARTH-5507; **APC-2024-3-D3** (For September 2025 Implementation)

- New Program: Microprogram in Curatorial Studies



Sandra Gabriele, PhD
Vice-Provost, Innovation in Teaching and Learning
April 25, 2024

Summary and Rationale for Changes

(see the program description and rationale in the program proposal for more details)

This dossier (**ARTH-5506**) proposes the creation of a 15-credit *Graduate Certificate in Curatorial Studies and Practices*.

The accompanying dossier (**ARTH-5507**) proposes the creation of a 12-credit *Microprogram in Curatorial Studies*.

Both programs were proposed in one LOI and the program proposal in both dossiers is the same.

To complete the 15-credit *Graduate Certificate in Curatorial Studies and Practices*, students are required to complete four (4) newly created 3-credit courses: ARTH 676, ARTH 677, ARTH 678, ARTH 679, as well as three credits of electives selected from MA seminars offered from within the department or from across the university. ARTH 679 - the final course of the 4-course sequence described above - is a curatorial project/practicum that allows students to apply the theoretical knowledge gained thus far.

The 12-credit *Microprogram in Curatorial Studies* consists of three (3) of the newly created 3-credit courses: ARTH 676, ARTH 677, ARTH 678, and three credits of electives selected from MA seminars offered from within the department or from across the university. The Microprogram does not include the 3-credit practicum course (ARTH 679) and is aimed at students who are already working in the curatorial area. Students receive a letter of attestation upon completion of the microprogram. Students who complete the microprogram can – if they decide to – then complete the practicum course (ARTH 679) and receive the graduate certificate. As such, the microprogram can be ‘stacked’ into the graduate certificate.

The proposal addresses requests made in the memo from the Vice-Provost, Innovation in Teaching and Learning:

1. Clarification of program titles.
2. Greater inclusion and highlighting of skills development within the program.
3. Clarification of admissions requirements.
4. Clarification of scheduling options for working students.
5. Impact of the proposed programs on the existing Art History MA

Resource Implications

There are minimal resource implications which have been reviewed and approved by the Dean of Fine Arts. See the budget (appendix 7) for more details.

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 17 May 2024

Approved by:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 16 Apr 2024

Following approval of the Faculty Councils, APC members reviewed the curriculum submission FA-ARTH-5506; APC-2024-3-D2.

As a result of discussions, APC resolved that FA-ARTH-5506; APC-2024-3-D2 be forwarded to Senate for approval.

Summary of Committee Discussion: CSGS approval

For Submission to:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 16 Apr 2024

Approved by:

Faye Diamantoudi, Dean of Graduate Studies,
Council of the School of Graduate Studies, 22 Mar 2024

The CSGS approved the enclosed curriculum changes in their final form (GCC 2324 4 D2). I therefore recommend that the Academic Programs Committee approve the aforementioned proposal.

Summary of Committee Discussion: GCC approval

For Submission to:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 16 Apr 2024

Approved by:

Rachel Berger, Associate Dean, Academic Programs and Development,
Graduate Curriculum Committee, 04 Mar 2024

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2324 7 D6). I therefore recommend that the Academic Programs Committee approve and recommend to Senate the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Dr. Rachel Berger, Associate Dean, Academic Programs and Development, School of Graduate Studies,
Graduate Curriculum Committee, 04 Mar 2024

Approved by:

Dr. Annie Gerin, Dean, Faculty of Fine Arts,
Faculty Council, 16 Feb 2024

The Fine Arts Faculty Council reviewed and approved the ARTH-5506 curriculum dossier at their meeting of February 16, 2024.

We hereby submit this dossier for review by the Graduate Curriculum Committee on March 4, 2024.

There are minimal resource implications which have been reviewed and approved by Dr. Annie Gerin, Dean, Faculty of Arts.

Summary of Committee Discussion: Faculty Curriculum Approval (FCC/FAPC)

For Submission to:

Dr. Annie Gerin, Dean, Faculty of Arts,
Faculty Council, 16 Feb 2024

Approved by:

Dr. Elaine Cheasley Paterson, Associate Dean, Academic Programs and Pedagogy,
Faculty Curriculum Committee, 17 Jan 2024

The Faculty of Fine Arts Curriculum Committee reviewed and approved the ARTH-5506 curriculum dossier at their meeting of January 17, 2024.

We hereby submit this dossier for review by the Faculty Council on February 16, 2024.

There are minimal resource implications which have been reviewed and approved by Dr. Annie Gerin, Dean, Faculty of Arts.

NOTE:

Summary of Committee Discussion: Department approval

For submission to:

Elaine Cheasley Paterson, Associate Dean, Academic Programs and Pedagogy,
Faculty Curriculum Committee, 17 Jan 2024

Approved by:

John Potvin, Department Chair,
Department Council, 10 Mar 2023

The members of Department Council approved the curriculum changes below at a meeting on March 10, 2023:


- Creation of 12-credit Microprogram in Curatorial Studies
- Creation of 15-credit Graduate Certificate in Curatorial Studies and Practices

**NEW PROGRAMS PROPOSAL
– FAST-TRACK PROCESS**

Letter of Intent for new Programs may enter the Fast-Track Process under the following conditions:

- The program meets an academic, strategic and/or societal need; and
- There are no significant resource demands implied by the process; and,
- The program does not require MEES approval.

GENERAL INFORMATION

Name of Proposed Program and Nomenclature:	1. Graduate Certificate in Curatorial Studies and Practices 2. Graduate Microprogram in Curatorial Studies
Hosting unit(s):	Department of Art History
Proposed Start Date:	Fall 2025
Prepared by:	Alice Ming Wai Jim, Michelle McGeough, Heather Igloliorte, Joana Joachim, Rebecca Duclos, Marie-Ève Marchand, Christopher Cooke
Dean Signature(s):	
Date:	21 December 2023

PROPOSED PROGRAM INFORMATION

1. Program Description (approx. 1 page):

a. Provide a brief description of the program and its rationale.

Description

The Graduate Certificate in Curatorial Studies and Practices is a 15-credit program that consists of the four courses that form the 12-credit Microprogram in Curatorial Studies and a 3-credit practicum course. The Certificate and Microprogram are taught through a decolonized, inclusive, and sustainable lens, providing graduates of the program with the necessary theoretical and practical skills to work successfully in the field. Students who complete the stand-alone Microprogram in Curatorial Studies will receive a letter of attestation. The Microprogram can be stacked into the

Graduate Certificate in Curatorial Studies and Practices with the addition of the 3-credit practicum course (ARTH 679). Alternatively, students may enroll directly into the Graduate Certificate in Curatorial Studies and Practices and complete the five required courses. The 3-credit practicum (ARTH 679) is not a stand-alone course and can only be completed by either completing the 12-credit Microprogram, or by completing the first four courses of the Graduate Certificate.

The Graduate Certificate relies on a core set of pedagogical principles: curating is a malleable and mobile craft with its own histories, practices, and locations that need to be continually reviewed and renewed as part of a larger cultural critique; curating is both a topic of study and a lived practice making the experience, training, acquired wisdom, and place-based knowledges that individuals bring to a graduate program another form of “expertise” to be shared; curating is often site-responsive or site-specific with individuals, often embedded in communities of practice, who require new modes of curriculum delivery to bring research, reflection, analysis, and peer-networks to the learner in-situ.

The planned inclusive, decolonized program design allows us to rethink possible outcomes for diverse groups of learners. As evidenced in the environmental scan (see **Appendix 1**) prepared as part of the development of this program, there is a lack of focus on decolonizing and sustainability efforts in similar curatorial programs which places our proposed Certificate as a leader in this area. The unique program design for the Graduate Certificate in Curatorial Studies and Practices relies upon a set of courses developed in concert with members of the Department of Art History and invited scholars and practitioners.

Rationale

It is an exhilarating, exciting, and challenging time for cultural workers across the globe. As we near the first quarter of the twenty-first century, we can see just how much the field of curatorial practice has expanded and evolved in conjunction with rapid societal change. While museums, galleries, performance and presentation spaces, artist-run organizations, collectives, and collaboratives develop new modes of public engagement, interpretive practice, and community consultation, the role of the “curator” grows increasingly complex. What does it mean to “curate” in today’s world? Attendant to these questions is, of course, the role of training and professional preparation: *what are the most vibrant responsive, and inclusive conditions for curatorial education today?* As traditional modes of collecting and curatorial authority are increasingly challenged by diverse publics and contemporary social movements such as Idle No More, Black Lives Matter and #StopAsianHate, it is urgent that the next generation of curators are trained in research and creating exhibitions which encourage new dialogues between artmakers, curators, community, and the public while encouraging sustainable curating practices in decolonized spaces.

Concordia Fine Arts is one of the largest comprehensive schools of arts, performance, and design in Canada. We are proud to be part of a university which “dares to be different and draws on its diversity to transform the individual, strengthen society and enrich the world.” Our Faculty has the institutional resources, the broad community support, the professional networks, and the international contacts to create a thriving program. The practical, theoretical, scholarly, and community-based expertise represented by faculty members in the Department of Art History is extensive and encompasses strategic areas of interest directly tied to the Certificate’s delivery: diversity, inclusion, Indigenous ways of knowing, anti-oppression pedagogy, social practice, community engagement, archival activation, historical precedents, institutional critique, intercultural and inclusive educational programming, material culture analysis, media production/dissemination, exhibition and interpretive design to name but a few. The Graduate Certificate relies on the research and teaching strengths of the Department and utilizes resources uniquely available within the

Faculty of Fine Arts' eight other academic units and associated cultural spaces within and outside the University.

The inclusion of 'Practices' in the title of the proposed Graduate Certificate highlights the practical nature of the program and importance placed on experiential learning and the goal to prepare program graduates for the reality of working in the field of Curation.

b. Describe the target audience of the program and admissions requirements and targets.

Target audience

The intended audience is plural "audiences" in our case. The Department of Art History's Graduate Certificate in Curatorial Studies and Practices employs a unique stackable program design that would be the first of its kind in Canada (perhaps internationally) to meet advanced, "seasoned" learners *where they are* in their own academic, professional, cultural, geographical moment in order to bring their specific context into the course material and class discussion. The program intends to be accessible to a wide range of learners. We openly welcome a diversity of individuals who choose to pursue advanced training, professionalization, expanded peer networking, and critical deepening of their cultural work within complex societies. Our program would be designed to guide and nurture arts and non-art graduates pursuing historical or material practices; early-career professionals; transitioning cultural workers; non-traditional learners; as well as individuals and those working as part of collectives. The Department of Art History's commitment to equity, diversity, inclusion, sustainability, and accessibility is fundamental to this effort to make this program accessible to as wide a range of students as possible. Students at Concordia may complete all work in French and, as such, these programmes may appeal to both francophone and French-speaking students seeking this approach to pedagogy and the opportunity to complete the practicum in a French-speaking institution.

Admissions requirements

1. In order to achieve the program's goal of being accessible to a wide range of learners, applicants must either:
 - a. Possess a bachelor's degree in museology, art history, curatorial studies, visual arts, art education, cultural/history studies, or a related field.
 - or:**
 - b. Have professional equivalency or have followed a non-traditional educational path or lived experience. This will be evaluated on the basis of a letter of intent that includes:
 - i. An account of the student's professional experience in the fields of museology, art history, curatorial studies, visual arts, art education, cultural/history studies or a related field, focusing on transferable skills obtained through these experiences.
 - ii. A detailed CV that includes the student's educational and professional pathway to date.
 - iii. Two letters of reference from previous employers, collaborators, community members, etc.
 - iv. Students may include a description of any completed curating projects and, if possible, budget and funding information.
2. *Proficiency in English:* applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the Graduate Admission page for further information on the Language Proficiency requirements and exemptions.

Target

Expected number of students:12-16.

2. Curriculum (approx. 2 -3 pages):

- a. Describe the overall program objectives, as well as a description of the specific learning outcomes of the degree. A curriculum map should be included.**

The 12-credit Microprogram in Curatorial Studies, or the first four courses of the Graduate Certificate in Curatorial Studies and Practices, aim to advance studies that are foundational to the specialization in curatorial history, theory, and practice. Participants will examine and discuss major issues and topics across a range of methodological and theoretical approaches through a decolonial lens.

The 3-credit practicum required to complete the Graduate Certificate will allow students to implement the skills they have acquired to design critical, sustainable, accessible curatorial spaces, and to develop inclusive cultural programs and exhibitions.

Program learning outcomes:

By the end of the **12-credit Microprogram in Curatorial Studies, or the first four courses of the Graduate Certificate in Curatorial Studies and Practices**, students will be able to:

1. Call into question and critically discuss historical and current trends in curatorial practice, theory, criticism, and community engagement as case studies and exemplars for contemporary practice;
2. Analyze and critique the conceptual, aesthetic, and ethical challenges of inclusive curatorial practices within a variety of institutional and non-institutional milieus;
3. Develop a critical curatorial practice and apply their knowledge of the milieu to design an independent curatorial, public programming, educational, interpretive, evaluative, or research-based project;
4. Research, identify, construct and evaluate arts programming that is consistent with the vision and mandate of organizations that promote decolonization efforts.

By the end of the **3-credit practicum (ARTH 679)** students will be able to:

1. Demonstrate an ability to realize a physical project in an advanced format that may be exhibited, installed, published, distributed, funded, enacted, or activated in a reportable manner, applying the theoretical principles presented in ARTH 678.
2. Develop strategies to define their own career objectives and understanding of the arts sector through building networks that will inform their professional goals while allowing them to practice advocacy skills on behalf of the arts they represent.

- b. Describe in detail the curriculum of the program, including how students are expected to progress through the program. If the program is designed to be a pathway program (e.g., stacked degrees), please outline what other curricular changes beyond this proposal are needed to support this objective.**

Program structure

To complete the 15-credit Graduate Certificate in Curatorial Studies and Practices, the student is required to complete five (5) 3-credit courses: ARTH 676, ARTH 677, ARTH 678, ARTH 679, and three credits of electives selected from MA seminars offered from within the department or from across the university.

The 12-credit Microprogram in Curatorial Studies consists of four (4) 3-credit courses: ARTH 676, ARTH 677, ARTH 678, and three credits of electives selected from MA seminars offered from within the department or from across the university.

The four courses of the Microprogram - which are the first four courses of the Graduate Certificate - provide a thorough grounding in current decolonized, inclusive, and sustainable curatorial theories and practices. The practicum (ARTH 679) provides the remaining three credits of applied knowledge to complete the Graduate Certificate.

Students in both programs take two 3-credit courses in the Fall session (ARTH 676 + elective), and two 3-credit courses in the Winter session (ARTH 677 + ARTH 678). To complete the Graduate Certificate, students must then also complete the practicum course ARTH 679 in the Summer session. Students who choose only to complete the 12-credit Microprogram (and not to continue with the 3-credit practicum) will most likely be current curatorial practitioners who won't need the practicum experience. Completing the 12-credit Microprogram will allow them instead to apply the theoretical knowledge acquired to their existing professional curatorial practice.

Graduate Certificate and Microprogram:

Certificate		Session	Courses
15-credit Graduate Certificate in Curatorial Studies and Practices	12-credit Microprogram in Curatorial Studies	F	ARTH 676: Introduction to curatorial practice and theory (3 credits) Elective (3 credits)
		W	ARTH 677: Advanced topics in curatorial practice and theory (3 credits) ARTH 678: Exhibition concept design (3 credits)
	3-credit practicum	S	ARTH 679: Curatorial project (3 credits)

Required courses: The new courses ARTH 676, ARTH 677, and ARTH 678 are required courses for students in the Microprogram in Curatorial Studies. The same courses and the new course ARTH 679 are required courses for students in the Graduate Certificate in Curatorial Studies and Practices. Note that ARTH 676 may be cross-listed with the existing ARTH 649 – Aspects of Curatorial Practice, a 3-credit seminar course that the Art History department already teaches in this area.

Elective course: chosen from the roster of MA seminars on offer within the department of Art History or from outside the Department's offering with permission from the GPD in Art History. This will enable students to deepen their knowledge in an area or topic particularly relevant and informative to their curatorial training, approach, or project.

Course sequence and completion schedule: Courses must be taken in the order listed above, as each course builds on the previous course. They function as interconnected knowledge blocks and as a result, must be taken in sequence. The courses are designed to facilitate integration of theory and practice. Each course will reinforce previous learning while introducing new concepts and specialized topics. At the completion of the Microprogram in Curatorial Studies or the first four courses of the Graduate Certificate in Curatorial Studies and Practices, students will have developed a robust understanding of curatorial histories and theories and have the ability to evaluate and critique these notions. Students will also have acquired curatorial design skills that will culminate in the 3-credit summer practicum with ARTH 679.

To provide greater access to students with work or other weekday commitments, seminars may be scheduled once a week in the evenings or alternatively in condensed format, over several weekends or several evenings over fewer weeks for example. Additionally, all courses are able to incorporate hybrid or blended teaching modalities which can increase flexibility and accessibility to the program.

In exceptional circumstances, and with medical or supporting documents and approval of the department, a student may interrupt their studies. All remaining courses must be completed in the subsequent term when the course is offered. Students who are unsuccessful in a given course would need to wait until the course is offered again in another academic year.

(See **Appendix 2** for curriculum mapping)

Course descriptions:

ARTH 676: Introduction to curatorial practice and theory (3 credits)

This seminar introduces the students to the histories and theories of curatorial practices in various local, national, and international contexts. It also explores a range of historical, social, economic, educational, ethical, legal, technological, and administrative issues concerning curation and various types of institutions. The course introduces both theoretical and historical aspects of curatorial practice from an array of perspectives such as, but not limited to, Indigenous, Black, queer, feminist, and decolonial approaches, and methodologies including cultural analysis, institutional critique, and activist interventions, to cite only a few examples. The choice of topics will vary depending on the expertise of the faculty member.

ARTH 677: Advanced topics in curatorial practice and theory (3 credits)

This course integrates both theoretical and practical aspects of curatorial practice through a decolonized, anti-oppression, inclusive, and sustainable lens. Curatorial engagements from an array of theoretical perspectives and methodologies such as cultural analysis, collaboration, institutional critique, performative interventions, and networked interactivity are investigated. Current debates concerning how exhibitions function as forms of research and knowledge production, as well as their ideological and social conditions are also examined. The choice of topics will vary depending on the expertise of the faculty member.

ARTH 678: Exhibition concept design (3 credits)

This course focuses on the research and planning process of a significant project that can be actualized in ARTH 679: Curatorial Project. In addition to developing practical professional skills for exhibition design, such as proposal preparation and budget management, students gain theoretical professional experience by drafting a prospectus or other first deliverable for the project and presenting this to the cohort to refine and strengthen the final work. The course takes advantage of projects, available spaces, planned cultural events or exhibitions taking place in any given year. Students become familiar with the diverse facets and various functions of a given professional environment on a theoretical level.

ARTH 679: Curatorial project (3 credits) [practicum]

Students carry out the project researched and planned in ARTH 678, allowing them to be involved from inception to completion. The goal of this practicum is to provide students with the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work. The hands-on experience and training aspect is enhanced through the supervision and mentorship of the faculty teaching the course as well as the site supervisor. During the practicum course, students gain professional experience through the realization of a significant project.

(See **Appendix 3** for sample syllabi and **Appendix 4** for internship agreement for ARTH 679)

- c. Describe the innovative or distinguishing features adopted in the design, delivery and pedagogy of the program (e.g., ties to future skills development, online/flipped components, experiential learning opportunities, flexibility in design through stacked certificates, etc).**

A key distinguishing feature of this Graduate Certificate is the progression from 'theoretical' concepts of curatorial studies and practices in the Microprogram in Curatorial Studies or the first four courses of the Graduate Certificate in Curatorial Studies and Practices to the practical application in the 3-credit practicum (ARTH 679). This flexibility would allow, for example, students with considerable curatorial experience to decide to complete the 12-credit Microprogram in Curatorial Studies in order to remain up to date with current scholarship and approaches to the field and forego the 3-credit experiential practicum. It also allows students to stack the Microprogram into the Graduate Certificate. As can be seen in the environmental scan, similar programs rarely offer this kind of flexibility that allows students to tailor their educational pathway to their individual needs.

The 3-credit practicum (ARTH 679) provides added value as the practical project work undertaken will benefit students who wish to pursue a career in the field by demonstrating that they have both subject matter and application expertise. Those students who complete the 3-credit practicum will leave the program with a strong portfolio which will be invaluable as they seek positions in the curatorial field. The 3-credit practicum is based on principles of experiential learning, the practical nature of which encourages 'learning by doing'.

Other distinguishing features include (a) a uniquely modular design utilizing multiple pathways to suit students' individualized needs; (b) an elective chosen from an array of courses covering historical, theoretical, professional, technical, research-based topics, among others; and (c) accessible entrance requirements welcoming students from diverse backgrounds and professional fields who have an interest in curation in its broadest terms. The environmental scan shows that the inclusion of an elective course differentiates this program from many other curatorial programs in that it allows

students to select courses that address their specific area of interest. The scan also shows that most post-graduate programs require all students to have an undergraduate degree. However, our admission requirements will open up the program to a broader, more diverse range of students.

Concordia itself is uniquely valuable as a site for students in this Graduate Certificate to engage with through multiple professional endeavours including the anticipated Curatorial Lab planned with donor support as a space of experimentation and dissemination of the curatorial research of this Graduate Certificate. The initial two years and the set-up of the costs of the Lab will be covered by the donor. There is also the established FOFA Gallery, Leonard & Bina Ellen Art Gallery, Jarislowsky Institute for Studies in Canadian Art, Concordia Film Festival, 60 x 60, Studio 7, MFA Open Studios, Art Matters, among others.

Finally, the power of embedded, localized experience – and the need for guided, reflexive analyses of these experiences – is respected in the program design. Courses will create space for learners to envision their own communities as both “content” and “case study” for analysis, intervention, and reflection.

3. Demand and Societal Need (approx. 1 - 1.5 pages)¹:

- a. Describe how this program will address current or future societal needs, emerging trends in research and/or higher education.

Our proposed Graduate Certificate in Curatorial Studies and Practices would fill two interconnected needs at this time. First and foremost, it will help to professionalize and to diversify our program’s pedagogy and our graduate curriculum. Secondly, it will help improve our graduate students’ employability after they finish their degree.

Traditionally, art history graduate programs have trained students primarily for academic, classroom-based teaching and research (via coursework, teaching and research assistantships, conference presentations, etc.). Although the number of art history graduate programs have increased significantly in recent decades, the number of tenure-track teaching positions in universities, as well as the number of stable teaching positions in colleges and CÉGEPs, have not followed accordingly. Indeed, as noted in a study on the future of the PhD in the Humanities produced by McGill University in 2013, almost 80% of humanities graduates do not find employment in colleges/universities, and thus need to find positions in adjacent fields or in other professional areas. In light of these statistics, we feel that there is a growing need for art history graduates who have transferable skills and are able to communicate research and ideas to diverse publics outside of academia. By becoming active as curators and as researchers, our graduates will thus have greater chances to participate in new forms of knowledge transfer and to actively shape contemporary discourse in the cultural field. The proposed program would also allow the Art History department to address various pressing social questions, such as: the accessibility of museums and other exhibition spaces (disability, neurodivergence, etc.); the diversity in museum and curatorial staff; the structural changes in museums reflecting evolving social values (e.g. equity-deserving groups, LGBTQ+ rights, multiple intersecting histories, sustainability in curatorial practices, Truth and Reconciliation/Indigenous rights), as well as the formative role of various new technologies on museum and exhibitions spaces in a post-COVID world. These social issues are integral to the Faculty of Fine Arts’ Strategic Plan and Concordia’s strategic directions.

¹ The Office of Institutional Planning and Analysis should be consulted. Other possible data points also include labour market data supplied by the provincial and federal governments, other reports that reference future job skills. The Office of the Vice-Provost, Innovation in Teaching and Learning also may be able to provide more refined data.

Furthermore, a new Graduate Certificate in Curatorial Studies and Practices will contribute to Concordia's Faculty of Fine Art's practice-led research streams and to our ongoing efforts towards offering different kinds of experiential learning opportunities. The Graduate Certificate would also encourage students, faculty, local museum professionals and cultural workers to collaborate on a regular, interdisciplinary basis. The Graduate Certificate will offer enrolled students the chance to work on curatorial projects through our associations with local institutions, while the large number of artist-run centres in the city are also potential partners. Indeed, the proposed Graduate Certificate will help emerging artists, art historians, and many other cultural workers to gain a socially grounded and critical understanding of curatorial histories and theories and provide them with a foundational knowledge of the various administrative frameworks, technical procedures and ethical protocols that are an essential part of curating art exhibitions and cultural projects today. The focus of our Graduate Certificate will help consolidate our Department's strong focus on modern-contemporary art and cultures in a global context, and will encourage a hands-on approach to the study of material and visual culture more broadly. The program will also seek to train students in the multiple forms of writing that intersect with curatorial projects: grant-proposals, interpretive panels, exhibition catalogues, etc. The end goal is to help our alumni find gainful employment in various types of professional settings, such as university galleries, museums, commercial spaces, print or online journals/magazines, "maisons de la culture", artists run centres, and not-for-profit organizations.

As can be seen in the environmental scan (**Appendix 1**), our proposed Graduate Certificate would meet a direct need in the Montreal area and in the province of Quebec as it would be the sole English-language curatorial program offered. While there are other similar programs in Quebec, two of them, the Certificat en muséologie et diffusion de l'art at UQÀM and the Certificat en muséologie et patrimoines at UQO Gatineau, are at the undergraduate level (30 credits) and are more focused on museum studies. In terms of graduate programs, there is the Diplôme d'études supérieures spécialisées en muséologie at Université Laval in Quebec City, but it is also focused on museums and is twice as long (30 credits instead of our proposed 15 credits structure). It is also outside of Montreal, and is thus geographically removed from our metropole's extensive network of museums, galleries, etc. The Department of Art History has a well-established bilingual graduate milieu fostered through its inter-university [doctoral program](#) (with UQAM and UdeM). Thus, ideally these programs would attract both English- and French-speaking students who are drawn to Concordia's offerings as a meeting of cultures with the shared goal of discovering and implementing decolonized methodologies. It is to be noted that students are able to submit coursework in both English and French. The proposed program would also be an interesting and affordable alternative for students coming from other Canadian provinces who might otherwise have enrolled in Carleton's, OCAD's or UBC's graduate programs, all of which are longer programs.

(See **Appendix 5** for letters of support from industry and **Appendix 6** for Market Research Report)

- b. Describe the type of students the program is expected to attract (e.g., lifelong learners, international students, etc.).

We anticipate various types of students for these new programs: recent art history graduates; independent curators/cultural workers wanting to sharpen their skills; long-time museum/community workers wanting to update their knowledge of the field; BIPOC arts workers wanting to enter the field, etc. Building on our existing strengths, we intend to develop a program that will be attractive to Indigenous students and students of colour as part of the larger project of ensuring a future of curatorial practice that is more inclusive. The admission requirements will make the Microprogram

and Graduate Certificate open to less traditional learners such as those who may not have an undergraduate degree but who have considerable relevant professional experience.

We expect that a significant number of applicants for this Microprogram and Graduate Certificate will be from Montreal and other towns in the province of Quebec, including some of our current undergraduates and MA in Art History students. Our programs will be open to students coming from other disciplines, such as geography, history, anthropology, science and technology studies, archival studies, etc. We also envision receiving applications from MFA students who are active as independent curators and/or who incorporate the display of archival material as part of their creative/art practices.

- c. Provide a rationale for how there is demonstrable student interest in, demand for and capacity to support the program (e.g., feeder programs at other institutions like cégeps or within Concordia; data indicating hiring trends or areas of growth in industries; data indicating the emergence of an important research field).

It is expected that there will be considerable interest in this Microprogram and Graduate Certificate from Art History, Art Education and Studio Arts students. Students from other Concordia programs in Sociology and Anthropology, History, Geography could be interested in our new programs. There is clear capacity to support the program as a number of the department's current faculty members have been, or are currently, active as curators, such as Dr. Alice Ming Wai Jim, Dr. Rebecca Duclos, Dr. Michelle McGeough, and Dr. Joana Joachim, and would be excellent mentors for our future students. This level of expertise could also lead to the creation of a course in which our various faculty members are invited to give a guest lecture on an important exhibition they have had the chance to study or curate, both in terms of its discourse but also its specific exhibition modalities (display, scenography, text, catalogue, etc.).

4. Institutional Fit (approx. 1 page): Provide an explanation of how the proposed program fits within the Faculty and University at large.

The culture and research output of the Department of Art History is in robust alignment with Concordia University's strategic plan and directions as described in the Strategic Research Plan (2018-23) as well as the Faculty of Fine Arts' [Strategic Plan](#) (2022-2027). With the recent tenure-track hiring of Dr. Balbir Singh for the Canada Research Chair in Art and Racial Justice (Tier 2), we are building upon existing research strengths in the areas of postcolonial approaches, critical race studies, migration studies, Indigenous and decolonizing analyses (May Chew, Alice Ming Wai Jim, Joana Joachim, Michelle McGeough) that align directly with core institutional priorities regarding equity, diversity, and inclusion. These moves to develop decolonized, anti-racist, and sustainable offerings are a cornerstone of the proposed Graduate Certificate. Similarly, we are expanding in new directions within long-established departmental areas of scholarly excellence, including visual and material culture (Elaine Cheasley Paterson, John Potvin, Johanne Sloan, Steven Stowell), Canadian art and architecture (Martha Langford, Nicola Pezolet, Anne Whitelaw), and feminisms and art history (Elaine Cheasley Paterson, Cynthia Hammond, Kristina Huneault, Michelle McGeough). Our department has also shown leadership in research-creation, interdisciplinary methodologies, oral history, and critical curatorial and museological work (Rebecca Duclos, Cynthia Hammond, Alice Ming Wai Jim), and it is precisely this latter cluster that is the direction in which we plan to expand with the proposed Graduate Certificate.

Our funded research projects, publications, and exhibitions are powerful means by which our faculty foster strong relationships with galleries, museums, artist-run centres, archives, publishers, and

community groups in Montreal and Quebec. This work is also a way in which we will be able to engage students in the Graduate Certificate program both in paid, career-relevant work, and in communities of practice that serve to foster professional networks well beyond the end of the program. In this way, our vibrant departmental culture means that students do not just benefit from faculty research; they are an intrinsic part of our research outputs and our knowledge mobilization. It is this dynamic that leads our students to being sought out for professional work in the arts upon graduation. Our alumni are now employed in key positions at the McCord Museum, the Montreal Museum of Fine Arts, the Canadian Centre for Architecture, Artex, the Museum of Jewish Montreal, the Canadian Clay and Glass Museum, the Musée d'art de Joliette, the National Gallery of Canada, and the Canadian Museum of Immigration at Pier 21. As the Graduate Certificate aims to attract students from other disciplines (History, Anthropology, Sociology, among others) this will lead to connections with a wider range of institutions and organizations.

The Department of Art History regularly collaborates with key campus spaces that support state-of-the-art research and research-creation. Our most frequent collaborations take place with the University-recognized research unit, the Gail and Stephen A. Jarislowsky Institute for Studies in Canadian Art (JI), presently directed by Dr Martha Langford. The JI hosts events and fosters team research initiatives that represent cutting-edge studies in settler-colonial art histories and Indigenous and diasporic art in the geopolitical territory of Canada. We also work frequently with 4th Space, Concordia's trans-faculty, research showcase, until 2023 directed by Dr Anna Waclawek, an alumna of our doctoral program. We co-host events, colloquia, and pedagogical activities in this street-level space, thus putting Art History on the ground and in the eyes and minds of our community. We have also worked with the Centre for Oral History and Digital Storytelling (COHDS), another University-recognized research unit (co-directed for three years by Dr Cynthia Hammond, who remains a core member) that supports oral history research-creation. Several faculty members and many students are affiliates of COHDS, which offers access to significant research facilities, including a computer lab and high-tech performance space, the Acts of Listening Lab, and offers student research. These spaces will prove beneficial to students of the Graduate Certificate program who are seeking professional and hands-on experience, and in turn these spaces will benefit from working with students and graduates who are steeped in current practices in curatorial studies.

Our students are in many ways the best illustration of how the Department of Art History aligns with, indeed, propels the University's strategic directions forward. Students in this Microprogram and Graduate Certificate will benefit from our four active student research groups: the Concordia Undergraduate Journal of Art History; the Art History Graduate Students Association; the Ethnocultural Art Histories Research group (a group that extends beyond Concordia); and Ylara, a student-run, undergraduate feminist art publication. These groups do remarkable work in recruiting future students and, in their well-established mentoring dynamic and community spirit, do much to welcome and retain current students in our programs.

5. Program Alignment within Unit (approx. 1 page): Describe how the program aligns with your unit/department. Please provide the rationale for alignment. Further, please indicate what, if any, programs or courses will be closed in its place, or how programs will be consolidated or re-packaged (e.g., why a new program is necessary, rather than revising an existing program).

- Program Area of Growth (an area of expansion)
- Program Area of Strength (capitalizes on existing strengths)

The Department of Art History offers several undergraduate programs in Art History (a Major and a Minor in Art History, and two combined programs with Studio Art and Film Studies, respectively) as well as an MA degree and a Doctoral degree, the latter of which is part of an inter-university program shared with the Université de Montréal, and the Université de Québec à Montréal. The Graduate Certificate in Curatorial Studies and Practices will complement these programs, all of which offer course content on issues relating to curation. The proposed program will impact most closely on the MA program, since 1 course (3 credits) of the Certificate will be drawn from MA course offerings (students in the Graduate Certificate may choose 3 credits of ARTH courses at the MA level). While students can pursue the Graduate Certificate independently of an MA or a PhD degree, it will serve as a complementary offering to those graduate students who are interested in developing expertise in curatorial issues as a means of gaining experience and knowledge relevant to this professional field.

The addition of the Graduate Certificate in Curatorial Studies to the Department of Art History's current offerings could result in an increase in the number of students within the MA in Art History by creating a bridge from undergraduate studies. Equally, MA graduates may decide to take the Graduate Certificate as an added specialisation to their MA studies. It is worth noting that students may and can enrol for the Graduate Certificate while in the MA History Art History program. At such time as there is a revision of the MA Art History program, consideration will be given to a more structured stacking of the Graduate Certificate within the MA.

Program Area of Growth

To offer this program, the Department will develop four new graduate-level courses. Three of the new courses (ARTH 676, ARTH 677 and ARTH 678) will be taught as part of the 12-credit Microprogram in Curatorial Studies (9 credits, 3 credits each). The remaining new 3-credit course (ARTH 679) constitutes the practicum required to complete the Graduate Certificate. These new courses will build on areas of expertise well established within the Department, as well as an existing internship course at the graduate level. Several faculty members have offered courses on targeted curatorial issues though this program will integrate these specialised classes into a focused curriculum.

The establishment of a 3-credit course that is specifically geared toward curatorial practices will build on existing internship course offerings in the MA program. This new course has the potential to strengthen existing community partnerships with Montreal institutions as well as to build new ties to community, and it will also give students the opportunity to develop their expertise in a more in-depth and intensive summer-long internship. A dedicated faculty supervisor of the 3-credit curatorial project course will foster connections with Montreal and Canadian institutions, which will have the potential to lead to further collaborations and possible employment opportunities for our students.

Program Area of Strength

The proposed Graduate Certificate in Curatorial Studies and Practices capitalises on existing scholarly, curricular, and administrative strengths of the Art History Department. Our MA program is one of the longest standing and leading graduate programs in Canada, noted for its strong focus on critical, contemporary, interdisciplinary, and community engaged approaches to the study of art. The Department boasts faculty with a wide range of research expertise, including those with expertise in curation and museology. Many of these faculty members currently teach courses on curatorial studies and practice in the context of Indigenous, Black, and Global Art Histories. They have supervised master's theses focused on curatorial issues and can serve as instructors and mentors in the Certificate program. Our department is situated within a rich research infrastructure that includes the Gail and Stephen A. Jarislowsky Institute for Studies in Canadian art, the *Journal of Canadian Art History*, the Canadian Women Artists History Initiative, and the Visual Collections

Repository. These provide ample opportunities for collaboration, mentorship, and professional networking. Given the strength of its current programs, the Art History Department is eager to develop this Graduate Certificate in Curatorial Studies and Practices to explore novel pedagogical design models, expand our internship capacity, and reach new student demographics.

6. Consultation (approx. 1 page):

- a. Describe the consultation processes that have been undertaken with potentially affected academic units and/or other stakeholders.

The Graduate Certificate in Curatorial Studies has been framed in consultation with the following members within and beyond Concordia University:

1. Dr. Annie G erin, Dean, Faculty of Fine Arts
2. Dr. John Potvin, Chair, Department of Art History
3. Camille Pouliot, Department Coordinator, Department of Art History
4. Dr. Elaine Paterson, Associate Dean, Academic Programmes and Pedagogy, Fine Arts
5. Marie-Ève Marchand, Facilitator, Academic Affairs, Fine Arts
6. Christopher Cooke, Facilitator, Academic Programmes and Pedagogy
7. Dalia Radwan, Curriculum Developer, Centre for Teaching and Learning
8. Gina Beltran, Developer, Graduate Academic Programs, School of Graduate Studies
9. Dr. Rachel Berger, Associate Dean, Academic Programs and Development, School of Graduate Studies
10. Dr. Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning
11. Julie Johnston, Manager, Curriculum Innovation and Development, Office of the Provost and Vice-President

- b. Describe the impact the new program will have on other, existing programs.

We envisage that the proposed Graduate Certificate in Curatorial Studies and Practices will attract recent Art History, Art Education and Studio Arts graduates as well as graduates from Arts and Sciences courses (Anthropology, History, etc.) The program will be a complementary offering to those graduates interested in developing their skills in curatorial issues. The existing Art History program most impacted will be the MA program as 1 course in the proposed program will be chosen as an elective from the MA course offerings.

- c. Describe what further collaborations or partnerships, if any, are being developed in order to support the program, if any.

The Department of Art History has existing collaborations and partnerships with the FOFA Gallery, 4TH Space, the Leonard & Bina Ellen Art Gallery, the Jarislowsky Institute for Studies in Canadian Art, 60 x 60 amongst others which will prove invaluable in the courses offered in this program, particularly with the practicum offered in ARTH 679.

Students in the program will have access to the Elspeth McConnell Critical Curatorial Laboratory, a state-of-the-art facility focused on developing, teaching, and exhibiting innovative perspectives, techniques and technologies in curatorial work. The Lab will be the practical hub of activities for students in the Certificate program where museum-grade preservation, archiving, handling and exhibition practices can be learned. The facility will ensure that Concordia takes a leading national role to foster the next generation of Canadian curators. The Lab will provide technical help and materials to allow for hands-on, problem-solving training.

Students in the program will also be in regular contact with the activities of the new Concordia University Research Chair in Critical Curatorial Studies and Decolonizing Art Institutions (Tier 1, 2023-2028), Dr Alice Ming Wai Jim. This CURC may employ graduate research assistants from the program to assist in, for example, programming and bibliographic research on key curatorial modalities and hard lessons learnt from Black Lives Matter Hires, as well as a conference on global Asian diasporas in the 21st century.

Students in this Graduate Certificate will also benefit from our four active student research groups: the Concordia Undergraduate Journal of Art History; the Art History Graduate Students Association; the Ethnocultural Art Histories Research group (a group that extends beyond Concordia); and Yiara, a student-run, undergraduate feminist art publication. Student research groups such as the Art History Graduate Students Association and Yiara, will help in recruiting future students and welcome and retain current students in our programs.

The network of alumni employed in key positions at the McCord Museum, the Montreal Museum of Fine Arts, the Canadian Centre for Architecture, and many others will be of enormous value when introducing students of the program to the industry and in the organization of internships and will allow for lectures and workshops to be offered by industry experts, to forge links with industry experts and greatly benefit graduate students who will have the opportunity to discuss their projects with seasoned professionals.

7. Resources and Budget: Keeping in mind that the Fast Track Process is meant for programs that have minimal resource implications, please indicate if any resources are required to start the program. Please provide a detailed budget with rationale for each budget line.

(See **Appendix 7**)

Summary of Changes (New Graduate Program (Fast Track))

Course Changes:

	Subject Code Change	Catalogue Number Change	Title Change	Description Code Change	Prerequisite Change	Note Change (any change to any of the items under "Notes")	Credit Value Change	Component Change	Mode of Instruction Change	Cross-listed Course Change
ARTH 676 Introduction to Curatorial Practice and Theory New	X	X	X	X			X	X	X	
ARTH 677 Advanced Topics in Curatorial Practice and Theory New	X	X	X	X	X		X	X	X	
ARTH 678 Exhibition Concept Design New	X	X	X	X	X		X	X	X	
ARTH 679 Curatorial Project New	X	X	X	X	X		X	X	X	

Regulation Changes:

- Admission Requirements Change
- Academic Regulations Change

REGULATIONS CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: Graduate Certificate in Curatorial Studies and Practices

Calendar Section Name: Admission Requirements

Calendar Section Type: Regulation

Description of Change: Admission Requirements Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Calendar publication date: 2025/2026/Fall

Type of change: Regulation Change

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Fine Arts Programs > Art History Programs > Graduate Certificate > Curatorial Studies and Practices

Present Text calendar

Admission Requirements

Proposed Text

Admission Requirements

- Bachelor's degree in museology art history, curatorial studies, visual arts, art education, cultural/history studies, or a related field.

- Alternatively, applicants with relevant professional experience, a non-traditional educational path or lived experience will be considered based on their application dossier.

- **Proficiency in English:** applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the English language proficiency page for further information on the requirements and exemptions.

Rationale:

Creation of admission requirements for this new program.

Resource Implications:

N/A

PROGRAM CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: Graduate Certificate in Curatorial Studies and Practices

Calendar Section Name: Graduate Certificate in Curatorial Studies and Practices

Calendar Section Type: Program

Description of Change: Graduate Certificate in Curatorial Studies and Practices New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Program Name:

Program Type: Course-based

Degree: Course-based

Calendar publication date: 2025/2026/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Aug 2025

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Fine Arts Programs > Art History Programs > Graduate Certificate > Curatorial Studies and Practices > Degree Requirements

Type of Change: New Program

Present Text calendar

credits

0

Proposed Text

15 Graduate Certificate in Curatorial Studies and Practices credits

0 12 credits:
ARTH 676 Introduction to Curatorial Practices and Theory (3)
ARTH 677 Advanced Topics in Curatorial Practice and Theory (3)
ARTH 678 Exhibition Concept Design (3)
ARTH 679 Curatorial Project (3)

3 credits chosen from MA seminars within the department of Art History or from across the university with permission of the Graduate Program Director.

Rationale:

Degree requirements for new Graduate Certificate.

Resource Implications:

There are minimal resource implications which have been reviewed and approved by the Dean of Fine Arts. See the budget (appendix 7) for more details.

REGULATIONS CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: Graduate Certificate in Curatorial Studies and Practices

Calendar Section Name: Academic Regulations

Calendar Section Type: Regulation

Description of Change: Academic Regulations Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Calendar publication date: 2025/2026/Fall

Type of change: Regulation Change

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Fine Arts Programs > Art History Programs > Graduate Certificate > Curatorial Studies and Practices

Present Text calendar

Academic Regulations Academic Regulations

Proposed Text

Academic Regulations Academic Regulations

1. **Academic Standing.** Please refer to the Academic standing section of the Calendar for a detailed review of the Academic regulations .

2. **Time Limit.** Please refer to the Academic regulations page for further details regarding the Time limits . It is expected that students will normally complete the certificate within one year.

3. **Graduation Requirement.** In order to graduate, students must have a minimum cumulative GPA of 2.70.

Rationale:

Creation of academic regulations for this new program.

Resource Implications:

There are minimal resource implications which have been reviewed and approved by the Dean of Fine Arts. See the budget (appendix 7) for more details.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: Graduate Certificate in Curatorial Studies and Practices

Calendar Section Name: ARTH 676

Calendar Section Type: Course

Description of Change: ARTH 676 Introduction to Curatorial Practice and Theory New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Calendar publication date: 2025/2026/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Aug 2025

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Fine Arts Courses > Art History Courses > Curatorial Studies and Practices Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[ARTH 676 Introduction to Curatorial Practices and Theory \(3 credits\)](#)

Prerequisites:

Prerequisites:

Description :

Description :

This seminar introduces the students to the histories and theories of curatorial practices in various local, national, and international contexts. It also explores a range of historical, social, economic, educational, ethical, legal, technological, and administrative issues concerning curation and various types of institutions. The course introduces both theoretical and historical aspects of curatorial practice from an array of perspectives such as, but not limited to, Indigenous, Black, queer, feminist, and decolonial approaches, and methodologies including cultural analysis, institutional critique, and activist interventions, to cite only a few examples. The choice of topics will vary depending on the expertise of the faculty member.

Component(s):

Component(s):

Seminar

Notes :

Notes :

Rationale:

This course has been created as part of the new Graduate Certificate in Curatorial Studies and Practices, and the new Microprogram in Curatorial Practices.

Resource Implications:

There are minimal resource implications which have been reviewed and approved by the Dean of Fine Arts. See the budget (appendix 7) for more details.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: Graduate Certificate in Curatorial Studies and Practices

Calendar Section Name: ARTH 677

Calendar Section Type: Course

Description of Change: ARTH 677 Advanced Topics in Curatorial Practice and Theory New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Calendar publication date: 2025/2026/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Aug 2025

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Fine Arts Courses > Art History Courses > Curatorial Studies and Practices Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[ARTH 677 Advanced Topics in Curatorial Practice and Theory](#) (3 credits)

Prerequisites:

Prerequisites:

[The following course must be completed previously: ARTH 676](#)

Description :

Description :

This course integrates both theoretical and practical aspects of curatorial practice through a decolonized, anti-oppression, inclusive, and sustainable lens. Curatorial engagements from an array of theoretical perspectives and methodologies such as cultural analysis, collaboration, institutional critique, performative interventions, and networked interactivity are investigated. Current debates concerning how exhibitions function as forms of research and knowledge production, as well as their ideological and social conditions are also examined. The choice of topics will vary depending on the expertise of the faculty member.

Component(s):

Component(s):

Seminar

Notes :

Notes :

Rationale:

This course has been created as part of the new Graduate Certificate in Curatorial Studies and Practices, and the Graduate Microprogram in Curatorial Studies.

Resource Implications:

There are minimal resource implications which have been reviewed and approved by the Dean of Fine Arts. See the budget (appendix 7) for more details.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: Graduate Certificate in Curatorial Studies and Practices

Calendar Section Name: ARTH 678

Calendar Section Type: Course

Description of Change: ARTH 678 Exhibition Concept Design New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Calendar publication date: 2025/2026/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Aug 2025

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Fine Arts Courses > Art History Courses > Curatorial Studies and Practices Courses

Type of Change: New Course

Present Text calendar

Proposed Text

[ARTH 678 Exhibition Concept Design](#) (3 credits)

Prerequisites:

Prerequisites:

The following course must be completed previously: [ARTH 676](#) . The following course must be taken previously or concurrently: [ARTH 677](#)

Description :

Description :

This course focuses on the research and planning process of a significant project that can be actualized in [ARTH 679 : Curatorial Project](#), or later in their career . In addition to developing practical professional skills for exhibition design, such as proposal preparation and budget management, students gain theoretical professional experience by drafting a prospectus or other first deliverable for the project and presenting this to the cohort to refine and strengthen the final work. The course takes advantage of projects, available spaces, planned cultural events or exhibitions taking place in any given year. Students become familiar with the diverse facets and various functions of a given professional environment on a theoretical level.

Component(s):

Component(s):

[Seminar](#)

Notes :

Notes :

Rationale:

This course has been created as part of the new Graduate Certificate in Curatorial Studies and Practices, and the Microprogram in Curatorial Studies.

Resource Implications:

There are minimal resource implications which have been reviewed and approved by the Dean of Fine Arts. See the budget (appendix 7) for more details.

COURSE CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: Graduate Certificate in Curatorial Studies and Practices

Calendar Section Name: ARTH 679

Calendar Section Type: Course

Description of Change: ARTH 679 Curatorial Project New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Calendar publication date: 2025/2026/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Aug 2025

Path: Graduate > See Summer 2024 Graduate Calendar > Courses > Fine Arts Courses > Art History Courses > Curatorial Studies and Practices Courses

Type of Change: New Course

Present Text calendar

Proposed Text

Prerequisites:

Prerequisites:

The following courses must be completed previously: ARTH 676 , ARTH 677 , ARTH 678 .

Description :

Description :

Students carry out the project researched and planned in ARTH 678, allowing them to be involved from inception to completion. The goal of this practicum is to provide students with the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work. The hands-on experience and training aspect is enhanced through the supervision and mentorship of the faculty teaching the course as well as the site supervisor. During the practicum course, students gain professional experience through the realization of a significant project.

Component(s):

Component(s):

Practicum/Internship/Work Term

Notes :

Notes :

Rationale:

This course has been created as part of the new Graduate Certificate in Curatorial Studies and Practices, and the Graduate Microprogram in Curatorial Studies.

Resource Implications:

There are minimal resource implications which have been reviewed and approved by the Dean of Fine Arts. See the budget (appendix 7) for more details.

Impact Report

Courses

ARTH 676 Introduction to Curatorial Practice and Theory New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Fine Arts Courses -> Art History Courses -> Curatorial Studies and Practices Courses
Source of Impact

ARTH 677 Advanced Topics in Curatorial Practice and Theory New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Fine Arts Courses -> Art History Courses -> Curatorial Studies and Practices Courses
Source of Impact

ARTH 678 Exhibition Concept Design New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Fine Arts Courses -> Art History Courses -> Curatorial Studies and Practices Courses
Source of Impact

ARTH 679 Curatorial Project New

Graduate -> See Summer 2024 Graduate Calendar -> Courses -> Fine Arts Courses -> Art History Courses -> Curatorial Studies and Practices Courses
Source of Impact

Other Units

Addition of **Academic regulations** to **Academic Regulations** requirement

Source of other unit Impact

- Sub Section is housed in Academic regulations

Addition of **Time Limits** to **Academic Regulations** requirement

Source of other unit Impact

- Regulation is housed in Academic regulations

Addition of **Academic standing** to **Academic Regulations** requirement

Source of other unit Impact

- Regulation is housed in Academic regulations

Appendix 2: curriculum mapping

Learning Category/Aspects of Learning	Graduate Certificate in Curatorial Studies I: Introduced R: Reinforced M: Mastered	Semester 1 (Fall)	Semester 2 (Winter)		Semester 3 (Summer)	Main assessment methods
		Introduction to curatorial practice and theory (ARTH 676)	Advanced topics in curatorial practice and theory (ARTH 677)	Exhibition concept design (ARTH 678)	Curatorial project (ARTH 679)	
Critical Inquiry	1. Call into question and critically discuss historical and current trends in curatorial practice, theory, criticism, and community engagement as case studies and exemplars for	I	R	R	M	Contributing to peer discussions, reflective journal writing, reading responses, Research paper/Presentation
Critical Inquiry	2. Analyze and critique the conceptual, aesthetic, and ethical challenges of inclusive curatorial practices within a variety of institutional and non-institutional milieux.	I	R	R	M	Contributing to peer discussions, reflective journal writing, reading responses, Research paper/Presentation
Integration and Application	3. Develop a critical curatorial practice and apply their knowledge of the milieux to design an independent curatorial, public programming, educational, interpretive, evaluative, or research-based project.		I	R	M	Presentation; Completion of Exhibition Concept Design or other professional first deliverable.
Research skills	4. Research, identify, construct and evaluate arts programming that is consistent with the vision and mandate of organizations that promote decolonization efforts.	I	R	R	M	Research Paper; Group Discussions; Exhibition Concept Design; Peer Critique
Practice	5. Demonstrate an ability to realize a physical project in an advanced format that may be exhibited, installed, published, distributed, funded, enacted or activated in a reportable manner, and applying theoretical principles.	I	I	R	M	Realization of Exhibition Concept Project; Peer feedback; Experiential learning onsite
Metacognitive knowledge and lifelong learning	6. Develop strategies to define their own career objectives and understanding of the arts sector through building networks that will inform their professional goals while allowing them to practice advocacy skills on behalf of the arts they represent.	I	R	R	M	Realization of Final Exhibition Creation Project; Onsite experiential learning; Reflective journal

Appendix 3: sample syllabi

ARTH 676: Introduction to Curatorial Practice and Theory (3 credits) – sample syllabus

Prerequisite

None

Description

This seminar introduces the students to the histories and theories of curatorial practices in various local, national, and international contexts. It also explores a range of historical, social, economic, educational, ethical, legal, technological, and administrative issues concerning curation and various types of institutions. The course introduces both theoretical and historical aspects of curatorial practice from an array of perspectives, such as but not limited to Indigenous, Black, queer, feminist, and decolonial approaches, and methodologies such as cultural analysis, institutional critique, and activist interventions, to cite only a few examples. The choice of topics varies depending on the expertise of the faculty member.

Learning outcomes

By the end of the course, students will be able to:

- Discuss how the history and theories of curatorial practices affect current curatorial practices.
- Consider diverse perspectives including Indigenous, Black, queer, feminist, anti-oppression and decolonial approaches.
- Interpret diverse methodologies, including cultural analysis, critical race museology, institutional critique, and activist interventions, used in research-based curatorial practices.
- Engage in critical dialogue and contribute to current debates through thoughtful analysis and reflection, centering marginalized perspectives and challenging dominant narratives.
- Identify different professional skills including navigating donor and board relations, acquisitions, and collections as they relate to the implementation of policies and strategic plans.
- Examine the ethical considerations and responsibilities of curators in relation to representation, power, interculturality, accessibility, and cultural sensitivity.

Assessments

- Written assignments (essays, didactics, and reports)
- Projects (individual and/or group)
- Oral presentations (individual and/or group)
- Peer and self-assessments
- Participation and attendance

ARTH 677: Advanced Topics in Curatorial Practice and Theory (3 credits) – sample syllabus

Prerequisites

The following course must be completed previously: ARTH 676.

Description

This course integrates both theoretical and practical aspects of curatorial practice through a decolonized, inclusive, and sustainable lens. Curatorial engagements from an array of theoretical perspectives and methodologies such as cultural analysis, collaboration, institutional critique, performative interventions, and networked interactivity are investigated. Current debates concerning how exhibitions function as forms of research and knowledge production, as well as their ideological and social conditions are also examined. The choice of topics varies depending on the expertise of the faculty member.

Learning outcomes

By the end of the course, students will be able to:

- Critically assess key debates and contemporary issues in curatorial theory and practices.
- Analyze and critique the ways in which exhibitions contribute to knowledge generation within the field of curatorial studies, taking into account intersectional and decolonial frameworks.
- Use current trends in curatorial practice, theory, criticism, and community engagement as case studies and exemplars for contemporary practice.
- Develop a personal and well-informed perspective on the challenges and possibilities of curatorial work through a decolonized, inclusive and sustainable lens.
- Develop consultative capacities for navigating donor and board relations, acquisitions, and collections as they relate to the implementation of policies and strategic plans, amongst other skills.
- Articulate and communicate their critical insights effectively through presentations and written assignments.

Assessments

- Completion of curatorial assignments and projects
- Group critiques
- Oral presentations
- Reading and writing assignments
- Participation and attendance

ARTH 678: Exhibition Concept Design (3 credits) **– sample syllabus**

Prerequisites

The following course must be completed previously: ARTH 676. The following course must be taken concurrently or previously: ARTH 677.

Description

This course focuses on the research and planning process of a significant project that can be actualized in ARTH 679: Curatorial Project. In addition to developing practical professional skills for exhibition design, such as proposal preparation and budget management, students gain theoretical professional experience by drafting a prospectus or other first deliverable for the project and presenting this to the cohort to refine and strengthen the final work. The course takes advantage of projects, available spaces, planned cultural events or exhibitions taking place in any given year. Students become familiar with the diverse facets and various functions of a given professional environment on a theoretical level.

Learning outcomes

By the end of this course, students will be able to:

- Gain a comprehensive understanding of exhibition concept design principles, methodologies and of the diverse facets and functions within professional curatorial environments.
- Explore the roles and responsibilities of curators, exhibition designers, art handlers, educators, and other professionals involved in the exhibition process.
- Apply theoretical knowledge gained in the Curatorial Practice and Theory courses to practical curatorial contexts.
- Cultivate a professional mindset by engaging in project-based learning and developing deliverables for potential curatorial projects.
- Critically analyze and evaluate exhibition concepts through constructive peer critiques.

Assessments

- Projects (individual and/or group)
- Group critiques and case studies
- Oral presentations (individual and/or group)
- Participation and attendance

ARTH 679: Curatorial Project (3 credits)
– sample syllabus

Prerequisites

The following courses must be completed previously: ARTH 676, ARTH 677, ARTH 678.

Description

Students carry out the project researched and planned in ARTH 678, allowing them to be involved from inception to completion. The goal of this practicum is to provide students with the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work. The hands-on experience and training are enabled through the supervision of the faculty teaching the course as well as the site supervisor. During the practicum course, students gain professional experience through the realization of a significant project.

Learning outcomes

By the end of this course, students will be able to:

- Create a physical project in an advanced format based on theoretical knowledge and principles within the curatorial field.
- Apply critical analysis and decision-making skills to address challenges and refine their curatorial project in a professional context.
- Cultivate relationships with, for instance, artists, curators, and build partnerships with lenders, sponsors, and institutions to support their curatorial project, including its funding, and their professional goals.
- Assess the impact and results of their curatorial project through peer and faculty feedback, evaluation methods, and critical self-reflection.
- Reflect on the ethical and social implications of curatorial choices and engage with diverse perspectives in the exhibition process.

Assessments

- Final curatorial project realization
- Group critiques
- Reflective journal
- Peer and self-assessments
- Site and Faculty Supervisor reports



Art History Practicum Agreement Form

ARTH 679 Curatorial Project

(3 credits)

Prerequisites:

1. Students must have completed: ARTH 676, ARTH 677, ARTH 678.
2. Written permission of the Supervising Professor teaching ARTH 679

Overview of agreement and monitoring:

The undersigned Professor and host institution supervisor have agreed to supervise the undersigned student for a professional practicum as part of ARTH 679. This is an opportunity for the student to experience a professional setting and to realize a curatorial project they have developed as part of the Microprogram in Curatorial Practices in the Department of Art History. Students may find a host institution for their practicum, or the faculty member teaching ARTH 679 will organize a placement. The Curatorial Lab at Concordia may also be used for the placement of students for their practicum.

As the practicum is highly individualized, the Supervising Professor will rely on the student to report any issue in the workplace. The Supervising Professor will check in with the host institution supervisor at least once during the practicum. It is the responsibility of the student to request a meeting to update any changes made to the original offer by the host organization.

The student and the Supervising Professor of ARTH 679 will meet:

- During the approval stage of the practicum proposal.
- To approve and clarify the syllabus determined by the Supervising Professor in conjunction with the student, including the expected learning outcomes (p.3), method of evaluation (see p.4), and schedule of meetings.
- At the midterm reporting of practicum progress (this may be done by email, Zoom or in person).
- At the completion of the practicum for assessing the value of the experience.

In addition, the Supervising professor will meet with the entire cohort of ARTH 679 students at least twice (towards the beginning and end of the summer) to present and discuss their practicum.

Number of hours:

The practicum will consist of between 150-200 hours for a 3-credit course.

Name of the student: _____

Student ID #: _____

Beginning and end date of practicum: _____

Estimated number of hours per week: _____

Name of the external supervisor: _____

Position: _____

Organization: _____

Address: _____

Telephone: _____

Email: _____

Practicum Course Description and Objectives:

ARTH 679: Curatorial Project (3 credits) [practicum]

- Students **carry out** the project researched and planned in the Microprogram in Curatorial Studies, allowing them to be involved from inception to completion.
- The goal of this practicum is to provide the student the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work.
- The hands-on experience and training are enabled through the supervision of the faculty teaching the course as well as the site supervisor.
- During the practicum course, students gain professional experience through the **realization of a significant project.**

By the end of this course, students will be able to:

- Create a physical project in an advanced format based on theoretical knowledge and principles within the curatorial field.
- Apply critical analysis and decision-making skills to address challenges and refine their curatorial project.
- Cultivate relationships with artists, curators, lenders, sponsors, and institutions to support their curatorial project and professional goals.
- Assess the impact and results of their curatorial project through peer and faculty feedback, evaluation methods, and critical self-reflection.
- Reflect on the ethical and social implications of curatorial choices and engage with diverse perspectives in the exhibition process.

Note: these learning objectives may vary according to the faculty member teaching ARTH 679.

To be completed by the student in consultation with the External Supervisor.

Describe the organization and its principal activities:

Describe the principal tasks of the student (how the student's proposed curatorial project will be undertaken, duties, responsibilities):

The student agrees to work on the tasks described above under the supervision of the external supervisor and will complete a "mid-term report" questionnaire (to be signed by the external supervisor), as well as complete coursework as outlined by the faculty supervisor.

Payment:

Practicums may be paid or unpaid according to each individual practicum. Please circle if this practicum will be paid: **YES** **NO**



Final Submission and Assessments:

1. The final report:

- The complete document is required before grades can be assigned. The length of the report is a minimum of two pages.
- The final report must include the letter of assessment from the host institution Supervisor on the project realization and other practicum tasks.
- The text document must be of good quality with edits, spelling and grammar checks completed. All visual documentation must be formatted and of good quality.
- Any changes or modifications to the proposal agreement must be clearly stated in the report.
- The report must summarize:
 - a) What was gained from the experience including personal growth and technical and conceptual skills.
 - b) State the nature of the work environment including whether the involved teamwork, individual tasks or other.
 - c) Photos, screenshots, and other documentation may be submitted to show the environment and represent the completed project (with permission of the host institution Supervisor).

2. Site and Faculty Supervisor reports or letter of assessment

Assessment will include consideration of the realization of the final curatorial project planned and developed in ARTH 678. Assessment methods may vary according to the faculty member teaching ARTH 679, but may include the final curatorial project realization, group critiques, a reflective journal, peer and self-assessments, Site and Faculty Supervisor reports.

Role of the Host Organization:

The following provides general guidelines and conditions for organizations wishing to host a student. The host organization is responsible for the following:

- Review and approve the student's proposed curatorial project.
- Identify a staff person to act as the main contact for the Supervising Professor throughout the selection process and practicum and to supervise the student.
- Offer supervision to the student during the practicum: provide guidance on the work to be completed; offer feedback on their work; support successful completion of deliverables, in particular the student's project.
- Complete an assessment form regarding the quality of the work done by the student, the number of hours of the practicum and evaluating of the work done by the student, based on the expectations outlined in the job profile, the proposed curatorial project of the student and the actual outcomes.

Role of the Department of Art History:

The Department of Art History at Concordia University will provide the following in support of the student and host organization:

- The Supervising Professor (ARTH 679) will oversee and conduct the assessments.
- The Supervising Professor will assist the student in case of issues related to practicum activities to minimize the impact of errors. However, as this is a learning program, both parties must recognize that the students are still in training and that mistakes are inevitable.
- The Department of Art History and the host organization will jointly approve the scope of the practicum activities.
- As required, confidentiality of host organization information will be maintained as best as is practical. Students will be instructed prior to the practicum on how to deal with confidential information.

Information about the parties:

The Art History practicum is intended to operate as a partnership between two organizations: Concordia University and the host institution.

About the host institution:

[The host organization may provide a short statement about their work here]

Host institution contact(s):

[Please list the contact information of at least one person at the host organization responsible for supporting the intern, including full name, title, phone number, and email address]

Department of Art History contact:

Should the host organization have any concerns about the progress of the practicum, or wish to have any concerns alleviated, they may contact the following:

Graduate Programme Administrator
Department of Art History
Concordia University

Student Signature: _____

Date: _____

External Supervisor Declaration

The External Supervisor agrees that the above information is correct and will provide adequate training and feedback to the student in order for them to complete their tasks.

Signature of External Supervisor: _____

Date: _____

Signature of Graduate Program Director: _____

Date: _____

Signature of Department Chair: _____

Date: _____





February 12, 2024

To: Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dr. Potvin,

I write to endorse the development of a Graduate Certificate in Curatorial Studies and Practices, and a Microprogram in Curatorial Studies at Concordia University.

In my capacity as Deputy Director at the Musée d'art contemporain de Montréal (MAC), I recognize the importance of integrating rigorous curatorial scholarship with practice. The MAC is undergoing a major transformation project to meet the urgent call for cultural institutions to innovate and assume a more socially responsive role. We are deeply invested in practices that champion inclusivity, community engagement, and tangible steps towards decolonization. Consequently, there is a pressing need for curatorial professionals who are proficient in driving dialogues and actions within this context.

My roles as Director and Curator at Concordia's FOFA Gallery (2014-2019) and as Director at Concordia's Office of Community Engagement (2019-2020) have provided me with firsthand insight into the Faculty of Fine Arts' commitment to experiential learning. This commitment to practical experience is what propels graduates into meaningful careers in the museum and wider cultural sectors.

I see the following as key strengths of the proposed programs:

- The flexibility for students to choose the pathway of study – graduate certificate or microprogram – that best addresses their profile and needs.
- The focus on sustainable and decolonized practices; areas that are omitted from many other similar programs.
- The way the admissions requirements open up opportunities for non-traditional learners, i.e. by recognizing previous lived experiences.
- The highly practical nature of the internship during which students have the opportunity to apply the skills they have developed during the program.
- The inclusion of an elective course that allows students to incorporate an area of their own interest.



- Concordia's Department of Art History as a uniquely valuable site in terms of its facilities (Curatorial Lab, FOFA Gallery, etc.) and its relationships with art institutions in Quebec.

I welcome the opportunity to discuss how the MAC might collaborate with the Department of Art History to advance our shared objectives.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Jennifer Dorner, Deputy Director
Musée d'art contemporain de Montréal
Cell : 514-441-6171
Email : jennifer.dorner@macm.org

February 19, 2024

Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Subject: Letter of support for the Graduate Certificate in Curatorial Studies and Practices and Microprogram in Curatorial Studies at Concordia University.

Dear Dr. Potvin,

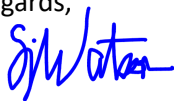
La Guilde and Concordia University's Department of Art History share a commitment to supporting research and exhibitions devoted to contemporary craft and Indigenous art practices in Canada. La Guilde is situated in proximity to Concordia University and offers a number of job training and mentorship opportunities for students in the areas of exhibition development, contemporary art research, and permanent collection conservation. La Guilde commits to becoming a community partner for the certificate and microprogram.

Given our shared interest in expanding the presentation of Indigenous artists' work, La Guilde would equally support and engage with the program focus on sustainable and decolonized practices; areas that are not a feature in other programs and necessary to the local and national educational context. La Guilde mentors and trains undergraduate and graduate students throughout the year in best practices for art presentation and artist support. As such, we are deeply interested in the highly practical nature of the internship aspect of this program and have numerous experiential learning opportunities for students and graduates of the new programs.

We would be very happy to discuss the possibility to offer internship opportunities to practicum students within our institution.

Please do not hesitate to contact me if you have any questions.

Kind regards,



Sarah Watson

Executive Director
direction@laguilde.com

To: Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dr. Potvin,

On behalf of the Musée d'art contemporain de Baie-Saint-Paul, I am writing this letter to express my support for the development of a Graduate Certificate in Curatorial Studies and Practices, and a Microprogram in Curatorial Studies at Concordia University.

I offer workshops on the art market and how to establish the value of a work of art with the ArtVolt program since its foundation. I am always amazed by the innovative approach that enables students and alumni to learn a great diversity of skills needed to navigate the complexities of the art world. It is distinctly built around practical aspects that are key to the development of their artistic careers. In my opinion, it could play an essential role for young art historians and really support their growth as professionals.


I see the following as key strengths of the proposed programs:

- The flexibility for students to choose the pathway of study – graduate certificate or microprogram – that best addresses their profile and needs.
- The focus on sustainable and decolonized practices; areas that are omitted from many other similar programs.
- The way the admissions requirements open up opportunities for non-traditional learners, i.e. by recognizing previous lived experiences.
- The highly practical nature of the internship during which students have the opportunity to apply the skills they have developed during the program.
- The inclusion of an elective course that allows students to incorporate an area of their own interest.
- Concordia's Department of Art History as a uniquely valuable site in terms of its facilities (Curatorial Lab, FOFA Gallery, etc.) and its relationships with art institutions in Quebec.

We would be very happy to discuss with your team the possibility to offer internship opportunities to practicum students within our institution.

Please do not hesitate to contact me if you have any questions.

Regards,



Gabrielle Bouchard
Director and chief curator
Musée d'art contemporain de Baie-Saint-Paul



Centre des arts visuels
Visual Arts Centre

350 avenue Victoria
Montréal (Québec) H3Z 2N4

514-488-9558 info@centredesartsvisuels.ca
www.centredesartsvisuels.ca

Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

January 26, 2024

Dear Dr. Potvin,

On behalf of the McClure Gallery and The Visual Arts Centre, I am writing this letter to express my support for the development of a Graduate Certificate in Curatorial Studies and Practices, and a Microprogram in Curatorial Studies at Concordia University.

I am currently an Affiliate Assistant Professor in the Department of Art History, as well as a former student (MA, 2010, BFA, 2008). Given my experience with the Department, I see the following as key strengths of the proposed programs.

First, I see a tremendous benefit for students to apply practically their research undertaken in the Art History Department, with its focus on sustainable and decolonized practices; areas that are omitted from many other similar programs. As a student, this was one of the key reasons I chose Concordia and I'm happy to see the new ways in which the Department is furthering the commitment to hands-on application through practical internships and skill building. I also see benefits for students within the structure of the program, namely, the flexibility for students to choose the pathway of study – graduate certificate or microprogram – that best addresses their profile and needs. Finally, as a student who worked full time throughout my degrees, I appreciate the way these programs align the admissions requirements and open up opportunities for non-traditional learners, i.e. by recognizing previous lived experiences.

We would be very happy to discuss with your team the possibility to offer internship opportunities to practicum students within our institution. Please do not hesitate to contact me if you have any questions.

Regards,


Amber Berson, PhD
Executive Director
Centre des arts visuels | Galerie McClure

PIERRE-FRANÇOIS OUELLETTE ART CONTEMPORAIN

www.pfoac.com

963 Rachel est, Montréal

 PFOAC

 @galeriepfoac

Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dr. Potvin,

I am writing this letter to express my support for the development of a Graduate Certificate in Curatorial Studies and Practices, and a Microprogram in Curatorial Studies at Concordia University.

Created in 2001, Pierre-François Ouellette art contemporain in Montreal has worked closely with faculty members, students and alumni from Concordia University. We represent three artists with strong links with Concordia's Department of Art History, August Klintberg (formerly known as Mark Clintberg, PhD 2013 Concordia) currently Associate Professor in the School of Critical and Creative Studies at the Alberta University of the Arts, John Latour (M.A. Art History Concordia) currently Teaching & Research Librarian - Fine Arts and Adad Hannah (Doctor of Philosophy (Ph.D.) Art History and Fine Arts. 2013). We have help Professor Tracy Valcourt with comments about her planned course last semester, ARTH 387: Issues in Art and Criticism: Spaces of Critique: Museums, Social Media, Magazines.

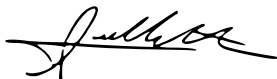
I see the following as key strengths of the proposed programs:

- The flexibility for students to choose the pathway of study – graduate certificate or microprogram – that best addresses their profile and needs.
- The focus on sustainable and decolonized practices; areas that are omitted from many other similar programs.
- The way the admissions requirements open up opportunities for non-traditional learners, i.e. by recognizing previous lived experiences.
- The highly practical nature of the internship during which students have the opportunity to apply the skills they have developed during the program.
- The inclusion of an elective course that allows students to incorporate an area of their own interest.
- Concordia's Department of Art History as a uniquely valuable site in terms of its facilities (Curatorial Lab, FOFA Gallery, etc.) and its relationships with art institutions in Quebec.

We would be very happy to discuss with your team the possibility of offering internship opportunities to practicum students within our institution.

Please do not hesitate to contact me if you have any questions.

With best regards,



Pierre-François Ouellette

: Director

daphne

To: Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

daphne
103, 5425 av Casgrain,
Tiohtià:ke / Montreal, QC H2T 1X6

Dear Dr. Potvin,

On behalf of daphne (Centre dart daphne), Tiohtià:ke's first Indigenous-determined artist-run centre, I am writing this letter to express my support for the development of a Graduate Certificate in Curatorial Studies and Practices, and a Microprogram in Curatorial Studies at Concordia University.

My previous relationship with Concordia's Department of Art History at both the undergraduate and graduate levels was an enriching experience. I fondly remember Professor Sandra Paikowsky setting assignments that opened a space for us to curate imagined (in my case feminist) art exhibitions. While it was only after I was in the process of a doctorate in Art Education I began my curatorial work. This step into curation, came out of the world that I had created around myself from my undergrad days and the accompanying experiences of museums, galleries and artist-run centres.

My on-going work in artist-run centres over time, and now at daphne has furthered my knowledge of curating as well as the day-to-day workings of an arts administrator. Even more importantly, this work has made me recognize the importance of training the next generation of cultural workers.

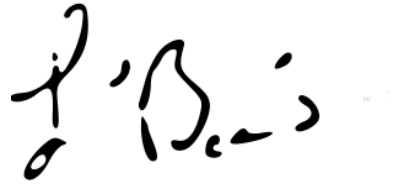
I see the following as key strengths of the proposed programs:

- The flexibility for students to choose the pathway of study – graduate certificate or microprogram – that best addresses their profile and needs.
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- The way the admissions requirements open up opportunities for non-traditional learners, i.e. by recognizing previous lived experiences.
- The highly practical nature of the internship during which students have the opportunity to apply the skills they have developed during the program.
- The inclusion of an elective course that allows students to incorporate an area of their own interest.
- Concordia's Department of Art History as a uniquely valuable site in terms of its facilities (Curatorial Lab, FOFA Gallery, etc.) and its relationships with art institutions in Quebec.

We would be very happy to discuss with your team the possibility of offering internship opportunities to Indigenous practicum students at daphne.

Please do not hesitate to contact me if you have any questions.

Best Regards,

A handwritten signature in black ink, appearing to read "Lori Beavis". The signature is fluid and cursive, with the first name "Lori" written in a larger, more prominent script than the last name "Beavis".

Lori Beavis,
daphne, Executive Director



Montréal, le 1er février 2024

Monsieur John Potvin Ph.D.
Directeur du département d'histoire de l'art
Université Concordia
1515, rue Sainte-Catherine Ouest
Montréal (Québec) H3H 1M8

Objet : Lettre d'appui pour la création d'un diplôme de deuxième cycle en études et pratiques curatoriales (Curatorial Studies and Practices)

Cher Monsieur Potvin,

C'est avec un grand intérêt que je vous sou mets cette lettre d'appui pour la création d'un programme de deuxième cycle en études et pratiques curatoriales au sein de votre département. Depuis 2021, je suis responsable de la Collection Loto-Québec, emploi qui m'amène à travailler en étroite collaboration avec des artistes et à réaliser des expositions.

Mon profil de carrière est davantage celui d'une muséologue. Au fil des ans, j'ai côtoyé des historiens de l'art, des conservateurs ainsi que des commissaires avec lesquels j'ai conçu divers projets. Je suis d'avis que la mise sur pied d'un tel programme me permettrait d'être mieux outillée pour analyser des œuvres en art actuel et contemporaines et pour faciliter ma compréhension de leur contexte de création et ce, sans avoir à compléter à nouveau un diplôme de premier cycle.

L'avantage d'un tel programme est d'offrir aux professionnels, occupant un emploi régulier, la possibilité de se perfectionner tout en profitant d'une flexibilité qui allie le travail et les études. Par ailleurs, il s'agit d'une occasion permettant la rencontre et les échanges entre les travailleurs, les chercheurs et les étudiants du milieu artistique et culturel pour mieux comprendre les enjeux entourant la décolonisation des pratiques de conservation et pour favoriser l'inclusion.

À cet effet, Loto-Québec songe éventuellement à diversifier sa Collection et à l'enrichir de nouvelles acquisitions afin qu'elle reflète mieux les pratiques et l'ensemble de la création artistique québécoise



d'aujourd'hui. Votre programme serait donc bénéfique d'un point de vue personnel et professionnel mais également pour mon employeur.

Souhaitant que ma lettre trouve écho au sein de votre département.

Cordialement,

A handwritten signature in black ink, appearing to read "Manon Pouliot".

Manon Pouliot
Conseillère en projets culturels et en partenariats
Collection Loto-Québec



FOFA Gallery
Concordia University
EV 1.715, 1515 Ste-Catherine W
Montreal, QC H3G 2W1

April 4, 2022

Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8
John.potvin@concordia.ca

Dear Dr. Potvin

On behalf of the FOFA Gallery, I am writing this letter to express my enthusiastic support for the development of a Graduate Certificate in Curatorial Studies and Practices at Concordia University. A space dedicated to innovation, FOFA Gallery fosters and facilitates pedagogical inquiries, curatorial experiments, cutting-edge artistic practices and training opportunities. I believe that the plan to offer a certificate in Curatorial Studies and Practices is a timely and innovative initiative, and one that will surely contribute to the evolving dialogues around curatorial practice today.

Through FOFA Gallery's mandate to support the work of Concordia Faculty of Fine Arts students, faculty, staff and alum, I have had the chance to work with a range of practitioners connected to the University. It is clear that there is consistent interest on the part of artists, staff, interns, and visitors to explore curatorial practice and methodologies, as well as increasing demand for hands-on practical training in this field. I have often found that my background in curatorial work both in museums and as an independent curator has been a valuable asset in the mentorship and learning that happens at the Gallery. I foresee great potential for the Gallery to expand its teaching/training in this area and would welcome the opportunity to develop additional opportunities for student learning here.

As an alum of Concordia's Art History program (MA 2011), I can also personally attest to the suitability of Concordia University to host a program of this nature. During my studies, I was not only exposed to rigorous critical dialogue on curatorial practice and writing through some of my coursework, but also had the opportunity to immerse myself in Montreal's vibrant art scene. Through this, I was able to benefit from exposure to an extended and diverse network of museums, artist-run spaces, and galleries, as well as career opportunities that further shaped the evolution of my practice. I can imagine that a program focused on professional development, skills training, and experiential learning opportunities,

such as the one being proposed, would offer an excellent springboard for those wishing to pursue work in the cultural sector – here and across Canada.

Please do not hesitate to contact me if there are any questions about the FOFA Gallery and our wholehearted support for this initiative.

Sincerely,

A handwritten signature in black ink, appearing to read 'Nicole Burisch', with a stylized, cursive script.

Nicole Burisch
Director, FOFA Gallery
nicole.burisch@concordia.ca

FONDERIE DARLING
745, RUE OTTAWA,
MONTREAL (
QUEBEC) CANADA
H3C 1R8 T
514.
392.1554

FONDERIEDARLING.ORG

Montreal, August 11th, 2022

Dr. John Potvin
Department Chair, Art History
Concordia University
1515 St. Catherine Street W.
Montreal, QC H3H 1M8

Dr. John Potvin,

I am writing this letter to extend my support for the proposed Curatorial Certificate at Concordia University. As a long-time curator, founder and artistic director of visual-arts venue Fonderie Darling, I testify to the essential role curators play in supporting the creation, production, and dissemination of contemporary art by linking emergent artistic practice to the broader public.

The role of cultural institutions is constantly adapting in response to relevant critical social issues put forth through contemporary artistic practice. With the assertion of new theories and values come new modes of curating, and the role of the curator increasingly adopts a wider and wider range of practices. The diversity of the proposed Curatorial Certificate is a powerful reflection of the field itself, and this access to a broad range of relevant knowledge will have a critically positive impact on the next generation of curators.

Bridging the gap between theoretical scholarship and experiential knowledge, a Curatorial Certificate program will equip students with the practical strategies necessary to shape artistic discourses as they relate to their own communities. The program would also be an invaluable means of enriching their professional networks, and in turn generate new cooperative relationships between artists, cultural institutions, and broader publics, in which they will serve as the necessary link.

Concordia University's Faculty of Fine Arts holds the resources, professors, and networks to generate a lively and extensive Curatorial Certificate, and I strongly believe that the creation of such a program would advance both curatorial and critical practices within the arts.



Kind Regards,

Caroline Andrieux
Fondatrice et directrice artistique

31 March 2022

Dr. John Potvin,
Chair, Department of Art History
Concordia University, EV.3.809
1455 de Maisonneuve Blvd. W.,
Montreal, Quebec, H3G 1M8

Re: Endorsement for new Graduate Certificate in Curatorial Studies and Practices

Dear Dr. Potvin,

I am writing to express my support for the new Concordia University Graduate Certificate in Curatorial Studies and Practices. For students interested in pursuing careers as curators and cultural workers, being fluent in art history and theory simply does not suffice. Curating is a practice that requires an ability to simultaneously navigate complex cultural, economic, personal, and political relationships. The new Graduate Certificate will be essential in helping students bridge the gap between their knowledge of contemporary art and the environment in which it exists.

From both personal and professional experience, I can attest to the need for a program in Curatorial Studies and Practices that exists in Montreal. While completing my BFA in Art History at Concordia University, I was fortunate to be a member of the Institute for Co-operative Education. As a co-op student I benefited from experiential learning that taught me the real-life applications and limitations of my academic training. While interning at SBC Gallery of Contemporary Art, I worked closely with the then Director/Curator Pip Day. Being able to take a curatorial project from conception to creation with an experienced curator was an educational experience like no other. I can think of no better way to learn the true artistic and community stakes of curatorial practice.

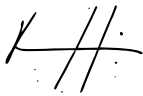
Not only a training opportunity, these internships were also how I began to build a professional network that continues to support my career. I was eventually hired at SBC Gallery before moving to Toronto to pursue a MFA in Criticism & Curatorial Practice at OCAD University. While in Toronto, my connections at SBC Gallery facilitated my employment at Gallery TPW where I worked during my studies. I was able to accumulate significant professional experience by the time I completed my MFA and was hired at La Centrale galerie Powerhouse shortly after graduating. I credit my smooth transition into full-time employment with the professional experience and network I gained as a co-op student.

Today, La Centrale regularly receives internship requests from students and recent graduates specifically seeking experience in the programming and curatorial side of our operations. In the last years the chasm between Canada's cultural institutions and the publics they are meant to serve has become increasingly clear. In order to keep these institutions relevant, we need practitioners who can not only envision new models of curatorial practice, but have the tools and training to make these new configurations possible. It is a challenging time for cultural institutions and we understand the need to properly train emerging scholars and cultural organizers. With the support of community partners like La Centrale, I am hopeful that the Graduate Certificate in Curatorial Studies and Practices will help this new generation rise to the occasion.

In addition to being a timely and necessary contribution to the Montreal and Canadian arts sector, I am confident that the new program's leadership will make it truly exceptional. As a student at Concordia I knew Professor Jim as a Professor and as Research Chair in Ethnocultural Art Histories. As a cultural worker, I know Professor Jim as an active and respected member of Montreal's arts community. The community support and professional network that Professor Jim brings with her will make it possible to turn academic discussions into experiential learning opportunities. The program's potential to turn theory into practice will also turn students into professionals.

It is with great excitement and optimism that I support the Graduate Certificate in Curatorial Studies and Practices, thank you for taking the time to consider my endorsement. I look forward to the possibility of working with the next generation of curators and cultural workers shaped by the new program.

Sincerely,



Mattia Zylak

General Co-Director & Operations, La Centrale galerie Powerhouse
MFA Criticism & Curatorial Practice, OCAD University '20
BFA Art History, Concordia University '18



From:
Michèle Thériault
Director
Leonard & Bina Ellen Art Gallery
Concordia University

To: John Potvin
Department Chair, Art History
Faculty of Fine Arts

Letter in support of the planned Graduate Certificate in Curatorial Studies and Practices

I am happy to see that Concordia is instituting a graduate program in curatorial studies and I support its creation. I remember being involved in discussions with faculty 10 years ago to set up a masters in the same field and later being invited at UQAM to reflect with others on the possibility of creating a curatorial studies degree there also. It is thus a welcome addition to the cultural field as articulated by the Faculty of Fine Arts. The Ellen Gallery has been at the forefront of the discourse on critical curatorial thinking in Montreal for many years now through its experimental exhibition formats and display strategies, public programming, critical texts, and digital archival fonds. It is thus welcome news that the Faculty of Fines Arts is planning this new program. I think that the gallery will be an asset that will enhance this new program and will be a significant resource for students (as well as an attraction point for recruitment), faculty and guests that will be invited to teach in this certificate. We are thus thrilled that we can be part of this new disciplinary adventure and fully support its coming into being.

Cordially,

Michèle Thériault
General and Artistic Director
michele.theriault@concordia.ca

Montréal, le 20 avril 2022

Dr. John Potvin, président
Université Concordia
Département d'histoire de l'art, EV.3.777
1455, boul. de Maisonneuve O.,
Montréal, Québec, Canada, H3G 1M8

Bonjour,

C'est avec beaucoup d'enthousiasme que j'appuie les démarches du Département d'histoire de l'art de l'Université Concordia à mettre sur pied un certificat d'études supérieures en études et pratiques curatoriales. En tant que chef des expositions et des publications au Musée d'art contemporain de Montréal, où je gère une équipe de conservateurs, de chargées de projets, d'un éditeur et d'un responsable d'action culturelle, je peux témoigner de l'importance d'avoir un tel programme pour les étudiant.e.s qui souhaitent faire carrière au sein du milieu de l'art contemporain.

Les programmes en études et pratiques curatoriales existent depuis des décennies à travers le monde et ont contribué de façon significative à élargir et faire évoluer nos façons de réfléchir le rôle du musée au 21^e siècle, l'exposition comme lieu de recherche et de production de savoir, de dialogue et d'échange avec divers publics. Le rôle du commissaire est devenu par le fait même plus complexe, mais aussi plus important et fascinant.

Il y a un manque flagrant au Québec pour ce type de programme qui viendrait compléter les programmes en histoire de l'art, en muséologie, en culture visuelle et matérielle, et en pratique des arts existants. Des programmes similaires existent à travers le pays, et ce depuis longtemps, et ils ont servi à former des générations de commissaires indépendants, et de conservateurs de musées, galeries et centres d'art. Ces programmes ont tout particulièrement facilité la formation de commissaires autochtones et de la diversité.

Le contexte montréalais est unique en raison de son bilinguisme, de ses quatre universités qui offrent des programmes en histoire et en pratique des arts et du dynamisme du milieu de l'art contemporain ; notre ville est donc un point d'encrage parfait pour former nos commissaires du futur, mais aussi pour forger des échanges et des dialogues nationaux et internationaux à partir d'ici.

Le Musée d'art contemporain de Montréal, le plus vieux et plus important musée d'art contemporain au Canada accueille régulièrement des stagiaires en histoire de l'art et en muséologie, tant des universités montréalaises que de l'étranger, et un pourcentage significatif souhaite œuvrer au sein des départements de la conservation et l'éducation, et plus particulièrement en tant que conservateurs d'expositions. Actuellement les étudiant.e.s qui veulent poursuivre leur formation en études curatoriales doivent quitter Montréal, et malheureusement,

plusieurs ne reviennent pas. La proposition de forme hybride, qui faciliterait la formation d'étudiant.e.s à distance, permettrait aussi de créer des échanges et des dialogues qui sont si essentiels à notre profession.

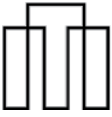
La Faculté des beaux-arts de Concordia est l'une des écoles d'art, de performance et de design les plus complètes au pays. Elle a un large soutien communautaire, des réseaux professionnels et des contacts internationaux nécessaires pour créer un programme des plus dynamiques. L'expertise pratique, théorique, scientifique et communautaire des membres du corps professoral du Département d'histoire de l'art est vaste. Elle couvre des domaines d'intérêt stratégique étroitement liés au projet de certificat : diversité, inclusion, modes de connaissance autochtones, pratique sociale, engagement communautaire, activation des archives, précédents historiques, critique institutionnelle, programmes éducatifs inclusifs, analyse de la culture matérielle, production et diffusion médiatiques, design d'expositions et de structures interprétatives et plus encore.

En conclusion, j'appuie très fortement la création de ce programme d'études et pratiques curatoriales, et, je crois fermement que la Faculté de beaux-arts de Concordia est l'institution idéale pour le faire.

Très sincèrement,

A handwritten signature in black ink, appearing to read 'Lesley Johnstone', written in a cursive style.

Lesley Johnstone
Chef des expositions et des publications
Musée d'art contemporain de Montréal
Lesley.johnstone@macm.org



Dr. John Potvin, président
Université Concordia
Département d'histoire de l'art, EV.3.777
1455, boul. de Maisonneuve O.,
Montréal, Québec, Canada, H3G 1M8

Objet : Lettre de soutien pour un certificat d'études supérieures en études et pratiques curatoriales à l'Université Concordia

Dr. John Potvin,

À titre de conservatrice des collections du Musée d'art de Joliette, j'appuie sans hésitation l'initiative d'implanter un certificat d'études supérieures en études et pratiques curatoriales au sein de l'Université Concordia.

Au tournant du 21^e siècle, au moment d'amorcer mes études de premier cycle en histoire de l'art, l'unique ville où il était possible d'obtenir une formation en études curatoriales était Toronto. Ce domaine professionnel, qui a pris énormément d'ampleur depuis les années 1990, est devenu aujourd'hui une dimension fondamentale de la carrière de l'historien-ne de l'art, ayant même supplantée l'autorité du critique d'art. Le rôle du commissaire est sans aucun doute la voie la plus prisée dans le domaine de l'histoire de l'art et ce tournant s'observe auprès des jeunes étudiant-e-s. Depuis 20 ans, quelques universités à travers le pays ont embrassé cette direction et l'Université Concordia devrait définitivement en faire de même. Elle serait d'ailleurs la seule institution anglophone à offrir un tel programme à Montréal.

En m'appuyant sur ma propre expérience professionnelle dans le milieu de la diffusion de l'art dans les centres d'artistes et les Musées d'ici, j'ai constaté que les jeunes en cours de formation ou diplômé-e-s en histoire de l'art expriment un vif intérêt pour le commissariat d'exposition. Au département des collections du Musée d'art de Joliette, la plupart des stagiaires que nous accueillons manifestent le désir d'en apprendre davantage sur l'organisation d'expositions même si leur stage concerne davantage la recherche dans le sillon des récentes acquisitions. Cela démontre à quel point les étudiant-e-s souhaitent ajouter à leur parcours des expériences valides et concrètes dans ce champ d'expertise.

Offrir des cours de commissariat est une nécessité pour refléter l'évolution de l'intérêt des chercheur-e-s, mais aussi des étudiant-e-s qui s'efforcent plus souvent qu'autrement d'acquérir une expérience en organisation d'expositions par le biais d'initiatives moins officielles et souvent en parallèle à leur cheminement académique. Un tel certificat pourrait contribuer à offrir aux étudiant-e-s des outils

et des connaissances pointues en la matière, à améliorer le niveau des projets d'exposition commissariés et à favoriser leur chance de succès sur le plan professionnel.

Parallèlement à mon emploi au Musée de Joliette, je suis doctorante au Département d'histoire de l'art de Concordia sous la supervision de la professeure Alice Ming Wai Jim. Ma thèse s'inscrit dans le domaine des études sur les expositions et focalise sur les expositions nationales en art contemporain et tout particulièrement sur celles de l'Inde. Le nouveau champ de recherche historique en études des expositions témoigne de l'importance grandissante accordée aux expositions et au rôle du commissaire depuis les dernières décennies à l'échelle planétaire.

Je suis fière de dire haut et fort que l'Université Concordia est à l'avant-garde de la production artistique au Canada, que ce soit du point de vue théorique ou pratique. Au cours des dernières années, le Département d'histoire de l'art a travaillé à accroître l'inclusion en s'assurant d'élargir l'expertise et la provenance culturelle de ses professeur-e-s. Cette situation audacieuse, qui est tout à son avantage, pourrait facilement être mise à profit dans ce programme d'études supérieures. Avec son corps professoral au profil tant historique que contemporain, le département a donc déjà tout en main pour jouer un rôle énorme dans ce domaine très dynamique.

Dans l'espoir que ce nouveau tournant soit entrepris par le département afin de remédier à cette lacune dans le cursus universitaire et d'être le reflet de l'évolution du monde de l'art actuel, je vous transmets mes vœux les plus sincères.

Cordialement,



Julie Alary Lavallée

Conservatrice des collections du Musée d'art de Joliette et
Doctorante en Philosophie au Département d'histoire de l'Art de l'Université
Concordia



John Potvin

Directeur

Département d'histoire de l'art

Université Concordia, Montréal

Objet: Lettre d'intérêt pour le programme en commissariat

Cher M. Potvin,

Le Musée Colby-Curtis accueille avec enthousiasme la volonté du département d'histoire de l'art de l'Université Concordia de créer un programme court en commissariat. Le Musée est toujours à la recherche de jeunes talents pour apporter un soutien à son programme d'expositions et il se fera un plaisir d'offrir des opportunités de stages aux étudiants et diplômés de votre programme.

Merci de me tenir au courant des développements de cette initiative!

Salutations cordiales,

Samuel Gaudreau-Lalande

Directeur-conservateur

Musée Colby-Curtis, Stanstead

Montréal, le 31 mars 2022

Prof. Alice Ming Wai Jim
Concordia University Research Chair in Ethnocultural Art Histories
1455 de Maisonneuve Blvd. W.,
Montreal (Quebec) H3G 1M8

Objet : Lettre de soutien au développement d'un certificat d'études supérieures en études et pratiques curatoriales au département d'histoire de l'art de l'Université Concordia.

Professeure Alice Ming Wai Jim,

Je vous écris pour signifier l'intérêt et le soutien du centre d'artistes OBORO dans le développement d'un certificat d'études supérieures en études et pratiques curatoriales au département d'histoire de l'art de l'Université Concordia.

L'approche proposée par le département de l'histoire de l'art de l'Université Concordia correspond tout-à-fait aux enjeux que vivent les organisations artistiques et muséologiques comme la nôtre, et plus largement la société. Les axes stratégiques orientant la prestation du certificat : la diversité, l'inclusion, les modes de connaissance indigènes, la pratique sociale, etc., sont essentiels à la compréhension du contexte professionnel où exerceront ces futur.e.s travailleur.euse.s culturel.le.s.

Après une vaste professionnalisation du milieu culturel dans les dernières décennies, il est essentiel que les pratiques curatoriales ouvrent leur porte à une pluralité de parcours qui enrichiront les réflexions et les manières de faire. Le milieu culturel fait face à de nombreux défis et il est primordial que les travailleur.euse.s de demain reçoivent une solide formation qui leur permettront d'innover et d'apporter de nouveaux regards et de nouvelles pratiques. La structure proposée par le certificat, visant à développer le développement professionnel, l'acquisition de compétences et les possibilités d'apprentissage par l'expérience tout en permettant un parcours personnalisé et en accueillant un public varié, nous semble offrir une excellente approche.

Nous espérons que ce certificat verra le jour. Veuillez recevoir, Professeure Jim, mes salutations sincères.



Marianne Breton (elle/she)
Directrice générale

OBORO
4001, rue Berri, porte 301
Montréal (Québec) H2L 4H2



**GRADUATE CERTIFICATE IN
CURATORIAL STUDIES AND PRACTICES**

MARKET ANALYSIS REPORT

JUNE 2023



INTRODUCTION

The present report details the job profile, required skills, past employment trends and projected employment prospects for curators. It is divided into three sections:

- Employment outlook in Canada
- Employment outlook in the US
- Job posting in Canada (2018-2023)

The data has been gathered from the Government of Canada labour resources and the US Bureau of Labor Statistics.¹ The job posting analytics section is a report produced by Lightcast, which collects information from job postings published online across the country. Since curation is a specialized field and not all job opportunities are listed online, the data may not entirely represent the curatorial job market. This is particularly true for Quebec since Lightcast does not collect data from job postings published in French. However, the data has been included to provide an overview of the online curatorial job market in Canada.

KEY FINDINGS

- Curation is a growing employment field in North America with a moderate to good growth rate projected in Canada over the next 3 and 10 years, and a 14 percent overall growth projected in the US.
- In Canada, the media salary for a curator-director is \$47.69 per hour while the median salary for a curator is \$21.75. In the US the median salary for curators is \$60,110 per year.
- Based on the 312 curator job postings published online in the past 5 years, the top job titles are museum curator, curator, art curator and gallery curator.
- The 312 job postings correspond to 127 different employers out of which colleges, universities and professional schools are the main employers. The median salary advertised is \$54,900 per year.
- The main general skills advertised in job postings are research, collections, writing, planning and management. The main specialized skills are curation, exhibitions, art history, museum studies and fundraising.
- Most of the job opportunities for curators posted online are in Ontario (Toronto) and BC (Vancouver and Burnaby).

¹ The Government of Canada labour resources include the [National Occupation Classification \(NOC\)](#) system, the [Canadian Occupation Projection System \(COPS\)](#) and [Opportunext](#). The US Bureau of Labor Statistics resources include the [Occupational Outlook Handbook](#) and the [Quarterly Census of Employment and Wages](#).

EMPLOYMENT OUTLOOK IN CANADA

The Government of Canada’s NOC system places **Curator** as part of the group “Conservators and curators” (NOC 51101) and **Curator-director** as part of the group “Library, archive, museum and art gallery managers” (NOC 50010). The expertise and skills sought by employers overlap for both groups while job prospects for curator-director positions are slightly more favourable than those for curators.

Curator job profile

The following is a [curator job profile](#) created by the Government of Canada Job Bank based on current and past job postings.

CURATOR IN CANADA

Job duties

People working in this occupation usually apply the following skill set.

- Recommend the acquisition of paintings, photographs, sculptures, documents and other museum and art gallery artifacts
- Conduct research into objects' methods of construction techniques, structure and materials to understand its physical and chemical makeup
- Develop storylines and themes and organize displays and exhibitions
- Coordinate the storage of collections and the setting up of displays and exhibitions
- Oversee the conservation, display and circulation of collections
- Supervise curatorial assistants and other museum technicians.

Employment requirements

- Curators require a master's or bachelor's degree in museology, art history or a field related to their specific area of work.

Employment prospects

Government of Canada Job Bank

3-year growth prospects for curators and curator-directors

Quebec, Alberta

Ontario, Manitoba

Good (4 out of 5)

Moderate (3 out of 5)

Opportunext

5-year growth prospects for curator-director (Canada)
 10-year growth prospects for curator-director (Canada)

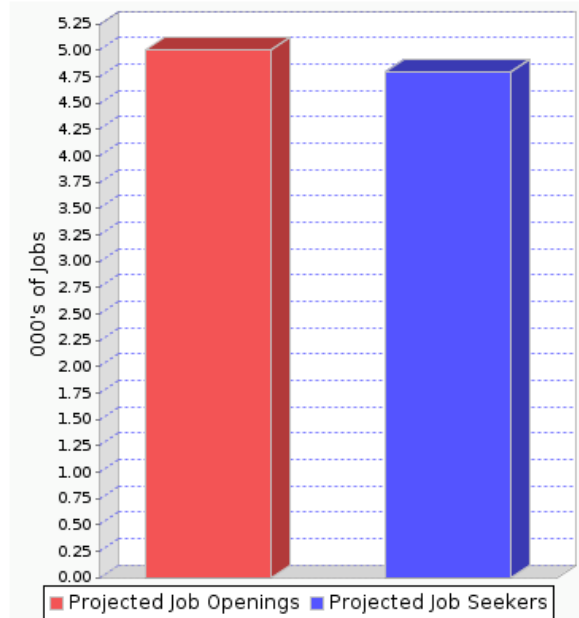
Good
 Excellent

Canadian Occupation Projection System (COPS)

COPS places curators as part of the larger group of librarians, archivists, conservators and curators. Below is the projected growth and projected number of positions for the period of 2022 to 2031.

“The number of job openings (arising from expansion demand and replacement demand) (...) are expected to total **5,000**, while the number of job seekers (arising from school leavers, immigration and mobility) is expected to total **4,800**.

(...) The balance between labour supply and demand seen in recent years is expected to continue over the projection period.”



Source: Occupational Projection Summary for Librarians, archivists, conservators and curators (2022-2031)

In terms of positions, COPS projects the following numbers:

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
16900	17300	18100	18000	18000	18000	18000	18000	18000	18100	18200

Remuneration

The Government of Canada Job Bank provides wage ranges based on available national, provincial, territorial, and economic region level data as well as official surveys. The following ranges were published in November 2022.

Curator-director

	Low (\$/hour)	Median (\$/hour)	High (\$/hour)
Canada	29.12	47.69	67.31
Quebec	38.72	43.96	79.67

Curator

	Low (\$/hour)	Median (\$/hour)	High (\$/hour)
Canada	14.5	21.75	38.54
Quebec	15.25	24.00	38.36

EMPLOYMENT OUTLOOK IN THE US

Curator job profile

Job duties

The [US Bureau of Labor Statistics](#) includes curators as part of the group “Archivists, curators and museum workers” and differentiates **curators** from **museum directors**. Job duties for both profiles include:

- Lead the acquisition, storage, and exhibition of collections
- Negotiate and authorize the purchase, sale, exchange, and loan of collections
- Research, authenticate, evaluate, and categorize the items in a collection
- Perform administrative tasks and help manage their institution’s research projects
- Represent institution in the media, at public events, and at professional conferences

Employment requirements

“Curators typically need a master’s degree in art history, history, archaeology, or museum studies. In small museums, curator positions may be available to applicants with a bachelor’s degree. Because curators have administrative and managerial responsibilities, courses in business administration, public relations, marketing, and fundraising are recommended.”

Employment prospects

+14% overall growth

According to the US Bureau of Labor Statistics, overall employment for curators is projected to grow 14 percent from 2021 to 2031, which represents 1,900 new jobs. This is higher than the 12 percent growth projected for the group of archivists, curators, and museum workers together and much higher than the average for all occupations.

A large portion of those openings are expected to result from the need to replace workers who transfer to different occupations or exit the labour force for retirement or other reasons.

In 2021, there was a total of 12,900 curator jobs in the US.

In geographical terms, most job opportunities for curators are in New York, California and Texas, with 1,660, 1,050 and 570 jobs, respectively, in May 2021. These locations are followed by North Carolina and Illinois. Detailed maps on job distribution for curators across the US can be found [here](#).

Remuneration

The median annual wage for curators in May 2021 was **\$60,110**. For archivists, curators, and museum workers as a group, the median annual wage in the top industries in which they worked were as follows:

Educational services; state, local, and private	\$60,550
Government	\$53,210
Museums, historical sites, and similar institutions	\$48,320

JOB POSTINGS IN CANADA (2018-2023)

312

Unique Postings

679 Total Postings

127

Employers Competing

239,471 Total Employers

2 : 1

Posting Intensity

Regional Average: 2 : 1

Advertised Salary

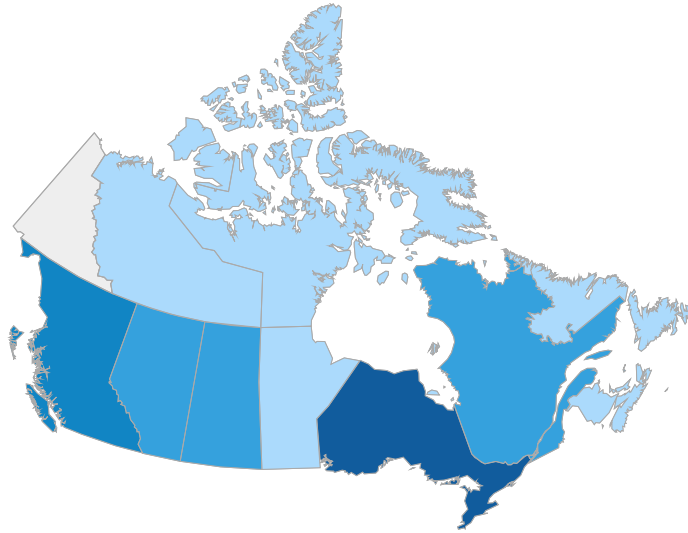
There are 189 advertised salary observations (61% of the 312 matching postings).

\$54.9K

Median Advertised Salary



Job Postings Regional Breakdown



Province	Unique Postings (May 2018 - May 2023)
Ontario	138
British Columbia	84
Alberta	27
Quebec	20
Saskatchewan	15

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	132	42%
High school or GED	1	0%
Associate degree	6	2%
Bachelor's degree	115	37%
Master's degree	72	23%
Ph.D. or professional degree	13	4%





















Experience Breakdown

Minimum Experience	Unique Postings	% of Total
No Experience Listed	189	61%
0 - 1 Years	12	4%
2 - 3 Years	58	19%
4 - 6 Years	48	15%
7 - 9 Years	4	1%
10+ Years	1	0%

Top Companies Posting

	Total/Unique (May 2018 - May 2023)	Posting Intensity	Unique Postings Trend (May 2018 - May 2023)
City of Burnaby	14 / 10	1 : 1	
Workinculture (Cultural Careers Council Ontario)	10 / 9	1 : 1	
University of Toronto	12 / 9	1 : 1	
York University	16 / 8	2 : 1	
CivicInfo BC	9 / 8	1 : 1	
Western University	8 / 6	1 : 1	
Township Of Langley	7 / 6	1 : 1	
Cultural Human Resources Council	5 / 5	1 : 1	
Musée De La Civilisation	7 / 4	2 : 1	
District of West Vancouver	5 / 4	1 : 1	



















Top Cities Posting

City	Total/Unique (May 2018 - May 2023)	Posting Intensity	Unique Postings Trend (May 2018 - May 2023)
Toronto	90 / 66	1 : 1 	
Vancouver	20 / 16	1 : 1 	
Burnaby	19 / 15	1 : 1 	
Calgary	10 / 9	1 : 1 	
Langley	10 / 9	1 : 1 	
Mississauga	12 / 8	2 : 1 	
Victoria	11 / 8	1 : 1 	
Ottawa	32 / 7	5 : 1 	
London	8 / 6	1 : 1 	
Oakville	21 / 6	4 : 1 	

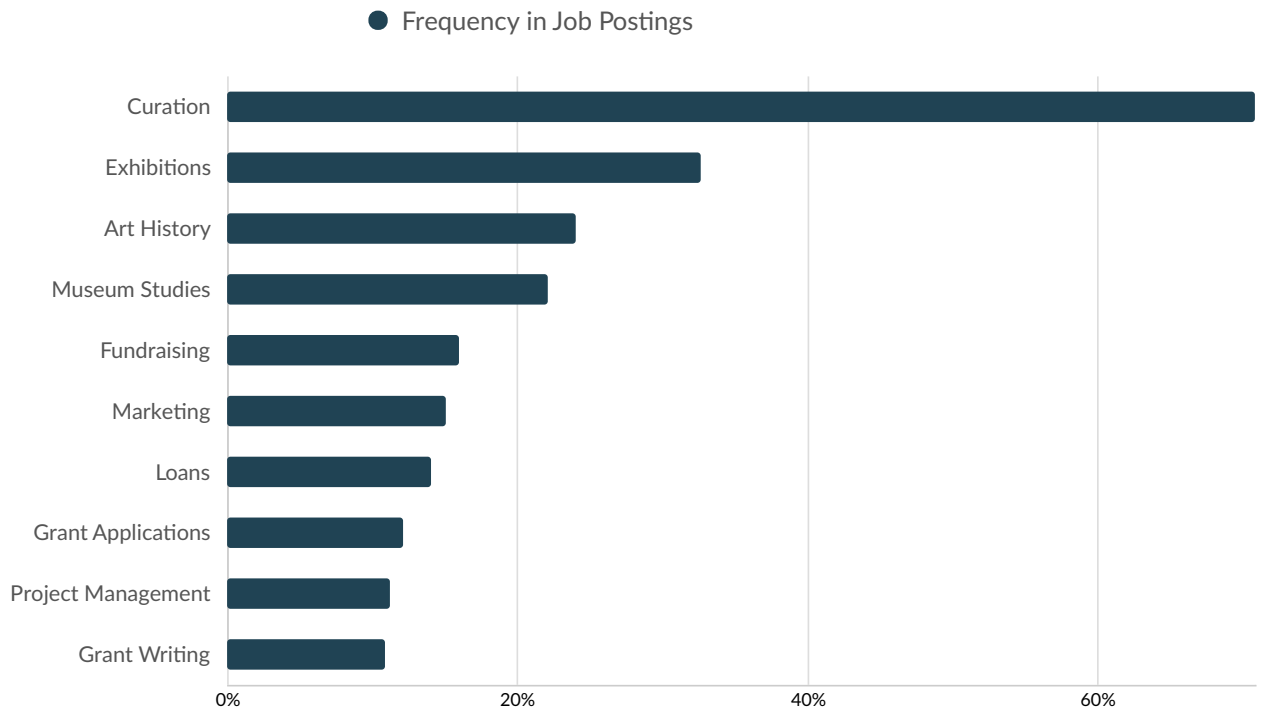
Top Posted Job Titles

	Total/Unique (May 2018 - May 2023)	Posting Intensity	Unique Postings Trend (May 2018 - May 2023)
Museum Curators	292 / 88	3 : 1	
Curators	125 / 85	1 : 1	
Art Curators	75 / 55	1 : 1	
Gallery Curators	70 / 16	4 : 1	
Content Curators	22 / 16	1 : 1	
Chief Curators	16 / 13	1 : 1	
Curators of Collections	27 / 10	3 : 1	
Curators of Exhibitions	12 / 9	1 : 1	
Curators of Exhibits	7 / 7	1 : 1	
Curators of Education	6 / 4	2 : 1	

Top Industries

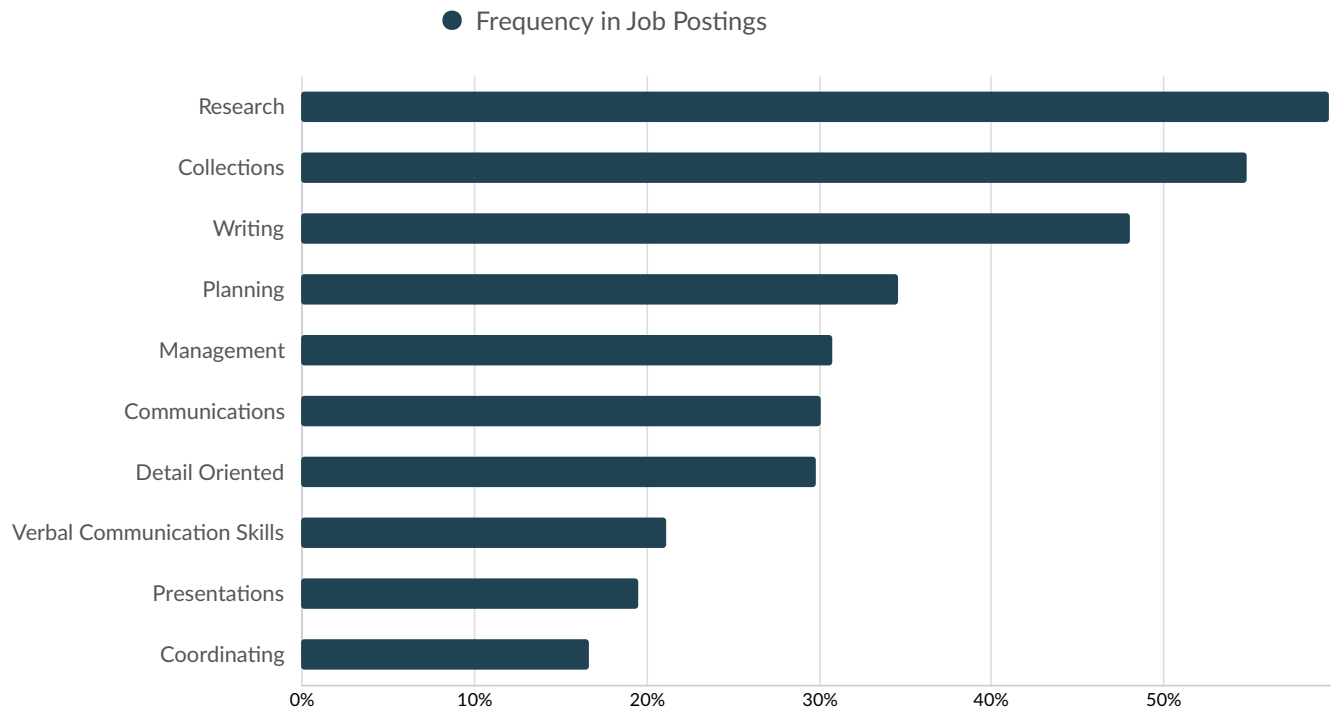
	Total/Unique (May 2018 - May 2023)	Posting Intensity	Unique Postings Trend (May 2018 - May 2023)
Colleges, Universities, and Professional Schools	55 / 37	1 : 1 	
Executive and Legislative Offices, Combined	34 / 22	2 : 1 	
Other General Government Support	26 / 18	1 : 1 	
Museums	17 / 14	1 : 1 	
Promoters of Performing Arts, Sports, and Similar Events with Facilities	10 / 9	1 : 1 	
Executive Offices	8 / 7	1 : 1 	
Elementary and Secondary Schools	9 / 5	2 : 1 	
Junior Colleges	7 / 5	1 : 1 	
Zoos and Botanical Gardens	3 / 3	1 : 1 	

Top Specialized Skills



	Postings	% of Total Postings
Curation	221	71%
Exhibitions	102	33%
Art History	75	24%
Museum Studies	69	22%
Fundraising	50	16%
Marketing	47	15%
Loans	44	14%
Grant Applications	38	12%
Project Management	35	11%
Grant Writing	34	11%

Top Common Skills



	Postings	% of Total Postings
Research	186	60%
Collections	171	55%
Writing	150	48%
Planning	108	35%
Management	96	31%
Communications	94	30%
Detail Oriented	93	30%
Verbal Communication Skills	66	21%
Presentations	61	20%
Coordinating	52	17%

CURRENT JOB POSTING SAMPLES

Canadian Centre for Architecture

Curatorial Assistant

Contractual (3 years), full time (35 hours per week)

Montreal

Job Summary

The Canadian Centre for Architecture is an institution responsive to the cultural content of our time, fueling crucial conversation with the audience. The Curatorial Assistant operates within the CCA Programs division and assists in the production of content with publications, research and collaborates transversally with collection and digital divisions in retrieving and disseminating content. The Programs division explores and organizes exhibitions, develops curatorial projects taking shape in diverse formats (i.e. from cinematographic to editorial) and contributes to public and digital programs as a form of cultural production to suggest new perspectives for architecture debate as catalyst for original inquiry.

The Curatorial Assistant leads the conception, coordination, and production of institutional curatorial activities. The incumbent assists the Associate Director, Programs in the development and content production processes of exhibitions, digital and new media projects such as films and video productions, publishing materials/editorials and public programs. The Curatorial Assistant is an active content producer in all phases of a curatorial project and alongside with guest curators and collaborators of exhibitions. The incumbent works in dialogue with various internal CCA teams, divisions and departments, as well as outside collaborators and content production companies.

Requirements

Master's degree in architecture, art history

3 to 5 years in curatorial projects / exhibitions

Excellent knowledge of spoken and written French

Knowledge in curating and producing exhibitions

Ability to develop content in written form

Musée de la civilisation

Coordonnateur.trice des services muséographiques

Poste régulier - Temps plein

Échelle salariale : 48 963 \$ à 92 831 \$* annuellement, selon l'expérience

Québe

Mandat

Nous sommes présentement à la recherche d'un.e coordonnateur(-trice) des expositions en tournée pour rejoindre la Direction de la programmation!

Ton mandat sera de coordonner les services muséographiques, la menuiserie et toutes autres opérations liées à la réalisation des expositions. Tu seras responsable de superviser, planifier, organiser et coordonner les activités et les services logistiques nécessaires au prémontage, fabrication, installation, montage, démontage, aliénation des biens de diffusion, inventaire, entreposage, transport et emballage des pièces de collection et des installations en salle. Tu agiras comme personne ressource pour assurer la communication entre les différents intervenants et services impliqués.

Tu réponds à ces exigences?

- Être titulaire d'un diplôme universitaire de 1^{er} cycle dans une discipline appropriée**
- De 3 à 5 ans d'expérience dans des fonctions similaires
- Très bonne connaissance du processus de réalisation d'expositions et des principes de la menuiserie et vue d'ensemble de la programmation dans un milieu muséal
- Excellente maîtrise du français parlé et écrit et connaissances fonctionnelles de l'anglais parlé et écrit

***Sous réserve de l'appréciation des compétences, toute combinaison de scolarité et d'expérience jugée équivalente et pertinente pourra être considérée.*

Art Gallery of Ontario

Contemporary Art Curator

Salary \$96,405 to 120,520 annually (to be negotiated) / 35 hours per week

Permanent employment, full time

Toronto

Responsibilities

- Recommend the acquisition of museum and gallery artifacts
- Supervise technicians, assistants, students or interns, staff or volunteers
- Research origins and history of artifacts
- Train technicians, assistants, students or interns
- Develop storyline and theme of displays and exhibitions
- Co-ordinate the storage of collections and setting-up of displays and exhibitions
- Provide consultation to museums, art galleries or private individuals
- Oversee the conservation, display and circulation of collections

Supervision

- 3-4 people

Education & experience

- Master's degree or equivalent experience
- Art history, criticism and conservation
- 5 years or more of experience

Appendix 7: budget

LOI Budget Chart

Department: _____
Program Title: _____

NOTE : ONLY 2023-24 NEED TO BE POPULATED

	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5

EXPENSES

Teaching - Number of Full Time positions	TT %	100%	100%	100%	100%	100%	100%
	ETA %	100%	100%	100%	100%	100%	100%
	LTA %	100%	100%	100%	100%	100%	100%
	Lecturer %	100%	100%	100%	100%	100%	100%

Number of course remissions requested

Technical support - Number of positions

Part Time Contracts - Number of contracts

Teacher's Assistants - Hours

Administrative Staff - Number of positions	Director %	100%	100%	100%	100%	100%	100%
	Office support %	230	200	200	200	200	200
	Professional %	0					
		100%	100%	100%	100%	100%	100%

EXPENSES		Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TEACHING								
	Salary	Salary and Benefits						
Tenure Track	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Extended Term appointment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Limited Term Appointment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lecturer	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Course remissions	\$ 12,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Technical support	\$ 71,000	\$ -	\$ -	\$ -	\$ 44,837	\$ 44,837	\$ 44,837	\$ 134,510
Part Time Contracts	\$ 12,500	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 250,000
Teacher's Assistants	\$ 29.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Stipends	\$ -	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 3,000
Other	\$ 5,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 20,000
ADMIN STAFF								

Comments

A donor will cover the entire salary for a technician at the Curatorial Lab for the first 2 years and the cost of materials is included in the Certificate budget since it is expected the programme will use the Lab up to 1/2 the year. During

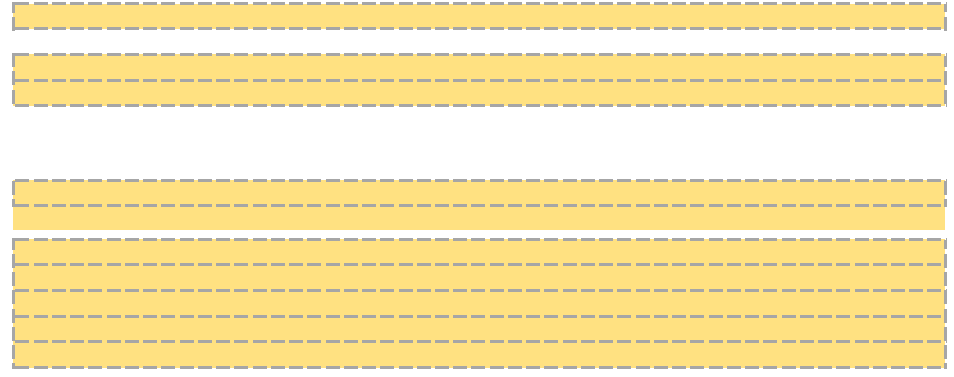
4 new courses developed for the Certificate (the elective will be possible from within existing IMA seminar courses or chosen from other graduate courses (e.g. extraterrestrial film studies, sociology, gender studies, history etc) by

honoraria for invited guests - 200\$ per course in certificate, not practicum or elective

Marketing budget each year

LOI Budget Chart

Director		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Office support	\$ 32	\$ 9,296	\$ 8,083	\$ 8,083	\$ 8,083	\$ 8,083	\$ 8,083	\$ 49,712
Professional		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Payroll		\$ 14,296	\$ 61,683	\$ 61,683	\$ 106,520	\$ 106,520	\$ 106,520	\$ 457,221
OTHER EXPENSES								
New Classroom, renovation and lab equipment - NON-CAPITAL								\$ -
New Classroom, renovation and lab equipment - CAPITAL								\$ -
Rent								\$ -
Taxes								\$ -
Maintenance-Security								\$ -
Operating cost								\$ -
Other								\$ -
Total Other Expenses		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses		\$ 14,296	\$ 61,683	\$ 61,683	\$ 106,520	\$ 106,520	\$ 106,520	\$ 457,221



LOI Budget Chart

Department:
Program Title:

NOTE : ONLY NEED TO BE POPULATED

	2024-25	2025-26	2026-27	2027-28	2028-29
	Year 1	Year 2	Year 3	Year 4	Year 5
STUDENTS					
Cycle 1 FTE (FTE = 30 credits)					
New Cycle 1 FTE registered in the program	 	 	 	 	
Total credits for Program					
Attrition rate	10%				
TOTAL FTE	0.00	0.00	0.00	0.00	0.00
Program Family	Weight				
Choose a Family	0.00				
Weighted FTE	0.00	0.00	0.00	0.00	0.00

Comments

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)	\$ 2,797	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Grants							
Teaching Grant (WFTE)	\$ 3,906	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Support Grant (FTE)	\$ 2,386	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total grants		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
External	 	 	 	 	 	 	\$ -
Total Revenue	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Additional Funding							
Internal							
Provost Office	 	 	 	 	 	 	\$ -
Institutional	 	 	 	 	 	 	\$ -
Capital Fund (1)	 	 	 	 	 	 	\$ -
Other	 	 	 	 	 	 	\$ -
Total internal sources of funding for the faculty	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Department:
Program Title:

NOTE : ONLY NEED TO BE POPULATED

		Year 1	Year 2	Year 3	Year 4	Year 5	Comments
STUDENTS							
Cycle 2 FTE (FTE = 30 credits)							
New Cycle 2 FTE registered in the program		7	7	7	7	7	14 students taking 15 credits = 7 FTE. Short programme, lower attrition rate
Total credits for Program							
Attrition rate							
TOTAL FTE		7.00	7.00	7.00	7.00	7.00	
Program Family							
Fine Arts							
Weight		5.25					
Weighted FTE							
		36.75	36.75	36.75	36.75	36.75	

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)	\$ 2,797	\$ 19,579	\$ 19,579	\$ 19,579	\$ 19,579	\$ 19,579	\$ 97,895
Grants							
Teaching Grant (WFTE)	\$ 3,906	\$ 143,546	\$ 143,546	\$ 143,546	\$ 143,546	\$ 143,546	\$ 717,728
Support Grant (FTE)	\$ 2,386	\$ 16,702	\$ 16,702	\$ 16,702	\$ 16,702	\$ 16,702	\$ 83,510
Total grants		\$ 160,248	\$ 160,248	\$ 160,248	\$ 160,248	\$ 160,248	\$ 801,238
External							\$ -
Total Revenue	\$ -	\$ 179,827	\$ 179,827	\$ 179,827	\$ 179,827	\$ 179,827	\$ 899,133
Additional Funding							
Internal							
Provost Office							\$ -
Institutional							\$ -
Capital Fund (1)							\$ -
Other							\$ -
Total internal sources of funding for the faculty	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Note 1 : Linked to capital expenses

LOI Budget Chart

Department:
Program Title:

NOTE : ONLY NEED TO BE POPULATED

	Year 1	Year 2	Year 3	Year 4	Year 5	Comments
STUDENTS						
Cycle 3 FTE (FTE = 30 credits)						
New Cycle 3 FTE registered in the program	0	0	0	0	0	
Total credits for Program	0					
Attrition rate	10%					
TOTAL FTE	0.00	0.00	0.00	0.00	0.00	
Program Family	Choose a Family					
Weight	0.00					
Weighted FTE	0.00	0.00	0.00	0.00	0.00	

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)	\$ 2,797	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Grants							
Teaching Grant (WFTE)	\$ 3,906	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Support Grant (FTE)	\$ 2,386	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total grants	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
External							\$ -
Total Revenue	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Additional Funding							
Internal							
Provost Office							\$ -
Institutional							\$ -
Capital Fund (1)							\$ -
Other							\$ -
Total internal sources of funding for the faculty	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

LOI Budget Chart

Department:
Program Title:

Program Financial Viability

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)		\$ 19,579	\$ 19,579	\$ 19,579	\$ 19,579	\$ 19,579	\$ 97,895
Grants							
Teaching Grant (WFTE)		\$ 143,546	\$ 143,546	\$ 143,546	\$ 143,546	\$ 143,546	\$ 717,728
Support Grant (FTE)		\$ 16,702	\$ 16,702	\$ 16,702	\$ 16,702	\$ 16,702	\$ 83,510
Total grants		\$ 160,248	\$ 160,248	\$ 160,248	\$ 160,248	\$ 160,248	\$ 801,238
Additional Funding External	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Revenue	\$ -	\$ 179,827	\$ 179,827	\$ 179,827	\$ 179,827	\$ 179,827	\$ 899,133

EXPENSES	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TEACHING							
Tenure Track	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Extended Term Contrats	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Limited Term Contracts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lecturers	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Course remissions	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Technical support	\$ -	\$ -	\$ -	\$ 44,837	\$ 44,837	\$ 44,837	\$ 134,510
Part Time Contracts	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 250,000
Teacher's Assistants	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Stipends	\$ -	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 3,000
Other	\$ 5,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 20,000
ADMIN STAFF							
Administrative Staff	\$ 9,296	\$ 8,083	\$ 8,083	\$ 8,083	\$ 8,083	\$ 8,083	\$ 49,712
Total Payroll	\$ 14,296	\$ 61,683	\$ 61,683	\$ 106,520	\$ 106,520	\$ 106,520	\$ 457,221

LOI Budget Chart

OTHER EXPENSES							
Total Other Expenses	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses	\$ 14,296	\$ 61,683	\$ 61,683	\$ 106,520	\$ 106,520	\$ 106,520	\$ 457,221
CONCORDIA UNIVERSITY SURPLUS / (DEFICIT)	\$ (14,296)	\$ 118,143	\$ 118,143	\$ 73,307	\$ 73,307	\$ 73,307	\$ 441,911

Curatorial Studies and Practices

Admission Requirements

- Bachelor's degree in museology art history, curatorial studies, visual arts, art education, cultural/history studies, or a related field.
- Alternatively, applicants with relevant professional experience, a non-traditional educational path or lived experience will be considered based on their application dossier.
- **Proficiency in English:** applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the [English language proficiency](#) page for further information on the requirements and exemptions.

Degree Requirements

Graduate Certificate in Curatorial Studies and Practices (15 credits)

12.0 credits:

- ARTH 676 Introduction to Curatorial Practices and Theory (3.00)
- ARTH 677 Advanced Topics in Curatorial Practice and Theory (3.00)
- ARTH 678 Exhibition Concept Design (3.00)
- ARTH 679 Curatorial Project (3.00)

3.0 credits chosen from MA seminars within the department of Art History or from across the university with permission of the Graduate Program Director.

Academic Regulations

1. **Academic Standing.** Please refer to the Academic standing section of the Calendar for a detailed review of the Academic regulations .

2. **Time Limit.** Please refer to the Academic regulations page for further details regarding the Time limits . It is expected that students will normally complete the certificate within one year.

3. **Graduation Requirement.** In order to graduate, students must have a minimum cumulative GPA of 2.70.

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Curatorial Studies and Practices Courses

ARTH 676 Introduction to Curatorial Practices and Theory (3 credits)

Description:

This seminar introduces the students to the histories and theories of curatorial practices in various local, national, and international contexts. It also explores a range of historical, social, economic, educational, ethical, legal, technological, and administrative issues concerning curation and various types of institutions. The course introduces both theoretical and historical aspects of curatorial practice from an array of perspectives such as, but not limited to, Indigenous, Black, queer, feminist, and decolonial approaches, and methodologies including cultural analysis, institutional critique, and activist interventions, to cite only a few examples. The choice of topics will vary depending on the expertise of the faculty member.

Component(s):

Seminar

ARTH 677 Advanced Topics in Curatorial Practice and Theory (3 credits)

Prerequisite/Corequisite:

The following course must be completed previously: [ARTH 676](#)

Description:

This course integrates both theoretical and practical aspects of curatorial practice through a decolonized, anti-oppression, inclusive, and sustainable lens. Curatorial engagements from an array of theoretical perspectives and methodologies such as cultural analysis, collaboration, institutional critique, performative interventions, and networked interactivity are investigated. Current debates concerning how exhibitions function as forms of research and knowledge production, as well as their ideological and social conditions are also examined. The choice of topics will vary depending on the expertise of the faculty member.

Component(s):

Seminar

ARTH 678 Exhibition Concept Design (3 credits)

Prerequisite/Corequisite:

The following course must be completed previously: [ARTH 676](#) . The following course must be taken previously or concurrently: [ARTH 677](#)

Description:

This course focuses on the research and planning process of a significant project that can be actualized in [ARTH 679](#): Curatorial Project. In addition to developing practical professional skills for exhibition design, such as proposal preparation and budget management, students gain theoretical professional experience by drafting a prospectus or other first deliverable for the project and presenting this to the cohort to refine and strengthen the final work. The course takes advantage of projects, available spaces, planned cultural events or exhibitions taking place in any given year. Students become familiar with the diverse facets and various functions of a given professional environment on a theoretical level.

Component(s):

Seminar

ARTH 679 Curatorial Project (3 credits)

Prerequisite/Corequisite:

The following courses must be completed previously: [ARTH 676](#) , [ARTH 677](#) , [ARTH 678](#) .

Description:

Students carry out the project researched and planned in ARTH 678, allowing them to be involved from inception to completion. The goal of this practicum is to provide students with the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work. The hands-on experience and training aspect is enhanced through the supervision and mentorship of the faculty teaching the course as well as the site supervisor. During the practicum course, students gain professional experience through the realization of a significant project.

Component(s):

Practicum/Internship/Work Term

Summary and Rationale for Changes

(see the program description and rationale in the program proposal for more details)

This dossier (**ARTH-5507**) proposes the creation of a 12-credit *Microprogram in Curatorial Studies*.

The accompanying dossier (**ARTH-5506**) proposes the creation of a 15-credit *Graduate Certificate in Curatorial Studies and Practices*.

Both programs were proposed in one LOI and the program proposal in both dossiers is the same.

To complete the 15-credit *Graduate Certificate in Curatorial Studies and Practices*, students are required to complete four (4) newly created 3-credit courses: ARTH 676, ARTH 677, ARTH 678, ARTH 679, as well as three credits of electives selected from MA seminars offered from within the department or from across the university. ARTH 679 - the final course of the 4-course sequence described above - is a curatorial project/practicum that allows students to apply the theoretical knowledge gained thus far.

The 12-credit *Microprogram in Curatorial Studies* consists of three (3) of the newly created 3-credit courses: ARTH 676, ARTH 677, ARTH 678, and three credits of electives selected from MA seminars offered from within the department or from across the university. The Microprogram does not include the 3-credit practicum course (ARTH 679) and is aimed at students who are already working in the curatorial area. Students receive a letter of attestation upon completion of the microprogram. Students who complete the microprogram can – if they decide to – then complete the practicum course (ARTH 679) and receive the graduate certificate. As such, the microprogram can be ‘stacked’ into the graduate certificate.

The proposal addresses requests made in the memo from the Vice-Provost, Innovation in Teaching and Learning:

1. Clarification of program titles.
2. Greater inclusion and highlighting of skills development within the program.
3. Clarification of admissions requirements.
4. Clarification of scheduling options for working students.
5. Impact of the proposed programs on the existing Art History MA

Resource Implications

There are minimal resource implications which have been reviewed and approved by Dr. Annie Gerin, Dean, Faculty of Arts.

Summary of Committee Discussion: APC approval

For Submission to:

Graham Carr, President and Vice Chancellor,
Senate, 17 May 2024

Approved by:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 16 Apr 2024

Following approval of the Faculty Councils, APC members reviewed the curriculum submission FA-ARTH-5507; APC-2024-3-D3.

As a result of discussions, APC resolved that FA-ARTH-5507; APC-2024-3-D3 be forwarded to Senate for approval.

Summary of Committee Discussion: CSGS approval

For Submission to:

” ”
”

Approved by:

” ”
”

CSGS approval for microprograms is delegated to GCC.

Summary of Committee Discussion: GCC approval

For Submission to:

Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning,
Academic Programs Committee, 16 Apr 2024

Approved by:

Rachel Berger, Associate Dean, Academic Programs and Development,
Graduate Curriculum Committee, 04 Mar 2024

The GCC approved the enclosed curriculum changes with minor modifications (GCC 2324 7 D7). I therefore recommend that the Academic Programs Committee approve and recommend to Senate the aforementioned proposal in its final form.

Summary of Committee Discussion: Faculty Council Approval

For Submission to:

Dr. Rachel Berger, Associate Dean, Academic Programs and Development, School of Graduate Studies,
Graduate Curriculum Committee, 04 Mar 2024

Approved by:

Dr. Annie Gerin, Dean, Faculty of Fine Arts,
Faculty Council, 16 Feb 2024

The Fine Arts Faculty Council reviewed and approved the ARTH-5507 curriculum dossier at their meeting of February 16, 2024.

We hereby submit this dossier for review by the Graduate Curriculum Committee on March 4, 2024.

There are minimal resource implications which have been reviewed and approved by Dr. Annie Gerin, Dean, Faculty of Arts.

Summary of Committee Discussion: Faculty Curriculum Approval (FCC/FAPC)

For Submission to:

Dr. Annie Gerin, Dean, Faculty of Fine Arts,
Faculty Council, 16 Feb 2024

Approved by:

Dr. Elaine Cheasley Paterson, Associate Dean, Academic Programs and Pedagogy,
Faculty Curriculum Committee, 17 Jan 2024

The Faculty of Fine Arts Curriculum Committee reviewed and approved the ARTH-5507 curriculum dossier at their meeting of January 17, 2024.

We hereby submit this dossier for review by the Faculty Council on February 16, 2024.

There are minimal resource implications which have been reviewed and approved by Dr. Annie Gerin, Dean, Faculty of Arts.

NOTE:

Summary of Committee Discussion: Department approval

For submission to:

Elaine Cheasley Paterson, Associate Dean, Academic Programs and Pedagogy,
Faculty Curriculum Committee, 17 Jan 2024

Approved by:

John Potvin, Department Chair,
Department Council, 10 Mar 2023

The members of Department Council approved the curriculum changes below at a meeting on March 10, 2023:


- Creation of 12-credit Microprogram in Curatorial Studies
- Creation of 15-credit Graduate Certificate in Curatorial Studies and Practices

**NEW PROGRAMS PROPOSAL
– FAST-TRACK PROCESS**

Letter of Intent for new Programs may enter the Fast-Track Process under the following conditions:

- The program meets an academic, strategic and/or societal need; and
- There are no significant resource demands implied by the process; and,
- The program does not require MEES approval.

GENERAL INFORMATION

Name of Proposed Program and Nomenclature:	1. Graduate Certificate in Curatorial Studies and Practices 2. Graduate Microprogram in Curatorial Studies
Hosting unit(s):	Department of Art History
Proposed Start Date:	Fall 2025
Prepared by:	Alice Ming Wai Jim, Michelle McGeough, Heather Igloliorte, Joana Joachim, Rebecca Duclos, Marie-Ève Marchand, Christopher Cooke
Dean Signature(s):	
Date:	21 December 2023

PROPOSED PROGRAM INFORMATION

1. Program Description (approx. 1 page):

a. Provide a brief description of the program and its rationale.

Description

The Graduate Certificate in Curatorial Studies and Practices is a 15-credit program that consists of the four courses that form the 12-credit Microprogram in Curatorial Studies and a 3-credit practicum course. The Certificate and Microprogram are taught through a decolonized, inclusive, and sustainable lens, providing graduates of the program with the necessary theoretical and practical skills to work successfully in the field. Students who complete the stand-alone Microprogram in Curatorial Studies will receive a letter of attestation. The Microprogram can be stacked into the

Graduate Certificate in Curatorial Studies and Practices with the addition of the 3-credit practicum course (ARTH 679). Alternatively, students may enroll directly into the Graduate Certificate in Curatorial Studies and Practices and complete the five required courses. The 3-credit practicum (ARTH 679) is not a stand-alone course and can only be completed by either completing the 12-credit Microprogram, or by completing the first four courses of the Graduate Certificate.

The Graduate Certificate relies on a core set of pedagogical principles: curating is a malleable and mobile craft with its own histories, practices, and locations that need to be continually reviewed and renewed as part of a larger cultural critique; curating is both a topic of study and a lived practice making the experience, training, acquired wisdom, and place-based knowledges that individuals bring to a graduate program another form of “expertise” to be shared; curating is often site-responsive or site-specific with individuals, often embedded in communities of practice, who require new modes of curriculum delivery to bring research, reflection, analysis, and peer-networks to the learner in-situ.

The planned inclusive, decolonized program design allows us to rethink possible outcomes for diverse groups of learners. As evidenced in the environmental scan (see **Appendix 1**) prepared as part of the development of this program, there is a lack of focus on decolonizing and sustainability efforts in similar curatorial programs which places our proposed Certificate as a leader in this area. The unique program design for the Graduate Certificate in Curatorial Studies and Practices relies upon a set of courses developed in concert with members of the Department of Art History and invited scholars and practitioners.

Rationale

It is an exhilarating, exciting, and challenging time for cultural workers across the globe. As we near the first quarter of the twenty-first century, we can see just how much the field of curatorial practice has expanded and evolved in conjunction with rapid societal change. While museums, galleries, performance and presentation spaces, artist-run organizations, collectives, and collaboratives develop new modes of public engagement, interpretive practice, and community consultation, the role of the “curator” grows increasingly complex. What does it mean to “curate” in today’s world? Attendant to these questions is, of course, the role of training and professional preparation: *what are the most vibrant responsive, and inclusive conditions for curatorial education today?* As traditional modes of collecting and curatorial authority are increasingly challenged by diverse publics and contemporary social movements such as Idle No More, Black Lives Matter and #StopAsianHate, it is urgent that the next generation of curators are trained in research and creating exhibitions which encourage new dialogues between artmakers, curators, community, and the public while encouraging sustainable curating practices in decolonized spaces.

Concordia Fine Arts is one of the largest comprehensive schools of arts, performance, and design in Canada. We are proud to be part of a university which “dares to be different and draws on its diversity to transform the individual, strengthen society and enrich the world.” Our Faculty has the institutional resources, the broad community support, the professional networks, and the international contacts to create a thriving program. The practical, theoretical, scholarly, and community-based expertise represented by faculty members in the Department of Art History is extensive and encompasses strategic areas of interest directly tied to the Certificate’s delivery: diversity, inclusion, Indigenous ways of knowing, anti-oppression pedagogy, social practice, community engagement, archival activation, historical precedents, institutional critique, intercultural and inclusive educational programming, material culture analysis, media production/dissemination, exhibition and interpretive design to name but a few. The Graduate Certificate relies on the research and teaching strengths of the Department and utilizes resources uniquely available within the

Faculty of Fine Arts' eight other academic units and associated cultural spaces within and outside the University.

The inclusion of 'Practices' in the title of the proposed Graduate Certificate highlights the practical nature of the program and importance placed on experiential learning and the goal to prepare program graduates for the reality of working in the field of Curation.

b. Describe the target audience of the program and admissions requirements and targets.

Target audience

The intended audience is plural "audiences" in our case. The Department of Art History's Graduate Certificate in Curatorial Studies and Practices employs a unique stackable program design that would be the first of its kind in Canada (perhaps internationally) to meet advanced, "seasoned" learners *where they are* in their own academic, professional, cultural, geographical moment in order to bring their specific context into the course material and class discussion. The program intends to be accessible to a wide range of learners. We openly welcome a diversity of individuals who choose to pursue advanced training, professionalization, expanded peer networking, and critical deepening of their cultural work within complex societies. Our program would be designed to guide and nurture arts and non-art graduates pursuing historical or material practices; early-career professionals; transitioning cultural workers; non-traditional learners; as well as individuals and those working as part of collectives. The Department of Art History's commitment to equity, diversity, inclusion, sustainability, and accessibility is fundamental to this effort to make this program accessible to as wide a range of students as possible. Students at Concordia may complete all work in French and, as such, these programmes may appeal to both francophone and French-speaking students seeking this approach to pedagogy and the opportunity to complete the practicum in a French-speaking institution.

Admissions requirements

1. In order to achieve the program's goal of being accessible to a wide range of learners, applicants must either:
 - a. Possess a bachelor's degree in museology, art history, curatorial studies, visual arts, art education, cultural/history studies, or a related field.

or:

 - b. Have professional equivalency or have followed a non-traditional educational path or lived experience. This will be evaluated on the basis of a letter of intent that includes:
 - i. An account of the student's professional experience in the fields of museology, art history, curatorial studies, visual arts, art education, cultural/history studies or a related field, focusing on transferable skills obtained through these experiences.
 - ii. A detailed CV that includes the student's educational and professional pathway to date.
 - iii. Two letters of reference from previous employers, collaborators, community members, etc.
 - iv. Students may include a description of any completed curating projects and, if possible, budget and funding information.
2. *Proficiency in English:* applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the Graduate Admission page for further information on the Language Proficiency requirements and exemptions.

Target

Expected number of students:12-16.

2. Curriculum (approx. 2 -3 pages):

- a. Describe the overall program objectives, as well as a description of the specific learning outcomes of the degree. A curriculum map should be included.**

The 12-credit Microprogram in Curatorial Studies, or the first four courses of the Graduate Certificate in Curatorial Studies and Practices, aim to advance studies that are foundational to the specialization in curatorial history, theory, and practice. Participants will examine and discuss major issues and topics across a range of methodological and theoretical approaches through a decolonial lens.

The 3-credit practicum required to complete the Graduate Certificate will allow students to implement the skills they have acquired to design critical, sustainable, accessible curatorial spaces, and to develop inclusive cultural programs and exhibitions.

Program learning outcomes:

By the end of the **12-credit Microprogram in Curatorial Studies, or the first four courses of the Graduate Certificate in Curatorial Studies and Practices**, students will be able to:

1. Call into question and critically discuss historical and current trends in curatorial practice, theory, criticism, and community engagement as case studies and exemplars for contemporary practice;
2. Analyze and critique the conceptual, aesthetic, and ethical challenges of inclusive curatorial practices within a variety of institutional and non-institutional milieus;
3. Develop a critical curatorial practice and apply their knowledge of the milieu to design an independent curatorial, public programming, educational, interpretive, evaluative, or research-based project;
4. Research, identify, construct and evaluate arts programming that is consistent with the vision and mandate of organizations that promote decolonization efforts.

By the end of the **3-credit practicum (ARTH 679)** students will be able to:

1. Demonstrate an ability to realize a physical project in an advanced format that may be exhibited, installed, published, distributed, funded, enacted, or activated in a reportable manner, applying the theoretical principles presented in ARTH 678.
2. Develop strategies to define their own career objectives and understanding of the arts sector through building networks that will inform their professional goals while allowing them to practice advocacy skills on behalf of the arts they represent.

- b. Describe in detail the curriculum of the program, including how students are expected to progress through the program. If the program is designed to be a pathway program (e.g., stacked degrees), please outline what other curricular changes beyond this proposal are needed to support this objective.**

Program structure

To complete the 15-credit Graduate Certificate in Curatorial Studies and Practices, the student is required to complete five (5) 3-credit courses: ARTH 676, ARTH 677, ARTH 678, ARTH 679, and three credits of electives selected from MA seminars offered from within the department or from across the university.

The 12-credit Microprogram in Curatorial Studies consists of four (4) 3-credit courses: ARTH 676, ARTH 677, ARTH 678, and three credits of electives selected from MA seminars offered from within the department or from across the university.

The four courses of the Microprogram - which are the first four courses of the Graduate Certificate - provide a thorough grounding in current decolonized, inclusive, and sustainable curatorial theories and practices. The practicum (ARTH 679) provides the remaining three credits of applied knowledge to complete the Graduate Certificate.

Students in both programs take two 3-credit courses in the Fall session (ARTH 676 + elective), and two 3-credit courses in the Winter session (ARTH 677 + ARTH 678). To complete the Graduate Certificate, students must then also complete the practicum course ARTH 679 in the Summer session. Students who choose only to complete the 12-credit Microprogram (and not to continue with the 3-credit practicum) will most likely be current curatorial practitioners who won't need the practicum experience. Completing the 12-credit Microprogram will allow them instead to apply the theoretical knowledge acquired to their existing professional curatorial practice.

Graduate Certificate and Microprogram:

Certificate		Session	Courses
15-credit Graduate Certificate in Curatorial Studies and Practices	12-credit Microprogram in Curatorial Studies	F	ARTH 676: Introduction to curatorial practice and theory (3 credits) Elective (3 credits)
		W	ARTH 677: Advanced topics in curatorial practice and theory (3 credits) ARTH 678: Exhibition concept design (3 credits)
	3-credit practicum	S	ARTH 679: Curatorial project (3 credits)

Required courses: The new courses ARTH 676, ARTH 677, and ARTH 678 are required courses for students in the Microprogram in Curatorial Studies. The same courses and the new course ARTH 679 are required courses for students in the Graduate Certificate in Curatorial Studies and Practices. Note that ARTH 676 may be cross-listed with the existing ARTH 649 – Aspects of Curatorial Practice, a 3-credit seminar course that the Art History department already teaches in this area.

Elective course: chosen from the roster of MA seminars on offer within the department of Art History or from outside the Department's offering with permission from the GPD in Art History. This will enable students to deepen their knowledge in an area or topic particularly relevant and informative to their curatorial training, approach, or project.

Course sequence and completion schedule: Courses must be taken in the order listed above, as each course builds on the previous course. They function as interconnected knowledge blocks and as a result, must be taken in sequence. The courses are designed to facilitate integration of theory and practice. Each course will reinforce previous learning while introducing new concepts and specialized topics. At the completion of the Microprogram in Curatorial Studies or the first four courses of the Graduate Certificate in Curatorial Studies and Practices, students will have developed a robust understanding of curatorial histories and theories and have the ability to evaluate and critique these notions. Students will also have acquired curatorial design skills that will culminate in the 3-credit summer practicum with ARTH 679.

To provide greater access to students with work or other weekday commitments, seminars may be scheduled once a week in the evenings or alternatively in condensed format, over several weekends or several evenings over fewer weeks for example. Additionally, all courses are able to incorporate hybrid or blended teaching modalities which can increase flexibility and accessibility to the program.

In exceptional circumstances, and with medical or supporting documents and approval of the department, a student may interrupt their studies. All remaining courses must be completed in the subsequent term when the course is offered. Students who are unsuccessful in a given course would need to wait until the course is offered again in another academic year.

(See **Appendix 2** for curriculum mapping)

Course descriptions:

ARTH 676: Introduction to curatorial practice and theory (3 credits)

This seminar introduces the students to the histories and theories of curatorial practices in various local, national, and international contexts. It also explores a range of historical, social, economic, educational, ethical, legal, technological, and administrative issues concerning curation and various types of institutions. The course introduces both theoretical and historical aspects of curatorial practice from an array of perspectives such as, but not limited to, Indigenous, Black, queer, feminist, and decolonial approaches, and methodologies including cultural analysis, institutional critique, and activist interventions, to cite only a few examples. The choice of topics will vary depending on the expertise of the faculty member.

ARTH 677: Advanced topics in curatorial practice and theory (3 credits)

This course integrates both theoretical and practical aspects of curatorial practice through a decolonized, anti-oppression, inclusive, and sustainable lens. Curatorial engagements from an array of theoretical perspectives and methodologies such as cultural analysis, collaboration, institutional critique, performative interventions, and networked interactivity are investigated. Current debates concerning how exhibitions function as forms of research and knowledge production, as well as their ideological and social conditions are also examined. The choice of topics will vary depending on the expertise of the faculty member.

ARTH 678: Exhibition concept design (3 credits)

This course focuses on the research and planning process of a significant project that can be actualized in ARTH 679: Curatorial Project. In addition to developing practical professional skills for exhibition design, such as proposal preparation and budget management, students gain theoretical professional experience by drafting a prospectus or other first deliverable for the project and presenting this to the cohort to refine and strengthen the final work. The course takes advantage of projects, available spaces, planned cultural events or exhibitions taking place in any given year. Students become familiar with the diverse facets and various functions of a given professional environment on a theoretical level.

ARTH 679: Curatorial project (3 credits) [practicum]

Students carry out the project researched and planned in ARTH 678, allowing them to be involved from inception to completion. The goal of this practicum is to provide students with the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work. The hands-on experience and training aspect is enhanced through the supervision and mentorship of the faculty teaching the course as well as the site supervisor. During the practicum course, students gain professional experience through the realization of a significant project.

(See **Appendix 3** for sample syllabi and **Appendix 4** for internship agreement for ARTH 679)

- c. Describe the innovative or distinguishing features adopted in the design, delivery and pedagogy of the program (e.g., ties to future skills development, online/flipped components, experiential learning opportunities, flexibility in design through stacked certificates, etc).**

A key distinguishing feature of this Graduate Certificate is the progression from 'theoretical' concepts of curatorial studies and practices in the Microprogram in Curatorial Studies or the first four courses of the Graduate Certificate in Curatorial Studies and Practices to the practical application in the 3-credit practicum (ARTH 679). This flexibility would allow, for example, students with considerable curatorial experience to decide to complete the 12-credit Microprogram in Curatorial Studies in order to remain up to date with current scholarship and approaches to the field and forego the 3-credit experiential practicum. It also allows students to stack the Microprogram into the Graduate Certificate. As can be seen in the environmental scan, similar programs rarely offer this kind of flexibility that allows students to tailor their educational pathway to their individual needs.

The 3-credit practicum (ARTH 679) provides added value as the practical project work undertaken will benefit students who wish to pursue a career in the field by demonstrating that they have both subject matter and application expertise. Those students who complete the 3-credit practicum will leave the program with a strong portfolio which will be invaluable as they seek positions in the curatorial field. The 3-credit practicum is based on principles of experiential learning, the practical nature of which encourages 'learning by doing'.

Other distinguishing features include (a) a uniquely modular design utilizing multiple pathways to suit students' individualized needs; (b) an elective chosen from an array of courses covering historical, theoretical, professional, technical, research-based topics, among others; and (c) accessible entrance requirements welcoming students from diverse backgrounds and professional fields who have an interest in curation in its broadest terms. The environmental scan shows that the inclusion of an elective course differentiates this program from many other curatorial programs in that it allows

students to select courses that address their specific area of interest. The scan also shows that most post-graduate programs require all students to have an undergraduate degree. However, our admission requirements will open up the program to a broader, more diverse range of students.

Concordia itself is uniquely valuable as a site for students in this Graduate Certificate to engage with through multiple professional endeavours including the anticipated Curatorial Lab planned with donor support as a space of experimentation and dissemination of the curatorial research of this Graduate Certificate. The initial two years and the set-up of the costs of the Lab will be covered by the donor. There is also the established FOFA Gallery, Leonard & Bina Ellen Art Gallery, Jarislowsky Institute for Studies in Canadian Art, Concordia Film Festival, 60 x 60, Studio 7, MFA Open Studios, Art Matters, among others.

Finally, the power of embedded, localized experience – and the need for guided, reflexive analyses of these experiences – is respected in the program design. Courses will create space for learners to envision their own communities as both “content” and “case study” for analysis, intervention, and reflection.

3. Demand and Societal Need (approx. 1 - 1.5 pages)¹:

- a. Describe how this program will address current or future societal needs, emerging trends in research and/or higher education.

Our proposed Graduate Certificate in Curatorial Studies and Practices would fill two interconnected needs at this time. First and foremost, it will help to professionalize and to diversify our program’s pedagogy and our graduate curriculum. Secondly, it will help improve our graduate students’ employability after they finish their degree.

Traditionally, art history graduate programs have trained students primarily for academic, classroom-based teaching and research (via coursework, teaching and research assistantships, conference presentations, etc.). Although the number of art history graduate programs have increased significantly in recent decades, the number of tenure-track teaching positions in universities, as well as the number of stable teaching positions in colleges and CÉGEPs, have not followed accordingly. Indeed, as noted in a study on the future of the PhD in the Humanities produced by McGill University in 2013, almost 80% of humanities graduates do not find employment in colleges/universities, and thus need to find positions in adjacent fields or in other professional areas. In light of these statistics, we feel that there is a growing need for art history graduates who have transferable skills and are able to communicate research and ideas to diverse publics outside of academia. By becoming active as curators and as researchers, our graduates will thus have greater chances to participate in new forms of knowledge transfer and to actively shape contemporary discourse in the cultural field. The proposed program would also allow the Art History department to address various pressing social questions, such as: the accessibility of museums and other exhibition spaces (disability, neurodivergence, etc.); the diversity in museum and curatorial staff; the structural changes in museums reflecting evolving social values (e.g. equity-deserving groups, LGBTQ+ rights, multiple intersecting histories, sustainability in curatorial practices, Truth and Reconciliation/Indigenous rights), as well as the formative role of various new technologies on museum and exhibitions spaces in a post-COVID world. These social issues are integral to the Faculty of Fine Arts’ Strategic Plan and Concordia’s strategic directions.

¹ The Office of Institutional Planning and Analysis should be consulted. Other possible data points also include labour market data supplied by the provincial and federal governments, other reports that reference future job skills. The Office of the Vice-Provost, Innovation in Teaching and Learning also may be able to provide more refined data.

Furthermore, a new Graduate Certificate in Curatorial Studies and Practices will contribute to Concordia's Faculty of Fine Art's practice-led research streams and to our ongoing efforts towards offering different kinds of experiential learning opportunities. The Graduate Certificate would also encourage students, faculty, local museum professionals and cultural workers to collaborate on a regular, interdisciplinary basis. The Graduate Certificate will offer enrolled students the chance to work on curatorial projects through our associations with local institutions, while the large number of artist-run centres in the city are also potential partners. Indeed, the proposed Graduate Certificate will help emerging artists, art historians, and many other cultural workers to gain a socially grounded and critical understanding of curatorial histories and theories and provide them with a foundational knowledge of the various administrative frameworks, technical procedures and ethical protocols that are an essential part of curating art exhibitions and cultural projects today. The focus of our Graduate Certificate will help consolidate our Department's strong focus on modern-contemporary art and cultures in a global context, and will encourage a hands-on approach to the study of material and visual culture more broadly. The program will also seek to train students in the multiple forms of writing that intersect with curatorial projects: grant-proposals, interpretive panels, exhibition catalogues, etc. The end goal is to help our alumni find gainful employment in various types of professional settings, such as university galleries, museums, commercial spaces, print or online journals/magazines, "maisons de la culture", artists run centres, and not-for-profit organizations.

As can be seen in the environmental scan (**Appendix 1**), our proposed Graduate Certificate would meet a direct need in the Montreal area and in the province of Quebec as it would be the sole English-language curatorial program offered. While there are other similar programs in Quebec, two of them, the Certificat en muséologie et diffusion de l'art at UQÀM and the Certificat en muséologie et patrimoines at UQO Gatineau, are at the undergraduate level (30 credits) and are more focused on museum studies. In terms of graduate programs, there is the Diplôme d'études supérieures spécialisées en muséologie at Université Laval in Quebec City, but it is also focused on museums and is twice as long (30 credits instead of our proposed 15 credits structure). It is also outside of Montreal, and is thus geographically removed from our metropole's extensive network of museums, galleries, etc. The Department of Art History has a well-established bilingual graduate milieu fostered through its inter-university [doctoral program](#) (with UQAM and UdeM). Thus, ideally these programs would attract both English- and French-speaking students who are drawn to Concordia's offerings as a meeting of cultures with the shared goal of discovering and implementing decolonized methodologies. It is to be noted that students are able to submit coursework in both English and French. The proposed program would also be an interesting and affordable alternative for students coming from other Canadian provinces who might otherwise have enrolled in Carleton's, OCAD's or UBC's graduate programs, all of which are longer programs.

(See **Appendix 5** for letters of support from industry and **Appendix 6** for Market Research Report)

- b. Describe the type of students the program is expected to attract (e.g., lifelong learners, international students, etc.).

We anticipate various types of students for these new programs: recent art history graduates; independent curators/cultural workers wanting to sharpen their skills; long-time museum/community workers wanting to update their knowledge of the field; BIPOC arts workers wanting to enter the field, etc. Building on our existing strengths, we intend to develop a program that will be attractive to Indigenous students and students of colour as part of the larger project of ensuring a future of curatorial practice that is more inclusive. The admission requirements will make the Microprogram

and Graduate Certificate open to less traditional learners such as those who may not have an undergraduate degree but who have considerable relevant professional experience.

We expect that a significant number of applicants for this Microprogram and Graduate Certificate will be from Montreal and other towns in the province of Quebec, including some of our current undergraduates and MA in Art History students. Our programs will be open to students coming from other disciplines, such as geography, history, anthropology, science and technology studies, archival studies, etc. We also envision receiving applications from MFA students who are active as independent curators and/or who incorporate the display of archival material as part of their creative/art practices.

- c. Provide a rationale for how there is demonstrable student interest in, demand for and capacity to support the program (e.g., feeder programs at other institutions like cégeps or within Concordia; data indicating hiring trends or areas of growth in industries; data indicating the emergence of an important research field).

It is expected that there will be considerable interest in this Microprogram and Graduate Certificate from Art History, Art Education and Studio Arts students. Students from other Concordia programs in Sociology and Anthropology, History, Geography could be interested in our new programs. There is clear capacity to support the program as a number of the department's current faculty members have been, or are currently, active as curators, such as Dr. Alice Ming Wai Jim, Dr. Rebecca Duclos, Dr. Michelle McGeough, and Dr. Joana Joachim, and would be excellent mentors for our future students. This level of expertise could also lead to the creation of a course in which our various faculty members are invited to give a guest lecture on an important exhibition they have had the chance to study or curate, both in terms of its discourse but also its specific exhibition modalities (display, scenography, text, catalogue, etc.).

4. Institutional Fit (approx. 1 page): Provide an explanation of how the proposed program fits within the Faculty and University at large.

The culture and research output of the Department of Art History is in robust alignment with Concordia University's strategic plan and directions as described in the Strategic Research Plan (2018-23) as well as the Faculty of Fine Arts' [Strategic Plan](#) (2022-2027). With the recent tenure-track hiring of Dr. Balbir Singh for the Canada Research Chair in Art and Racial Justice (Tier 2), we are building upon existing research strengths in the areas of postcolonial approaches, critical race studies, migration studies, Indigenous and decolonizing analyses (May Chew, Alice Ming Wai Jim, Joana Joachim, Michelle McGeough) that align directly with core institutional priorities regarding equity, diversity, and inclusion. These moves to develop decolonized, anti-racist, and sustainable offerings are a cornerstone of the proposed Graduate Certificate. Similarly, we are expanding in new directions within long-established departmental areas of scholarly excellence, including visual and material culture (Elaine Cheasley Paterson, John Potvin, Johanne Sloan, Steven Stowell), Canadian art and architecture (Martha Langford, Nicola Pezolet, Anne Whitelaw), and feminisms and art history (Elaine Cheasley Paterson, Cynthia Hammond, Kristina Huneault, Michelle McGeough). Our department has also shown leadership in research-creation, interdisciplinary methodologies, oral history, and critical curatorial and museological work (Rebecca Duclos, Cynthia Hammond, Alice Ming Wai Jim), and it is precisely this latter cluster that is the direction in which we plan to expand with the proposed Graduate Certificate.

Our funded research projects, publications, and exhibitions are powerful means by which our faculty foster strong relationships with galleries, museums, artist-run centres, archives, publishers, and

community groups in Montreal and Quebec. This work is also a way in which we will be able to engage students in the Graduate Certificate program both in paid, career-relevant work, and in communities of practice that serve to foster professional networks well beyond the end of the program. In this way, our vibrant departmental culture means that students do not just benefit from faculty research; they are an intrinsic part of our research outputs and our knowledge mobilization. It is this dynamic that leads our students to being sought out for professional work in the arts upon graduation. Our alumni are now employed in key positions at the McCord Museum, the Montreal Museum of Fine Arts, the Canadian Centre for Architecture, Artexte, the Museum of Jewish Montreal, the Canadian Clay and Glass Museum, the Musée d'art de Joliette, the National Gallery of Canada, and the Canadian Museum of Immigration at Pier 21. As the Graduate Certificate aims to attract students from other disciplines (History, Anthropology, Sociology, among others) this will lead to connections with a wider range of institutions and organizations.

The Department of Art History regularly collaborates with key campus spaces that support state-of-the-art research and research-creation. Our most frequent collaborations take place with the University-recognized research unit, the Gail and Stephen A. Jarislowsky Institute for Studies in Canadian Art (JI), presently directed by Dr Martha Langford. The JI hosts events and fosters team research initiatives that represent cutting-edge studies in settler-colonial art histories and Indigenous and diasporic art in the geopolitical territory of Canada. We also work frequently with 4th Space, Concordia's trans-faculty, research showcase, until 2023 directed by Dr Anna Waclawek, an alumna of our doctoral program. We co-host events, colloquia, and pedagogical activities in this street-level space, thus putting Art History on the ground and in the eyes and minds of our community. We have also worked with the Centre for Oral History and Digital Storytelling (COHDS), another University-recognized research unit (co-directed for three years by Dr Cynthia Hammond, who remains a core member) that supports oral history research-creation. Several faculty members and many students are affiliates of COHDS, which offers access to significant research facilities, including a computer lab and high-tech performance space, the Acts of Listening Lab, and offers student research. These spaces will prove beneficial to students of the Graduate Certificate program who are seeking professional and hands-on experience, and in turn these spaces will benefit from working with students and graduates who are steeped in current practices in curatorial studies.

Our students are in many ways the best illustration of how the Department of Art History aligns with, indeed, propels the University's strategic directions forward. Students in this Microprogram and Graduate Certificate will benefit from our four active student research groups: the Concordia Undergraduate Journal of Art History; the Art History Graduate Students Association; the Ethnocultural Art Histories Research group (a group that extends beyond Concordia); and Ylara, a student-run, undergraduate feminist art publication. These groups do remarkable work in recruiting future students and, in their well-established mentoring dynamic and community spirit, do much to welcome and retain current students in our programs.

5. Program Alignment within Unit (approx. 1 page): Describe how the program aligns with your unit/department. Please provide the rationale for alignment. Further, please indicate what, if any, programs or courses will be closed in its place, or how programs will be consolidated or re-packaged (e.g., why a new program is necessary, rather than revising an existing program).

- Program Area of Growth (an area of expansion)
- Program Area of Strength (capitalizes on existing strengths)

The Department of Art History offers several undergraduate programs in Art History (a Major and a Minor in Art History, and two combined programs with Studio Art and Film Studies, respectively) as well as an MA degree and a Doctoral degree, the latter of which is part of an inter-university program shared with the Université de Montréal, and the Université de Québec à Montréal. The Graduate Certificate in Curatorial Studies and Practices will complement these programs, all of which offer course content on issues relating to curation. The proposed program will impact most closely on the MA program, since 1 course (3 credits) of the Certificate will be drawn from MA course offerings (students in the Graduate Certificate may choose 3 credits of ARTH courses at the MA level). While students can pursue the Graduate Certificate independently of an MA or a PhD degree, it will serve as a complementary offering to those graduate students who are interested in developing expertise in curatorial issues as a means of gaining experience and knowledge relevant to this professional field.

The addition of the Graduate Certificate in Curatorial Studies to the Department of Art History's current offerings could result in an increase in the number of students within the MA in Art History by creating a bridge from undergraduate studies. Equally, MA graduates may decide to take the Graduate Certificate as an added specialisation to their MA studies. It is worth noting that students may and can enrol for the Graduate Certificate while in the MA History Art History program. At such time as there is a revision of the MA Art History program, consideration will be given to a more structured stacking of the Graduate Certificate within the MA.

Program Area of Growth

To offer this program, the Department will develop four new graduate-level courses. Three of the new courses (ARTH 676, ARTH 677 and ARTH 678) will be taught as part of the 12-credit Microprogram in Curatorial Studies (9 credits, 3 credits each). The remaining new 3-credit course (ARTH 679) constitutes the practicum required to complete the Graduate Certificate. These new courses will build on areas of expertise well established within the Department, as well as an existing internship course at the graduate level. Several faculty members have offered courses on targeted curatorial issues though this program will integrate these specialised classes into a focused curriculum.

The establishment of a 3-credit course that is specifically geared toward curatorial practices will build on existing internship course offerings in the MA program. This new course has the potential to strengthen existing community partnerships with Montreal institutions as well as to build new ties to community, and it will also give students the opportunity to develop their expertise in a more in-depth and intensive summer-long internship. A dedicated faculty supervisor of the 3-credit curatorial project course will foster connections with Montreal and Canadian institutions, which will have the potential to lead to further collaborations and possible employment opportunities for our students.

Program Area of Strength

The proposed Graduate Certificate in Curatorial Studies and Practices capitalises on existing scholarly, curricular, and administrative strengths of the Art History Department. Our MA program is one of the longest standing and leading graduate programs in Canada, noted for its strong focus on critical, contemporary, interdisciplinary, and community engaged approaches to the study of art. The Department boasts faculty with a wide range of research expertise, including those with expertise in curation and museology. Many of these faculty members currently teach courses on curatorial studies and practice in the context of Indigenous, Black, and Global Art Histories. They have supervised master's theses focused on curatorial issues and can serve as instructors and mentors in the Certificate program. Our department is situated within a rich research infrastructure that includes the Gail and Stephen A. Jarislowsky Institute for Studies in Canadian art, the *Journal of Canadian Art History*, the Canadian Women Artists History Initiative, and the Visual Collections

Repository. These provide ample opportunities for collaboration, mentorship, and professional networking. Given the strength of its current programs, the Art History Department is eager to develop this Graduate Certificate in Curatorial Studies and Practices to explore novel pedagogical design models, expand our internship capacity, and reach new student demographics.

6. Consultation (approx. 1 page):

- a. Describe the consultation processes that have been undertaken with potentially affected academic units and/or other stakeholders.

The Graduate Certificate in Curatorial Studies has been framed in consultation with the following members within and beyond Concordia University:

1. Dr. Annie Gérin, Dean, Faculty of Fine Arts
2. Dr. John Potvin, Chair, Department of Art History
3. Camille Pouliot, Department Coordinator, Department of Art History
4. Dr. Elaine Paterson, Associate Dean, Academic Programmes and Pedagogy, Fine Arts
5. Marie-Ève Marchand, Facilitator, Academic Affairs, Fine Arts
6. Christopher Cooke, Facilitator, Academic Programmes and Pedagogy
7. Dalia Radwan, Curriculum Developer, Centre for Teaching and Learning
8. Gina Beltran, Developer, Graduate Academic Programs, School of Graduate Studies
9. Dr. Rachel Berger, Associate Dean, Academic Programs and Development, School of Graduate Studies
10. Dr. Sandra Gabriele, Vice-Provost, Innovation in Teaching and Learning
11. Julie Johnston, Manager, Curriculum Innovation and Development, Office of the Provost and Vice-President

- b. Describe the impact the new program will have on other, existing programs.

We envisage that the proposed Graduate Certificate in Curatorial Studies and Practices will attract recent Art History, Art Education and Studio Arts graduates as well as graduates from Arts and Sciences courses (Anthropology, History, etc.) The program will be a complementary offering to those graduates interested in developing their skills in curatorial issues. The existing Art History program most impacted will be the MA program as 1 course in the proposed program will be chosen as an elective from the MA course offerings.

- c. Describe what further collaborations or partnerships, if any, are being developed in order to support the program, if any.

The Department of Art History has existing collaborations and partnerships with the FOFA Gallery, 4TH Space, the Leonard & Bina Ellen Art Gallery, the Jarislowsky Institute for Studies in Canadian Art, 60 x 60 amongst others which will prove invaluable in the courses offered in this program, particularly with the practicum offered in ARTH 679.

Students in the program will have access to the Elspeth McConnell Critical Curatorial Laboratory, a state-of-the-art facility focused on developing, teaching, and exhibiting innovative perspectives, techniques and technologies in curatorial work. The Lab will be the practical hub of activities for students in the Certificate program where museum-grade preservation, archiving, handling and exhibition practices can be learned. The facility will ensure that Concordia takes a leading national role to foster the next generation of Canadian curators. The Lab will provide technical help and materials to allow for hands-on, problem-solving training.

Students in the program will also be in regular contact with the activities of the new Concordia University Research Chair in Critical Curatorial Studies and Decolonizing Art Institutions (Tier 1, 2023-2028), Dr Alice Ming Wai Jim. This CURC may employ graduate research assistants from the program to assist in, for example, programming and bibliographic research on key curatorial modalities and hard lessons learnt from Black Lives Matter Hires, as well as a conference on global Asian diasporas in the 21st century.

Students in this Graduate Certificate will also benefit from our four active student research groups: the Concordia Undergraduate Journal of Art History; the Art History Graduate Students Association; the Ethnocultural Art Histories Research group (a group that extends beyond Concordia); and Yiara, a student-run, undergraduate feminist art publication. Student research groups such as the Art History Graduate Students Association and Yiara, will help in recruiting future students and welcome and retain current students in our programs.

The network of alumni employed in key positions at the McCord Museum, the Montreal Museum of Fine Arts, the Canadian Centre for Architecture, and many others will be of enormous value when introducing students of the program to the industry and in the organization of internships and will allow for lectures and workshops to be offered by industry experts, to forge links with industry experts and greatly benefit graduate students who will have the opportunity to discuss their projects with seasoned professionals.

7. Resources and Budget: Keeping in mind that the Fast Track Process is meant for programs that have minimal resource implications, please indicate if any resources are required to start the program. Please provide a detailed budget with rationale for each budget line.

(See **Appendix 7**)



Summary of Changes (New Graduate Program (Fast Track))

Regulation Changes:

- Admission Requirements Change
- Academic Regulations Change

REGULATIONS CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: Microprogram in Curatorial Studies

Calendar Section Name: Admission Requirements

Calendar Section Type: Regulation

Description of Change: Admission Requirements Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Calendar publication date: 2025/2026/Fall

Type of change: Regulation Change

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Fine Arts Programs > Art History Programs > Graduate Microprogram > Curatorial Studies

Present Text calendar

Admission Requirements

Proposed Text

Admission Requirements

- Bachelor's degree in museology art history, curatorial studies, visual arts, art education, cultural/history studies, or a related field.
- Alternatively, applicants with relevant professional experience, a non-traditional educational path or lived experience will be considered based on their application dossier.
- Proficiency in English: applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the English language proficiency page for further information on the requirements and exemptions.

Rationale:

Creation of admission requirements for this new program.

Resource Implications:

None.

PROGRAM CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: Microprogram in Curatorial Studies

Calendar Section Name: Graduate Microprogram in Curatorial Studies

Calendar Section Type: Program

Description of Change: Graduate Microprogram in Curatorial Studies
New

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Program Name:

Program Type: Course-based

Degree: Course-based

Calendar publication date: 2025/2026/Fall

Planning and Promotion: 01 Jan 0001

Effective/Push to SIS date: 01 Jan 0001

Implementation/Start date: 01 Aug 2025

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Fine Arts Programs > Art History Programs > Graduate Microprogram > Curatorial Studies > Degree Requirements

Type of Change: New Program

Present Text calendar

credits

0

Proposed Text

12 Graduate Microprogram in Curatorial Studies
credits

9 credits:
ARTH 676 Introduction to Curatorial Practices and Theory (3)
ARTH 677 Advanced Topics in Curatorial Practice and Theory (3)
ARTH 678 Exhibition Concept Design (3)

3 credits chosen from MA seminars within the department of Art History or from across the university with permission of the Graduate Program Director.

Rationale:

Degree requirements created for this new program.

Resource Implications:

There are minimal resource implications which have been reviewed and approved by the Dean of Fine Arts. See the budget (appendix 7) for more details.

REGULATIONS CHANGE FORM

Dossier Type: New Graduate Program (Fast Track)

Dossier Title: Microprogram in Curatorial Studies

Calendar Section Name: Academic Regulations

Calendar Section Type: Regulation

Description of Change: Academic Regulations Change

Proposed: Graduate Curriculum Changes

Faculty/School: Faculty of Fine Arts

Department: Art History

Calendar publication date: 2025/2026/Fall

Type of change: Regulation Change

Path: Graduate > See Summer 2024 Graduate Calendar > Programs > Fine Arts Programs > Art History Programs > Graduate Microprogram > Curatorial Studies

Present Text calendar

Academic Regulations Academic Regulations

Proposed Text

Academic Regulations Academic Regulations

1. **Academic Standing.** Please refer to the Academic standing section of the Calendar for a detailed review of the Academic regulations .

2. **Time Limit.** Please refer to the Academic regulations page for further details regarding the Time limits . It is expected that students will normally complete the microprogram within two terms.

3. **Completion Requirement.** To obtain a letter of attestation, students must have a cumulative GPA of 2.70.

Rationale:

Creation of Academic Regulations for this new program.

Resource Implications:

None.

Impact Report

Other Units

Addition of **Academic regulations** to **Academic Regulations** requirement

Source of other unit Impact

- Sub Section is housed in Academic regulations

Addition of **Time Limits** to **Academic Regulations** requirement

Source of other unit Impact

- Regulation is housed in Academic regulations

Addition of **Academic standing** to **Academic Regulations** requirement

Source of other unit Impact

- Regulation is housed in Academic regulations

Appendix 2: curriculum mapping

Learning Category/Aspects of Learning	Graduate Certificate in Curatorial Studies I: Introduced R: Reinforced M: Mastered	Semester 1 (Fall)	Semester 2 (Winter)		Semester 3 (Summer)	Main assessment methods
		Introduction to curatorial practice and theory (ARTH 676)	Advanced topics in curatorial practice and theory (ARTH 677)	Exhibition concept design (ARTH 678)	Curatorial project (ARTH 679)	
Critical Inquiry	1. Call into question and critically discuss historical and current trends in curatorial practice, theory, criticism, and community engagement as case studies and exemplars for	I	R	R	M	Contributing to peer discussions, reflective journal writing, reading responses, Research paper/Presentation
Critical Inquiry	2. Analyze and critique the conceptual, aesthetic, and ethical challenges of inclusive curatorial practices within a variety of institutional and non-institutional milieux.	I	R	R	M	Contributing to peer discussions, reflective journal writing, reading responses, Research paper/Presentation
Integration and Application	3. Develop a critical curatorial practice and apply their knowledge of the milieux to design an independent curatorial, public programming, educational, interpretive, evaluative, or research-based project.		I	R	M	Presentation; Completion of Exhibition Concept Design or other professional first deliverable.
Research skills	4. Research, identify, construct and evaluate arts programming that is consistent with the vision and mandate of organizations that promote decolonization efforts.	I	R	R	M	Research Paper; Group Discussions; Exhibition Concept Design; Peer Critique
Practice	5. Demonstrate an ability to realize a physical project in an advanced format that may be exhibited, installed, published, distributed, funded, enacted or activated in a reportable manner, and applying theoretical principles.	I	I	R	M	Realization of Exhibition Concept Project; Peer feedback; Experiential learning onsite
Metacognitive knowledge and lifelong learning	6. Develop strategies to define their own career objectives and understanding of the arts sector through building networks that will inform their professional goals while allowing them to practice advocacy skills on behalf of the arts they represent.	I	R	R	M	Realization of Final Exhibition Creation Project; Onsite experiential learning; Reflective journal

Appendix 3: sample syllabi

ARTH 676: Introduction to Curatorial Practice and Theory (3 credits) – sample syllabus

Prerequisite

None

Description

This seminar introduces the students to the histories and theories of curatorial practices in various local, national, and international contexts. It also explores a range of historical, social, economic, educational, ethical, legal, technological, and administrative issues concerning curation and various types of institutions. The course introduces both theoretical and historical aspects of curatorial practice from an array of perspectives, such as but not limited to Indigenous, Black, queer, feminist, and decolonial approaches, and methodologies such as cultural analysis, institutional critique, and activist interventions, to cite only a few examples. The choice of topics varies depending on the expertise of the faculty member.

Learning outcomes

By the end of the course, students will be able to:

- Discuss how the history and theories of curatorial practices affect current curatorial practices.
- Consider diverse perspectives including Indigenous, Black, queer, feminist, anti-oppression and decolonial approaches.
- Interpret diverse methodologies, including cultural analysis, critical race museology, institutional critique, and activist interventions, used in research-based curatorial practices.
- Engage in critical dialogue and contribute to current debates through thoughtful analysis and reflection, centering marginalized perspectives and challenging dominant narratives.
- Identify different professional skills including navigating donor and board relations, acquisitions, and collections as they relate to the implementation of policies and strategic plans.
- Examine the ethical considerations and responsibilities of curators in relation to representation, power, interculturality, accessibility, and cultural sensitivity.

Assessments

- Written assignments (essays, didactics, and reports)
- Projects (individual and/or group)
- Oral presentations (individual and/or group)
- Peer and self-assessments
- Participation and attendance

ARTH 677: Advanced Topics in Curatorial Practice and Theory (3 credits) – sample syllabus

Prerequisites

The following course must be completed previously: ARTH 676.

Description

This course integrates both theoretical and practical aspects of curatorial practice through a decolonized, inclusive, and sustainable lens. Curatorial engagements from an array of theoretical perspectives and methodologies such as cultural analysis, collaboration, institutional critique, performative interventions, and networked interactivity are investigated. Current debates concerning how exhibitions function as forms of research and knowledge production, as well as their ideological and social conditions are also examined. The choice of topics varies depending on the expertise of the faculty member.

Learning outcomes

By the end of the course, students will be able to:

- Critically assess key debates and contemporary issues in curatorial theory and practices.
- Analyze and critique the ways in which exhibitions contribute to knowledge generation within the field of curatorial studies, taking into account intersectional and decolonial frameworks.
- Use current trends in curatorial practice, theory, criticism, and community engagement as case studies and exemplars for contemporary practice.
- Develop a personal and well-informed perspective on the challenges and possibilities of curatorial work through a decolonized, inclusive and sustainable lens.
- Develop consultative capacities for navigating donor and board relations, acquisitions, and collections as they relate to the implementation of policies and strategic plans, amongst other skills.
- Articulate and communicate their critical insights effectively through presentations and written assignments.

Assessments

- Completion of curatorial assignments and projects
- Group critiques
- Oral presentations
- Reading and writing assignments
- Participation and attendance

ARTH 678: Exhibition Concept Design (3 credits) – sample syllabus

Prerequisites

The following course must be completed previously: ARTH 676. The following course must be taken concurrently or previously: ARTH 677.

Description

This course focuses on the research and planning process of a significant project that can be actualized in ARTH 679: Curatorial Project. In addition to developing practical professional skills for exhibition design, such as proposal preparation and budget management, students gain theoretical professional experience by drafting a prospectus or other first deliverable for the project and presenting this to the cohort to refine and strengthen the final work. The course takes advantage of projects, available spaces, planned cultural events or exhibitions taking place in any given year. Students become familiar with the diverse facets and various functions of a given professional environment on a theoretical level.

Learning outcomes

By the end of this course, students will be able to:

- Gain a comprehensive understanding of exhibition concept design principles, methodologies and of the diverse facets and functions within professional curatorial environments.
- Explore the roles and responsibilities of curators, exhibition designers, art handlers, educators, and other professionals involved in the exhibition process.
- Apply theoretical knowledge gained in the Curatorial Practice and Theory courses to practical curatorial contexts.
- Cultivate a professional mindset by engaging in project-based learning and developing deliverables for potential curatorial projects.
- Critically analyze and evaluate exhibition concepts through constructive peer critiques.

Assessments

- Projects (individual and/or group)
- Group critiques and case studies
- Oral presentations (individual and/or group)
- Participation and attendance

ARTH 679: Curatorial Project (3 credits) **– sample syllabus**

Prerequisites

The following courses must be completed previously: ARTH 676, ARTH 677, ARTH 678.

Description

Students carry out the project researched and planned in ARTH 678, allowing them to be involved from inception to completion. The goal of this practicum is to provide students with the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work. The hands-on experience and training are enabled through the supervision of the faculty teaching the course as well as the site supervisor. During the practicum course, students gain professional experience through the realization of a significant project.

Learning outcomes

By the end of this course, students will be able to:

- Create a physical project in an advanced format based on theoretical knowledge and principles within the curatorial field.
- Apply critical analysis and decision-making skills to address challenges and refine their curatorial project in a professional context.
- Cultivate relationships with, for instance, artists, curators, and build partnerships with lenders, sponsors, and institutions to support their curatorial project, including its funding, and their professional goals.
- Assess the impact and results of their curatorial project through peer and faculty feedback, evaluation methods, and critical self-reflection.
- Reflect on the ethical and social implications of curatorial choices and engage with diverse perspectives in the exhibition process.

Assessments

- Final curatorial project realization
- Group critiques
- Reflective journal
- Peer and self-assessments
- Site and Faculty Supervisor reports



Art History Practicum Agreement Form

ARTH 679 Curatorial Project

(3 credits)

Prerequisites:

1. Students must have completed: ARTH 676, ARTH 677, ARTH 678.
2. Written permission of the Supervising Professor teaching ARTH 679

Overview of agreement and monitoring:

The undersigned Professor and host institution supervisor have agreed to supervise the undersigned student for a professional practicum as part of ARTH 679. This is an opportunity for the student to experience a professional setting and to realize a curatorial project they have developed as part of the Microprogram in Curatorial Practices in the Department of Art History. Students may find a host institution for their practicum, or the faculty member teaching ARTH 679 will organize a placement. The Curatorial Lab at Concordia may also be used for the placement of students for their practicum.

As the practicum is highly individualized, the Supervising Professor will rely on the student to report any issue in the workplace. The Supervising Professor will check in with the host institution supervisor at least once during the practicum. It is the responsibility of the student to request a meeting to update any changes made to the original offer by the host organization.

The student and the Supervising Professor of ARTH 679 will meet:

- During the approval stage of the practicum proposal.
- To approve and clarify the syllabus determined by the Supervising Professor in conjunction with the student, including the expected learning outcomes (p.3), method of evaluation (see p.4), and schedule of meetings.
- At the midterm reporting of practicum progress (this may be done by email, Zoom or in person).
- At the completion of the practicum for assessing the value of the experience.

In addition, the Supervising professor will meet with the entire cohort of ARTH 679 students at least twice (towards the beginning and end of the summer) to present and discuss their practicum.

Number of hours:

The practicum will consist of between 150-200 hours for a 3-credit course.

Name of the student: _____

Student ID #: _____

Beginning and end date of practicum: _____

Estimated number of hours per week: _____

Name of the external supervisor: _____

Position: _____

Organization: _____

Address: _____

Telephone: _____

Email: _____

Practicum Course Description and Objectives:

ARTH 679: Curatorial Project (3 credits) [practicum]

- Students **carry out** the project researched and planned in the Microprogram in Curatorial Studies, allowing them to be involved from inception to completion.
- The goal of this practicum is to provide the student the hands-on opportunity to mobilize their theoretical training in a specific setting, as well as enable the development of a critical reflection on their practical work.
- The hands-on experience and training are enabled through the supervision of the faculty teaching the course as well as the site supervisor.
- During the practicum course, students gain professional experience through the **realization of a significant project.**

By the end of this course, students will be able to:

- Create a physical project in an advanced format based on theoretical knowledge and principles within the curatorial field.
- Apply critical analysis and decision-making skills to address challenges and refine their curatorial project.
- Cultivate relationships with artists, curators, lenders, sponsors, and institutions to support their curatorial project and professional goals.
- Assess the impact and results of their curatorial project through peer and faculty feedback, evaluation methods, and critical self-reflection.
- Reflect on the ethical and social implications of curatorial choices and engage with diverse perspectives in the exhibition process.

Note: these learning objectives may vary according to the faculty member teaching ARTH 679.

To be completed by the student in consultation with the External Supervisor.

Describe the organization and its principal activities:

Describe the principal tasks of the student (how the student's proposed curatorial project will be undertaken, duties, responsibilities):

The student agrees to work on the tasks described above under the supervision of the external supervisor and will complete a "mid-term report" questionnaire (to be signed by the external supervisor), as well as complete coursework as outlined by the faculty supervisor.

Payment:

Practicums may be paid or unpaid according to each individual practicum. Please circle if this practicum will be paid: **YES** **NO**



Final Submission and Assessments:

1. The final report:

- The complete document is required before grades can be assigned. The length of the report is a minimum of two pages.
- The final report must include the letter of assessment from the host institution Supervisor on the project realization and other practicum tasks.
- The text document must be of good quality with edits, spelling and grammar checks completed. All visual documentation must be formatted and of good quality.
- Any changes or modifications to the proposal agreement must be clearly stated in the report.
- The report must summarize:
 - a) What was gained from the experience including personal growth and technical and conceptual skills.
 - b) State the nature of the work environment including whether the involved teamwork, individual tasks or other.
 - c) Photos, screenshots, and other documentation may be submitted to show the environment and represent the completed project (with permission of the host institution Supervisor).

2. Site and Faculty Supervisor reports or letter of assessment

Assessment will include consideration of the realization of the final curatorial project planned and developed in ARTH 678. Assessment methods may vary according to the faculty member teaching ARTH 679, but may include the final curatorial project realization, group critiques, a reflective journal, peer and self-assessments, Site and Faculty Supervisor reports.

Role of the Host Organization:

The following provides general guidelines and conditions for organizations wishing to host a student. The host organization is responsible for the following:

- Review and approve the student's proposed curatorial project.
- Identify a staff person to act as the main contact for the Supervising Professor throughout the selection process and practicum and to supervise the student.
- Offer supervision to the student during the practicum: provide guidance on the work to be completed; offer feedback on their work; support successful completion of deliverables, in particular the student's project.
- Complete an assessment form regarding the quality of the work done by the student, the number of hours of the practicum and evaluating of the work done by the student, based on the expectations outlined in the job profile, the proposed curatorial project of the student and the actual outcomes.

Role of the Department of Art History:

The Department of Art History at Concordia University will provide the following in support of the student and host organization:

- The Supervising Professor (ARTH 679) will oversee and conduct the assessments.
- The Supervising Professor will assist the student in case of issues related to practicum activities to minimize the impact of errors. However, as this is a learning program, both parties must recognize that the students are still in training and that mistakes are inevitable.
- The Department of Art History and the host organization will jointly approve the scope of the practicum activities.
- As required, confidentiality of host organization information will be maintained as best as is practical. Students will be instructed prior to the practicum on how to deal with confidential information.

Information about the parties:

The Art History practicum is intended to operate as a partnership between two organizations: Concordia University and the host institution.

About the host institution:

[The host organization may provide a short statement about their work here]

Host institution contact(s):

[Please list the contact information of at least one person at the host organization responsible for supporting the intern, including full name, title, phone number, and email address]

Department of Art History contact:

Should the host organization have any concerns about the progress of the practicum, or wish to have any concerns alleviated, they may contact the following:

Graduate Programme Administrator
Department of Art History
Concordia University

Student Signature: _____

Date: _____

External Supervisor Declaration

The External Supervisor agrees that the above information is correct and will provide adequate training and feedback to the student in order for them to complete their tasks.

Signature of External Supervisor: _____

Date: _____

Signature of Graduate Program Director: _____

Date: _____

Signature of Department Chair: _____

Date: _____





February 12, 2024

To: Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dr. Potvin,

I write to endorse the development of a Graduate Certificate in Curatorial Studies and Practices, and a Microprogram in Curatorial Studies at Concordia University.

In my capacity as Deputy Director at the Musée d'art contemporain de Montréal (MAC), I recognize the importance of integrating rigorous curatorial scholarship with practice. The MAC is undergoing a major transformation project to meet the urgent call for cultural institutions to innovate and assume a more socially responsive role. We are deeply invested in practices that champion inclusivity, community engagement, and tangible steps towards decolonization. Consequently, there is a pressing need for curatorial professionals who are proficient in driving dialogues and actions within this context.

My roles as Director and Curator at Concordia's FOFA Gallery (2014-2019) and as Director at Concordia's Office of Community Engagement (2019-2020) have provided me with firsthand insight into the Faculty of Fine Arts' commitment to experiential learning. This commitment to practical experience is what propels graduates into meaningful careers in the museum and wider cultural sectors.

I see the following as key strengths of the proposed programs:

- The flexibility for students to choose the pathway of study – graduate certificate or microprogram – that best addresses their profile and needs.
- The focus on sustainable and decolonized practices; areas that are omitted from many other similar programs.
- The way the admissions requirements open up opportunities for non-traditional learners, i.e. by recognizing previous lived experiences.
- The highly practical nature of the internship during which students have the opportunity to apply the skills they have developed during the program.
- The inclusion of an elective course that allows students to incorporate an area of their own interest.



- Concordia's Department of Art History as a uniquely valuable site in terms of its facilities (Curatorial Lab, FOFA Gallery, etc.) and its relationships with art institutions in Quebec.

I welcome the opportunity to discuss how the MAC might collaborate with the Department of Art History to advance our shared objectives.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Jennifer Dorner, Deputy Director
Musée d'art contemporain de Montréal
Cell : 514-441-6171
Email : jennifer.dorner@macm.org

February 19, 2024

Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Subject: Letter of support for the Graduate Certificate in Curatorial Studies and Practices and Microprogram in Curatorial Studies at Concordia University.

Dear Dr. Potvin,

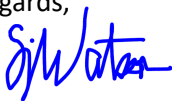
La Guilde and Concordia University's Department of Art History share a commitment to supporting research and exhibitions devoted to contemporary craft and Indigenous art practices in Canada. La Guilde is situated in proximity to Concordia University and offers a number of job training and mentorship opportunities for students in the areas of exhibition development, contemporary art research, and permanent collection conservation. La Guilde commits to becoming a community partner for the certificate and microprogram.

Given our shared interest in expanding the presentation of Indigenous artists' work, La Guilde would equally support and engage with the program focus on sustainable and decolonized practices; areas that are not a feature in other programs and necessary to the local and national educational context. La Guilde mentors and trains undergraduate and graduate students throughout the year in best practices for art presentation and artist support. As such, we are deeply interested in the highly practical nature of the internship aspect of this program and have numerous experiential learning opportunities for students and graduates of the new programs.

We would be very happy to discuss the possibility to offer internship opportunities to practicum students within our institution.

Please do not hesitate to contact me if you have any questions.

Kind regards,



Sarah Watson

Executive Director
direction@laguilde.com

To: Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dr. Potvin,

On behalf of the Musée d'art contemporain de Baie-Saint-Paul, I am writing this letter to express my support for the development of a Graduate Certificate in Curatorial Studies and Practices, and a Microprogram in Curatorial Studies at Concordia University.

I offer workshops on the art market and how to establish the value of a work of art with the ArtVolt program since its foundation. I am always amazed by the innovative approach that enables students and alumni to learn a great diversity of skills needed to navigate the complexities of the art world. It is distinctly built around practical aspects that are key to the development of their artistic careers. In my opinion, it could play an essential role for young art historians and really support their growth as professionals.


I see the following as key strengths of the proposed programs:

- The flexibility for students to choose the pathway of study – graduate certificate or microprogram – that best addresses their profile and needs.
- The focus on sustainable and decolonized practices; areas that are omitted from many other similar programs.
- The way the admissions requirements open up opportunities for non-traditional learners, i.e. by recognizing previous lived experiences.
- The highly practical nature of the internship during which students have the opportunity to apply the skills they have developed during the program.
- The inclusion of an elective course that allows students to incorporate an area of their own interest.
- Concordia's Department of Art History as a uniquely valuable site in terms of its facilities (Curatorial Lab, FOFA Gallery, etc.) and its relationships with art institutions in Quebec.

We would be very happy to discuss with your team the possibility to offer internship opportunities to practicum students within our institution.

Please do not hesitate to contact me if you have any questions.

Regards,



Gabrielle Bouchard
Director and chief curator
Musée d'art contemporain de Baie-Saint-Paul



Centre des arts visuels
Visual Arts Centre

350 avenue Victoria
Montréal (Québec) H3Z 2N4

514-488-9558 info@centredesartsvisuels.ca
www.centredesartsvisuels.ca

Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

January 26, 2024

Dear Dr. Potvin,

On behalf of the McClure Gallery and The Visual Arts Centre, I am writing this letter to express my support for the development of a Graduate Certificate in Curatorial Studies and Practices, and a Microprogram in Curatorial Studies at Concordia University.

I am currently an Affiliate Assistant Professor in the Department of Art History, as well as a former student (MA, 2010, BFA, 2008). Given my experience with the Department, I see the following as key strengths of the proposed programs.

First, I see a tremendous benefit for students to apply practically their research undertaken in the Art History Department, with its focus on sustainable and decolonized practices; areas that are omitted from many other similar programs. As a student, this was one of the key reasons I chose Concordia and I'm happy to see the new ways in which the Department is furthering the commitment to hands-on application through practical internships and skill building. I also see benefits for students within the structure of the program, namely, the flexibility for students to choose the pathway of study – graduate certificate or microprogram – that best addresses their profile and needs. Finally, as a student who worked full time throughout my degrees, I appreciate the way these programs align the admissions requirements and open up opportunities for non-traditional learners, i.e. by recognizing previous lived experiences.

We would be very happy to discuss with your team the possibility to offer internship opportunities to practicum students within our institution. Please do not hesitate to contact me if you have any questions.

Regards,


Amber Berson, PhD
Executive Director
Centre des arts visuels | Galerie McClure

PIERRE-FRANÇOIS OUELLETTE ART CONTEMPORAIN

www.pfoac.com

963 Rachel est, Montréal

 PFOAC

 @galeriepfoac

Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

Dear Dr. Potvin,

I am writing this letter to express my support for the development of a Graduate Certificate in Curatorial Studies and Practices, and a Microprogram in Curatorial Studies at Concordia University.

Created in 2001, Pierre-François Ouellette art contemporain in Montreal has worked closely with faculty members, students and alumni from Concordia University. We represent three artists with strong links with Concordia's Department of Art History, August Klintberg (formerly known as Mark Clintberg, PhD 2013 Concordia) currently Associate Professor in the School of Critical and Creative Studies at the Alberta University of the Arts, John Latour (M.A. Art History Concordia) currently Teaching & Research Librarian - Fine Arts and Adad Hannah (Doctor of Philosophy (Ph.D.) Art History and Fine Arts. 2013). We have help Professor Tracy Valcourt with comments about her planned course last semester, ARTH 387: Issues in Art and Criticism: Spaces of Critique: Museums, Social Media, Magazines.

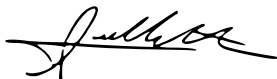
I see the following as key strengths of the proposed programs:

- The flexibility for students to choose the pathway of study – graduate certificate or microprogram – that best addresses their profile and needs.
- The focus on sustainable and decolonized practices; areas that are omitted from many other similar programs.
- The way the admissions requirements open up opportunities for non-traditional learners, i.e. by recognizing previous lived experiences.
- The highly practical nature of the internship during which students have the opportunity to apply the skills they have developed during the program.
- The inclusion of an elective course that allows students to incorporate an area of their own interest.
- Concordia's Department of Art History as a uniquely valuable site in terms of its facilities (Curatorial Lab, FOFA Gallery, etc.) and its relationships with art institutions in Quebec.

We would be very happy to discuss with your team the possibility of offering internship opportunities to practicum students within our institution.

Please do not hesitate to contact me if you have any questions.

With best regards,



Pierre-François Ouellette

: Director

daphne

To: Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8

daphne
103, 5425 av Casgrain,
Tiohtià:ke / Montreal, QC H2T 1X6

Dear Dr. Potvin,

On behalf of daphne (Centre dart daphne), Tiohtià:ke's first Indigenous-determined artist-run centre, I am writing this letter to express my support for the development of a Graduate Certificate in Curatorial Studies and Practices, and a Microprogram in Curatorial Studies at Concordia University.

My previous relationship with Concordia's Department of Art History at both the undergraduate and graduate levels was an enriching experience. I fondly remember Professor Sandra Paikowsky setting assignments that opened a space for us to curate imagined (in my case feminist) art exhibitions. While it was only after I was in the process of a doctorate in Art Education I began my curatorial work. This step into curation, came out of the world that I had created around myself from my undergrad days and the accompanying experiences of museums, galleries and artist-run centres.

My on-going work in artist-run centres over time, and now at daphne has furthered my knowledge of curating as well as the day-to-day workings of an arts administrator. Even more importantly, this work has made me recognize the importance of training the next generation of cultural workers.

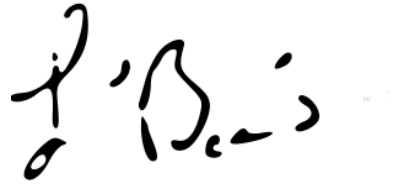
I see the following as key strengths of the proposed programs:

- The flexibility for students to choose the pathway of study – graduate certificate or microprogram – that best addresses their profile and needs.
- The focus on sustainable and decolonized practices; areas that are omitted from many other similar programs.
- The way the admissions requirements open up opportunities for non-traditional learners, i.e. by recognizing previous lived experiences.
- The highly practical nature of the internship during which students have the opportunity to apply the skills they have developed during the program.
- The inclusion of an elective course that allows students to incorporate an area of their own interest.
- Concordia's Department of Art History as a uniquely valuable site in terms of its facilities (Curatorial Lab, FOFA Gallery, etc.) and its relationships with art institutions in Quebec.

We would be very happy to discuss with your team the possibility of offering internship opportunities to Indigenous practicum students at daphne.

Please do not hesitate to contact me if you have any questions.

Best Regards,

A handwritten signature in black ink, appearing to read "Lori Beavis". The signature is fluid and cursive, with the first name "Lori" written in a larger, more prominent script than the last name "Beavis".

Lori Beavis,
daphne, Executive Director



Montréal, le 1er février 2024

Monsieur John Potvin Ph.D.
Directeur du département d'histoire de l'art
Université Concordia
1515, rue Sainte-Catherine Ouest
Montréal (Québec) H3H 1M8

Objet : Lettre d'appui pour la création d'un diplôme de deuxième cycle en études et pratiques curatoriales (Curatorial Studies and Practices)

Cher Monsieur Potvin,

C'est avec un grand intérêt que je vous sou mets cette lettre d'appui pour la création d'un programme de deuxième cycle en études et pratiques curatoriales au sein de votre département. Depuis 2021, je suis responsable de la Collection Loto-Québec, emploi qui m'amène à travailler en étroite collaboration avec des artistes et à réaliser des expositions.

Mon profil de carrière est davantage celui d'une muséologue. Au fil des ans, j'ai côtoyé des historiens de l'art, des conservateurs ainsi que des commissaires avec lesquels j'ai conçu divers projets. Je suis d'avis que la mise sur pied d'un tel programme me permettrait d'être mieux outillée pour analyser des œuvres en art actuel et contemporaines et pour faciliter ma compréhension de leur contexte de création et ce, sans avoir à compléter à nouveau un diplôme de premier cycle.

L'avantage d'un tel programme est d'offrir aux professionnels, occupant un emploi régulier, la possibilité de se perfectionner tout en profitant d'une flexibilité qui allie le travail et les études. Par ailleurs, il s'agit d'une occasion permettant la rencontre et les échanges entre les travailleurs, les chercheurs et les étudiants du milieu artistique et culturel pour mieux comprendre les enjeux entourant la décolonisation des pratiques de conservation et pour favoriser l'inclusion.

À cet effet, Loto-Québec songe éventuellement à diversifier sa Collection et à l'enrichir de nouvelles acquisitions afin qu'elle reflète mieux les pratiques et l'ensemble de la création artistique québécoise



d'aujourd'hui. Votre programme serait donc bénéfique d'un point de vue personnel et professionnel mais également pour mon employeur.

Souhaitant que ma lettre trouve écho au sein de votre département.

Cordialement,

A handwritten signature in black ink, appearing to read "Manon Pouliot".

Manon Pouliot
Conseillère en projets culturels et en partenariats
Collection Loto-Québec



FOFA Gallery
Concordia University
EV 1.715, 1515 Ste-Catherine W
Montreal, QC H3G 2W1

April 4, 2022

Dr. John Potvin
Department Chair, Art History
Concordia University
1515 Ste. Catherine West
Montreal, QC H3H 1M8
John.potvin@concordia.ca

Dear Dr. Potvin

On behalf of the FOFA Gallery, I am writing this letter to express my enthusiastic support for the development of a Graduate Certificate in Curatorial Studies and Practices at Concordia University. A space dedicated to innovation, FOFA Gallery fosters and facilitates pedagogical inquiries, curatorial experiments, cutting-edge artistic practices and training opportunities. I believe that the plan to offer a certificate in Curatorial Studies and Practices is a timely and innovative initiative, and one that will surely contribute to the evolving dialogues around curatorial practice today.

Through FOFA Gallery's mandate to support the work of Concordia Faculty of Fine Arts students, faculty, staff and alum, I have had the chance to work with a range of practitioners connected to the University. It is clear that there is consistent interest on the part of artists, staff, interns, and visitors to explore curatorial practice and methodologies, as well as increasing demand for hands-on practical training in this field. I have often found that my background in curatorial work both in museums and as an independent curator has been a valuable asset in the mentorship and learning that happens at the Gallery. I foresee great potential for the Gallery to expand its teaching/training in this area and would welcome the opportunity to develop additional opportunities for student learning here.

As an alum of Concordia's Art History program (MA 2011), I can also personally attest to the suitability of Concordia University to host a program of this nature. During my studies, I was not only exposed to rigorous critical dialogue on curatorial practice and writing through some of my coursework, but also had the opportunity to immerse myself in Montreal's vibrant art scene. Through this, I was able to benefit from exposure to an extended and diverse network of museums, artist-run spaces, and galleries, as well as career opportunities that further shaped the evolution of my practice. I can imagine that a program focused on professional development, skills training, and experiential learning opportunities,

such as the one being proposed, would offer an excellent springboard for those wishing to pursue work in the cultural sector – here and across Canada.

Please do not hesitate to contact me if there are any questions about the FOFA Gallery and our wholehearted support for this initiative.

Sincerely,

A handwritten signature in black ink, appearing to read 'Nicole Burisch', with a stylized, cursive script.

Nicole Burisch
Director, FOFA Gallery
nicole.burisch@concordia.ca

FONDERIE DARLING
745, RUE OTTAWA,
MONTREAL (
QUEBEC) CANADA
H3C 1R8 T
514.
392.1554

FONDERIEDARLING.ORG

Montreal, August 11th, 2022

Dr. John Potvin
Department Chair, Art History
Concordia University
1515 St. Catherine Street W.
Montreal, QC H3H 1M8

Dr. John Potvin,

I am writing this letter to extend my support for the proposed Curatorial Certificate at Concordia University. As a long-time curator, founder and artistic director of visual-arts venue Fonderie Darling, I testify to the essential role curators play in supporting the creation, production, and dissemination of contemporary art by linking emergent artistic practice to the broader public.

The role of cultural institutions is constantly adapting in response to relevant critical social issues put forth through contemporary artistic practice. With the assertion of new theories and values come new modes of curating, and the role of the curator increasingly adopts a wider and wider range of practices. The diversity of the proposed Curatorial Certificate is a powerful reflection of the field itself, and this access to a broad range of relevant knowledge will have a critically positive impact on the next generation of curators.

Bridging the gap between theoretical scholarship and experiential knowledge, a Curatorial Certificate program will equip students with the practical strategies necessary to shape artistic discourses as they relate to their own communities. The program would also be an invaluable means of enriching their professional networks, and in turn generate new cooperative relationships between artists, cultural institutions, and broader publics, in which they will serve as the necessary link.

Concordia University's Faculty of Fine Arts holds the resources, professors, and networks to generate a lively and extensive Curatorial Certificate, and I strongly believe that the creation of such a program would advance both curatorial and critical practices within the arts.



Kind Regards,

Caroline Andrieux
Fondatrice et directrice artistique

31 March 2022

Dr. John Potvin,
Chair, Department of Art History
Concordia University, EV.3.809
1455 de Maisonneuve Blvd. W.,
Montreal, Quebec, H3G 1M8

Re: Endorsement for new Graduate Certificate in Curatorial Studies and Practices

Dear Dr. Potvin,

I am writing to express my support for the new Concordia University Graduate Certificate in Curatorial Studies and Practices. For students interested in pursuing careers as curators and cultural workers, being fluent in art history and theory simply does not suffice. Curating is a practice that requires an ability to simultaneously navigate complex cultural, economic, personal, and political relationships. The new Graduate Certificate will be essential in helping students bridge the gap between their knowledge of contemporary art and the environment in which it exists.

From both personal and professional experience, I can attest to the need for a program in Curatorial Studies and Practices that exists in Montreal. While completing my BFA in Art History at Concordia University, I was fortunate to be a member of the Institute for Co-operative Education. As a co-op student I benefited from experiential learning that taught me the real-life applications and limitations of my academic training. While interning at SBC Gallery of Contemporary Art, I worked closely with the then Director/Curator Pip Day. Being able to take a curatorial project from conception to creation with an experienced curator was an educational experience like no other. I can think of no better way to learn the true artistic and community stakes of curatorial practice.

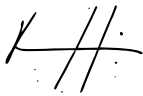
Not only a training opportunity, these internships were also how I began to build a professional network that continues to support my career. I was eventually hired at SBC Gallery before moving to Toronto to pursue a MFA in Criticism & Curatorial Practice at OCAD University. While in Toronto, my connections at SBC Gallery facilitated my employment at Gallery TPW where I worked during my studies. I was able to accumulate significant professional experience by the time I completed my MFA and was hired at La Centrale galerie Powerhouse shortly after graduating. I credit my smooth transition into full-time employment with the professional experience and network I gained as a co-op student.

Today, La Centrale regularly receives internship requests from students and recent graduates specifically seeking experience in the programming and curatorial side of our operations. In the last years the chasm between Canada's cultural institutions and the publics they are meant to serve has become increasingly clear. In order to keep these institutions relevant, we need practitioners who can not only envision new models of curatorial practice, but have the tools and training to make these new configurations possible. It is a challenging time for cultural institutions and we understand the need to properly train emerging scholars and cultural organizers. With the support of community partners like La Centrale, I am hopeful that the Graduate Certificate in Curatorial Studies and Practices will help this new generation rise to the occasion.

In addition to being a timely and necessary contribution to the Montreal and Canadian arts sector, I am confident that the new program's leadership will make it truly exceptional. As a student at Concordia I knew Professor Jim as a Professor and as Research Chair in Ethnocultural Art Histories. As a cultural worker, I know Professor Jim as an active and respected member of Montreal's arts community. The community support and professional network that Professor Jim brings with her will make it possible to turn academic discussions into experiential learning opportunities. The program's potential to turn theory into practice will also turn students into professionals.

It is with great excitement and optimism that I support the Graduate Certificate in Curatorial Studies and Practices, thank you for taking the time to consider my endorsement. I look forward to the possibility of working with the next generation of curators and cultural workers shaped by the new program.

Sincerely,



Mattia Zylak

General Co-Director & Operations, La Centrale galerie Powerhouse
MFA Criticism & Curatorial Practice, OCAD University '20
BFA Art History, Concordia University '18



From:
Michèle Thériault
Director
Leonard & Bina Ellen Art Gallery
Concordia University

To: John Potvin
Department Chair, Art History
Faculty of Fine Arts

Letter in support of the planned Graduate Certificate in Curatorial Studies and Practices

I am happy to see that Concordia is instituting a graduate program in curatorial studies and I support its creation. I remember being involved in discussions with faculty 10 years ago to set up a masters in the same field and later being invited at UQAM to reflect with others on the possibility of creating a curatorial studies degree there also. It is thus a welcome addition to the cultural field as articulated by the Faculty of Fine Arts. The Ellen Gallery has been at the forefront of the discourse on critical curatorial thinking in Montreal for many years now through its experimental exhibition formats and display strategies, public programming, critical texts, and digital archival fonds. It is thus welcome news that the Faculty of Fines Arts is planning this new program. I think that the gallery will be an asset that will enhance this new program and will be a significant resource for students (as well as an attraction point for recruitment), faculty and guests that will be invited to teach in this certificate. We are thus thrilled that we can be part of this new disciplinary adventure and fully support its coming into being.

Cordially,

Michèle Thériault
General and Artistic Director
michele.theriault@concordia.ca

Montréal, le 20 avril 2022

Dr. John Potvin, président
Université Concordia
Département d'histoire de l'art, EV.3.777
1455, boul. de Maisonneuve O.,
Montréal, Québec, Canada, H3G 1M8

Bonjour,

C'est avec beaucoup d'enthousiasme que j'appuie les démarches du Département d'histoire de l'art de l'Université Concordia à mettre sur pied un certificat d'études supérieures en études et pratiques curatoriales. En tant que chef des expositions et des publications au Musée d'art contemporain de Montréal, où je gère une équipe de conservateurs, de chargées de projets, d'un éditeur et d'un responsable d'action culturelle, je peux témoigner de l'importance d'avoir un tel programme pour les étudiant.e.s qui souhaitent faire carrière au sein du milieu de l'art contemporain.

Les programmes en études et pratiques curatoriales existent depuis des décennies à travers le monde et ont contribué de façon significative à élargir et faire évoluer nos façons de réfléchir le rôle du musée au 21^e siècle, l'exposition comme lieu de recherche et de production de savoir, de dialogue et d'échange avec divers publics. Le rôle du commissaire est devenu par le fait même plus complexe, mais aussi plus important et fascinant.

Il y a un manque flagrant au Québec pour ce type de programme qui viendrait compléter les programmes en histoire de l'art, en muséologie, en culture visuelle et matérielle, et en pratique des arts existants. Des programmes similaires existent à travers le pays, et ce depuis longtemps, et ils ont servi à former des générations de commissaires indépendants, et de conservateurs de musées, galeries et centres d'art. Ces programmes ont tout particulièrement facilité la formation de commissaires autochtones et de la diversité.

Le contexte montréalais est unique en raison de son bilinguisme, de ses quatre universités qui offrent des programmes en histoire et en pratique des arts et du dynamisme du milieu de l'art contemporain ; notre ville est donc un point d'encrage parfait pour former nos commissaires du futur, mais aussi pour forger des échanges et des dialogues nationaux et internationaux à partir d'ici.

Le Musée d'art contemporain de Montréal, le plus vieux et plus important musée d'art contemporain au Canada accueille régulièrement des stagiaires en histoire de l'art et en muséologie, tant des universités montréalaises que de l'étranger, et un pourcentage significatif souhaite œuvrer au sein des départements de la conservation et l'éducation, et plus particulièrement en tant que conservateurs d'expositions. Actuellement les étudiant.e.s qui veulent poursuivre leur formation en études curatoriales doivent quitter Montréal, et malheureusement,

plusieurs ne reviennent pas. La proposition de forme hybride, qui faciliterait la formation d'étudiant.e.s à distance, permettrait aussi de créer des échanges et des dialogues qui sont si essentiels à notre profession.

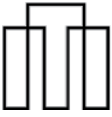
La Faculté des beaux-arts de Concordia est l'une des écoles d'art, de performance et de design les plus complètes au pays. Elle a un large soutien communautaire, des réseaux professionnels et des contacts internationaux nécessaires pour créer un programme des plus dynamiques. L'expertise pratique, théorique, scientifique et communautaire des membres du corps professoral du Département d'histoire de l'art est vaste. Elle couvre des domaines d'intérêt stratégique étroitement liés au projet de certificat : diversité, inclusion, modes de connaissance autochtones, pratique sociale, engagement communautaire, activation des archives, précédents historiques, critique institutionnelle, programmes éducatifs inclusifs, analyse de la culture matérielle, production et diffusion médiatiques, design d'expositions et de structures interprétatives et plus encore.

En conclusion, j'appuie très fortement la création de ce programme d'études et pratiques curatoriales, et, je crois fermement que la Faculté de beaux-arts de Concordia est l'institution idéale pour le faire.

Très sincèrement,

A handwritten signature in black ink, appearing to read 'Lesley Johnstone', written over a light grey rectangular background.

Lesley Johnstone
Chef des expositions et des publications
Musée d'art contemporain de Montréal
Lesley.johnstone@macm.org



Dr. John Potvin, président
Université Concordia
Département d'histoire de l'art, EV.3.777
1455, boul. de Maisonneuve O.,
Montréal, Québec, Canada, H3G 1M8

Objet : Lettre de soutien pour un certificat d'études supérieures en études et pratiques curatoriales à l'Université Concordia

Dr. John Potvin,

À titre de conservatrice des collections du Musée d'art de Joliette, j'appuie sans hésitation l'initiative d'implanter un certificat d'études supérieures en études et pratiques curatoriales au sein de l'Université Concordia.

Au tournant du 21^e siècle, au moment d'amorcer mes études de premier cycle en histoire de l'art, l'unique ville où il était possible d'obtenir une formation en études curatoriales était Toronto. Ce domaine professionnel, qui a pris énormément d'ampleur depuis les années 1990, est devenu aujourd'hui une dimension fondamentale de la carrière de l'historien-ne de l'art, ayant même supplantée l'autorité du critique d'art. Le rôle du commissaire est sans aucun doute la voie la plus prisée dans le domaine de l'histoire de l'art et ce tournant s'observe auprès des jeunes étudiant-e-s. Depuis 20 ans, quelques universités à travers le pays ont embrassé cette direction et l'Université Concordia devrait définitivement en faire de même. Elle serait d'ailleurs la seule institution anglophone à offrir un tel programme à Montréal.

En m'appuyant sur ma propre expérience professionnelle dans le milieu de la diffusion de l'art dans les centres d'artistes et les Musées d'ici, j'ai constaté que les jeunes en cours de formation ou diplômé-e-s en histoire de l'art expriment un vif intérêt pour le commissariat d'exposition. Au département des collections du Musée d'art de Joliette, la plupart des stagiaires que nous accueillons manifestent le désir d'en apprendre davantage sur l'organisation d'expositions même si leur stage concerne davantage la recherche dans le sillon des récentes acquisitions. Cela démontre à quel point les étudiant-e-s souhaitent ajouter à leur parcours des expériences valides et concrètes dans ce champ d'expertise.

Offrir des cours de commissariat est une nécessité pour refléter l'évolution de l'intérêt des chercheur-e-s, mais aussi des étudiant-e-s qui s'efforcent plus souvent qu'autrement d'acquérir une expérience en organisation d'expositions par le biais d'initiatives moins officielles et souvent en parallèle à leur cheminement académique. Un tel certificat pourrait contribuer à offrir aux étudiant-e-s des outils

et des connaissances pointues en la matière, à améliorer le niveau des projets d'exposition commissariés et à favoriser leur chance de succès sur le plan professionnel.

Parallèlement à mon emploi au Musée de Joliette, je suis doctorante au Département d'histoire de l'art de Concordia sous la supervision de la professeure Alice Ming Wai Jim. Ma thèse s'inscrit dans le domaine des études sur les expositions et focalise sur les expositions nationales en art contemporain et tout particulièrement sur celles de l'Inde. Le nouveau champ de recherche historique en études des expositions témoigne de l'importance grandissante accordée aux expositions et au rôle du commissaire depuis les dernières décennies à l'échelle planétaire.

Je suis fière de dire haut et fort que l'Université Concordia est à l'avant-garde de la production artistique au Canada, que ce soit du point de vue théorique ou pratique. Au cours des dernières années, le Département d'histoire de l'art a travaillé à accroître l'inclusion en s'assurant d'élargir l'expertise et la provenance culturelle de ses professeur-e-s. Cette situation audacieuse, qui est tout à son avantage, pourrait facilement être mise à profit dans ce programme d'études supérieures. Avec son corps professoral au profil tant historique que contemporain, le département a donc déjà tout en main pour jouer un rôle énorme dans ce domaine très dynamique.

Dans l'espoir que ce nouveau tournant soit entrepris par le département afin de remédier à cette lacune dans le cursus universitaire et d'être le reflet de l'évolution du monde de l'art actuel, je vous transmets mes vœux les plus sincères.

Cordialement,



Julie Alary Lavallée

Conservatrice des collections du Musée d'art de Joliette et
Doctorante en Philosophie au Département d'histoire de l'Art de l'Université
Concordia



John Potvin

Directeur

Département d'histoire de l'art

Université Concordia, Montréal

Objet: Lettre d'intérêt pour le programme en commissariat

Cher M. Potvin,

Le Musée Colby-Curtis accueille avec enthousiasme la volonté du département d'histoire de l'art de l'Université Concordia de créer un programme court en commissariat. Le Musée est toujours à la recherche de jeunes talents pour apporter un soutien à son programme d'expositions et il se fera un plaisir d'offrir des opportunités de stages aux étudiants et diplômés de votre programme.

Merci de me tenir au courant des développements de cette initiative!

Salutations cordiales,

Samuel Gaudreau-Lalande

Directeur-conservateur

Musée Colby-Curtis, Stanstead

Montréal, le 31 mars 2022

Prof. Alice Ming Wai Jim
Concordia University Research Chair in Ethnocultural Art Histories
1455 de Maisonneuve Blvd. W.,
Montreal (Quebec) H3G 1M8

Objet : Lettre de soutien au développement d'un certificat d'études supérieures en études et pratiques curatoriales au département d'histoire de l'art de l'Université Concordia.

Professeure Alice Ming Wai Jim,

Je vous écris pour signifier l'intérêt et le soutien du centre d'artistes OBORO dans le développement d'un certificat d'études supérieures en études et pratiques curatoriales au département d'histoire de l'art de l'Université Concordia.

L'approche proposée par le département de l'histoire de l'art de l'Université Concordia correspond tout-à-fait aux enjeux que vivent les organisations artistiques et muséologiques comme la nôtre, et plus largement la société. Les axes stratégiques orientant la prestation du certificat : la diversité, l'inclusion, les modes de connaissance indigènes, la pratique sociale, etc., sont essentiels à la compréhension du contexte professionnel où exerceront ces futur.e.s travailleur.euse.s culturel.le.s.

Après une vaste professionnalisation du milieu culturel dans les dernières décennies, il est essentiel que les pratiques curatoriales ouvrent leur porte à une pluralité de parcours qui enrichiront les réflexions et les manières de faire. Le milieu culturel fait face à de nombreux défis et il est primordial que les travailleur.euse.s de demain reçoivent une solide formation qui leur permettront d'innover et d'apporter de nouveaux regards et de nouvelles pratiques. La structure proposée par le certificat, visant à développer le développement professionnel, l'acquisition de compétences et les possibilités d'apprentissage par l'expérience tout en permettant un parcours personnalisé et en accueillant un public varié, nous semble offrir une excellente approche.

Nous espérons que ce certificat verra le jour. Veuillez recevoir, Professeure Jim, mes salutations sincères.



Marianne Breton (elle/she)
Directrice générale

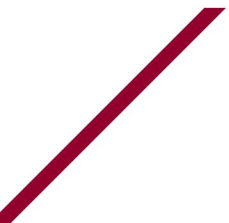
OBORO
4001, rue Berri, porte 301
Montréal (Québec) H2L 4H2



**GRADUATE CERTIFICATE IN
CURATORIAL STUDIES AND PRACTICES**

MARKET ANALYSIS REPORT

JUNE 2023



INTRODUCTION

The present report details the job profile, required skills, past employment trends and projected employment prospects for curators. It is divided into three sections:

- Employment outlook in Canada
- Employment outlook in the US
- Job posting in Canada (2018-2023)

The data has been gathered from the Government of Canada labour resources and the US Bureau of Labor Statistics.¹ The job posting analytics section is a report produced by Lightcast, which collects information from job postings published online across the country. Since curation is a specialized field and not all job opportunities are listed online, the data may not entirely represent the curatorial job market. This is particularly true for Quebec since Lightcast does not collect data from job postings published in French. However, the data has been included to provide an overview of the online curatorial job market in Canada.

KEY FINDINGS

- Curation is a growing employment field in North America with a moderate to good growth rate projected in Canada over the next 3 and 10 years, and a 14 percent overall growth projected in the US.
- In Canada, the media salary for a curator-director is \$47.69 per hour while the median salary for a curator is \$21.75. In the US the median salary for curators is \$60,110 per year.
- Based on the 312 curator job postings published online in the past 5 years, the top job titles are museum curator, curator, art curator and gallery curator.
- The 312 job postings correspond to 127 different employers out of which colleges, universities and professional schools are the main employers. The median salary advertised is \$54,900 per year.
- The main general skills advertised in job postings are research, collections, writing, planning and management. The main specialized skills are curation, exhibitions, art history, museum studies and fundraising.
- Most of the job opportunities for curators posted online are in Ontario (Toronto) and BC (Vancouver and Burnaby).

¹ The Government of Canada labour resources include the [National Occupation Classification \(NOC\)](#) system, the [Canadian Occupation Projection System \(COPS\)](#) and [Opportunext](#). The US Bureau of Labor Statistics resources include the [Occupational Outlook Handbook](#) and the [Quarterly Census of Employment and Wages](#).

EMPLOYMENT OUTLOOK IN CANADA

The Government of Canada’s NOC system places **Curator** as part of the group “Conservators and curators” (NOC 51101) and **Curator-director** as part of the group “Library, archive, museum and art gallery managers” (NOC 50010). The expertise and skills sought by employers overlap for both groups while job prospects for curator-director positions are slightly more favourable than those for curators.

Curator job profile

The following is a [curator job profile](#) created by the Government of Canada Job Bank based on current and past job postings.

CURATOR IN CANADA

Job duties

People working in this occupation usually apply the following skill set.

- Recommend the acquisition of paintings, photographs, sculptures, documents and other museum and art gallery artifacts
- Conduct research into objects' methods of construction techniques, structure and materials to understand its physical and chemical makeup
- Develop storylines and themes and organize displays and exhibitions
- Coordinate the storage of collections and the setting up of displays and exhibitions
- Oversee the conservation, display and circulation of collections
- Supervise curatorial assistants and other museum technicians.

Employment requirements

- Curators require a master's or bachelor's degree in museology, art history or a field related to their specific area of work.

Employment prospects

Government of Canada Job Bank

3-year growth prospects for curators and curator-directors

Quebec, Alberta

Ontario, Manitoba

Good (4 out of 5)

Moderate (3 out of 5)

Opportunext

5-year growth prospects for curator-director (Canada)
 10-year growth prospects for curator-director (Canada)

Good
 Excellent

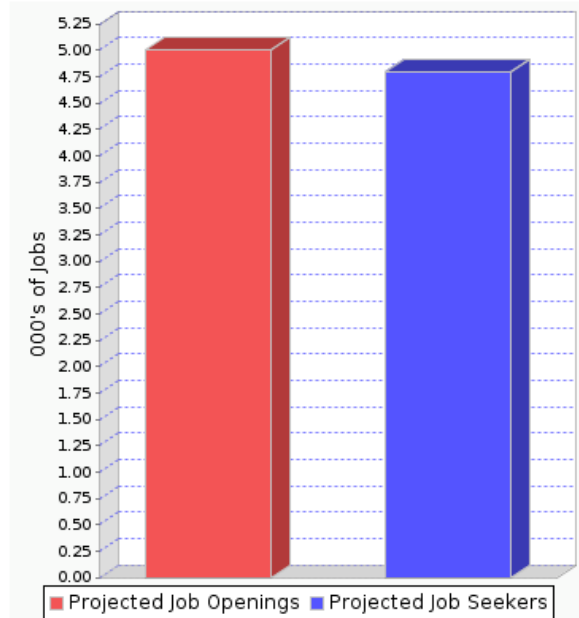
Canadian Occupation Projection System (COPS)

COPS places curators as part of the larger group of librarians, archivists, conservators and curators. Below is the projected growth and projected number of positions for the period of 2022 to 2031.

“The number of job openings (arising from expansion demand and replacement demand) (...) are expected to total **5,000**, while the number of job seekers (arising from school leavers, immigration and mobility) is expected to total **4,800**.

(...) The balance between labour supply and demand seen in recent years is expected to continue over the projection period.”

Source: Occupational Projection Summary for Librarians, archivists, conservators and curators (2022-2031)



In terms of positions, COPS projects the following numbers:

2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
16900	17300	18100	18000	18000	18000	18000	18000	18000	18100	18200

Remuneration

The Government of Canada Job Bank provides wage ranges based on available national, provincial, territorial, and economic region level data as well as official surveys. The following ranges were published in November 2022.

Curator-director

	Low (\$/hour)	Median (\$/hour)	High (\$/hour)
Canada	29.12	47.69	67.31
Quebec	38.72	43.96	79.67

Curator

	Low (\$/hour)	Median (\$/hour)	High (\$/hour)
Canada	14.5	21.75	38.54
Quebec	15.25	24.00	38.36

EMPLOYMENT OUTLOOK IN THE US

Curator job profile

Job duties

The [US Bureau of Labor Statistics](#) includes curators as part of the group “Archivists, curators and museum workers” and differentiates **curators** from **museum directors**. Job duties for both profiles include:

- Lead the acquisition, storage, and exhibition of collections
- Negotiate and authorize the purchase, sale, exchange, and loan of collections
- Research, authenticate, evaluate, and categorize the items in a collection
- Perform administrative tasks and help manage their institution’s research projects
- Represent institution in the media, at public events, and at professional conferences

Employment requirements

“Curators typically need a master’s degree in art history, history, archaeology, or museum studies. In small museums, curator positions may be available to applicants with a bachelor’s degree. Because curators have administrative and managerial responsibilities, courses in business administration, public relations, marketing, and fundraising are recommended.”

Employment prospects

+14% overall growth

According to the US Bureau of Labor Statistics, overall employment for curators is projected to grow 14 percent from 2021 to 2031, which represents 1,900 new jobs. This is higher than the 12 percent growth projected for the group of archivists, curators, and museum workers together and much higher than the average for all occupations.

A large portion of those openings are expected to result from the need to replace workers who transfer to different occupations or exit the labour force for retirement or other reasons.

In 2021, there was a total of 12,900 curator jobs in the US.

In geographical terms, most job opportunities for curators are in New York, California and Texas, with 1,660, 1,050 and 570 jobs, respectively, in May 2021. These locations are followed by North Carolina and Illinois. Detailed maps on job distribution for curators across the US can be found [here](#).

Remuneration

The median annual wage for curators in May 2021 was **\$60,110**. For archivists, curators, and museum workers as a group, the median annual wage in the top industries in which they worked were as follows:

Educational services; state, local, and private	\$60,550
Government	\$53,210
Museums, historical sites, and similar institutions	\$48,320

JOB POSTINGS IN CANADA (2018-2023)

312

Unique Postings
679 Total Postings

127

Employers Competing
239,471 Total Employers

2 : 1

Posting Intensity

Regional Average: 2 : 1

Advertised Salary

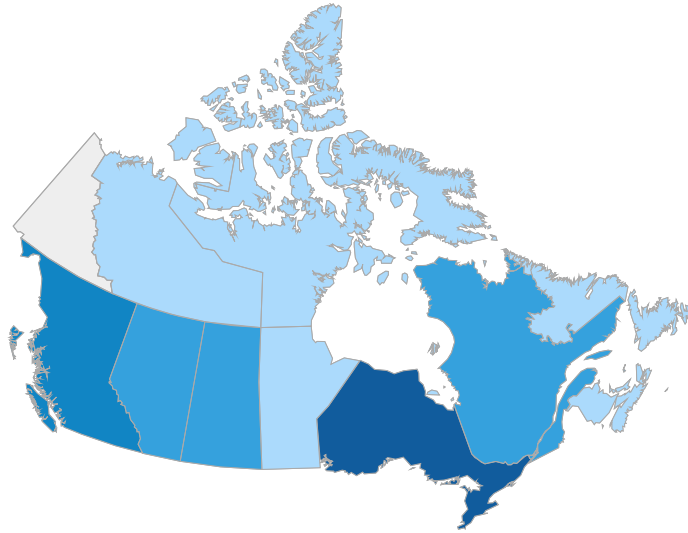
There are 189 advertised salary observations (61% of the 312 matching postings).

\$54.9K

Median Advertised Salary



Job Postings Regional Breakdown



Province	Unique Postings (May 2018 - May 2023)
Ontario	138
British Columbia	84
Alberta	27
Quebec	20
Saskatchewan	15

Education Breakdown

Education Level	Unique Postings	% of Total
No Education Listed	132	42%
High school or GED	1	0%
Associate degree	6	2%
Bachelor's degree	115	37%
Master's degree	72	23%
Ph.D. or professional degree	13	4%





















Experience Breakdown

Minimum Experience	Unique Postings	% of Total
No Experience Listed	189	61%
0 - 1 Years	12	4%
2 - 3 Years	58	19%
4 - 6 Years	48	15%
7 - 9 Years	4	1%
10+ Years	1	0%





















Top Companies Posting

	Total/Unique (May 2018 - May 2023)	Posting Intensity	Unique Postings Trend (May 2018 - May 2023)
City of Burnaby	14 / 10	1 : 1	
Workinculture (Cultural Careers Council Ontario)	10 / 9	1 : 1	
University of Toronto	12 / 9	1 : 1	
York University	16 / 8	2 : 1	
CivicInfo BC	9 / 8	1 : 1	
Western University	8 / 6	1 : 1	
Township Of Langley	7 / 6	1 : 1	
Cultural Human Resources Council	5 / 5	1 : 1	
Musée De La Civilisation	7 / 4	2 : 1	
District of West Vancouver	5 / 4	1 : 1	



















Top Cities Posting

City	Total/Unique (May 2018 - May 2023)	Posting Intensity	Unique Postings Trend (May 2018 - May 2023)
Toronto	90 / 66	1 : 1 	
Vancouver	20 / 16	1 : 1 	
Burnaby	19 / 15	1 : 1 	
Calgary	10 / 9	1 : 1 	
Langley	10 / 9	1 : 1 	
Mississauga	12 / 8	2 : 1 	
Victoria	11 / 8	1 : 1 	
Ottawa	32 / 7	5 : 1 	
London	8 / 6	1 : 1 	
Oakville	21 / 6	4 : 1 	

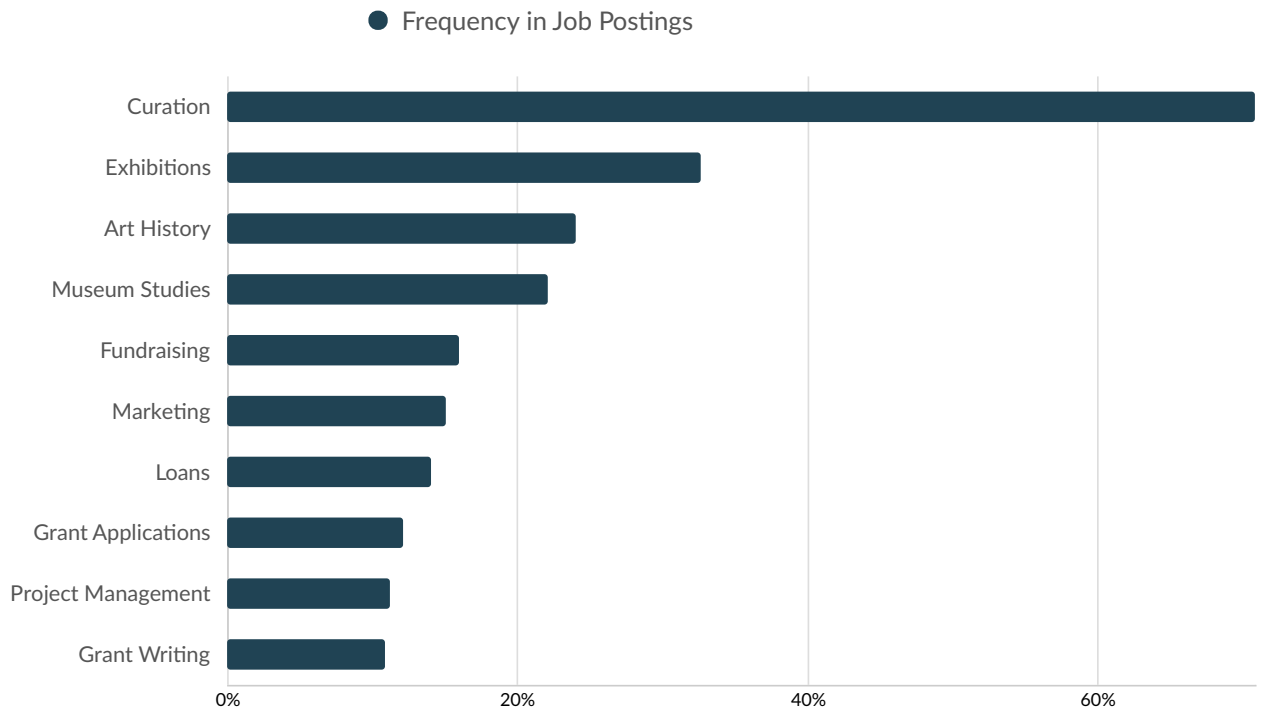
Top Posted Job Titles

	Total/Unique (May 2018 - May 2023)	Posting Intensity	Unique Postings Trend (May 2018 - May 2023)
Museum Curators	292 / 88	3 : 1 	
Curators	125 / 85	1 : 1 	
Art Curators	75 / 55	1 : 1 	
Gallery Curators	70 / 16	4 : 1 	
Content Curators	22 / 16	1 : 1 	
Chief Curators	16 / 13	1 : 1 	
Curators of Collections	27 / 10	3 : 1 	
Curators of Exhibitions	12 / 9	1 : 1 	
Curators of Exhibits	7 / 7	1 : 1 	
Curators of Education	6 / 4	2 : 1 	

Top Industries

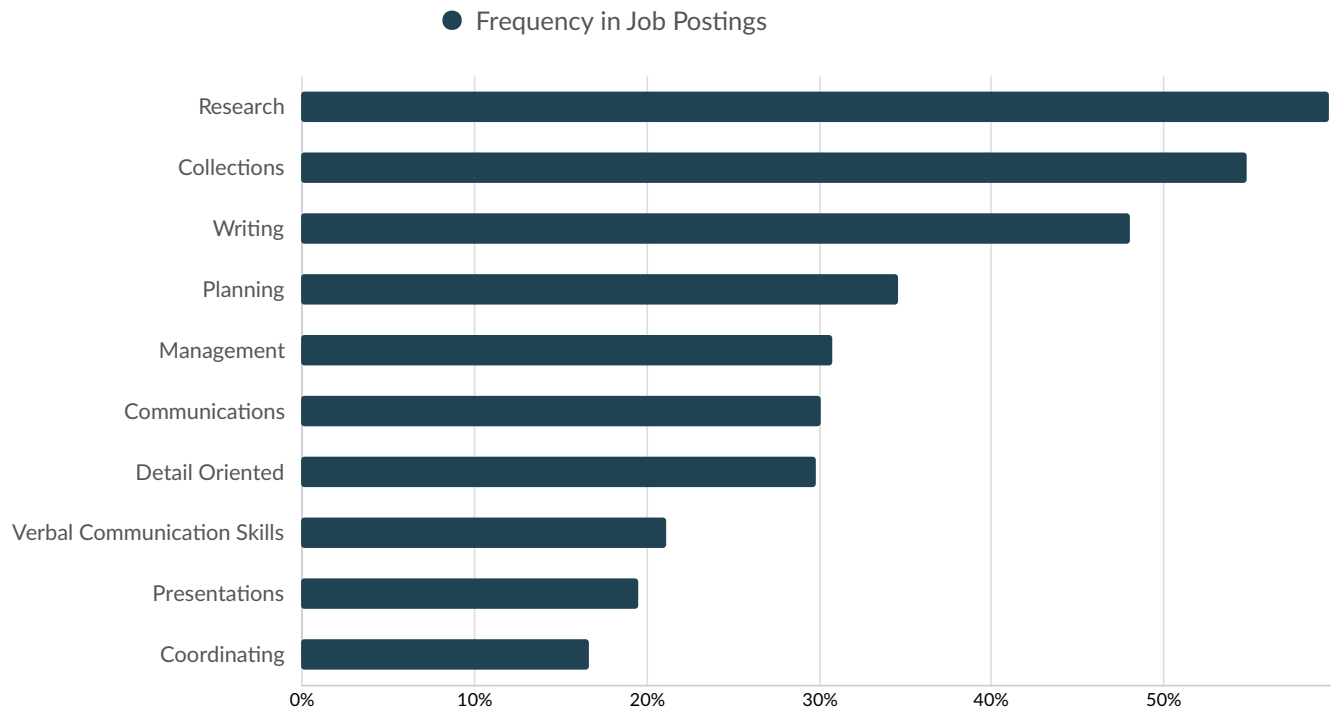
	Total/Unique (May 2018 - May 2023)	Posting Intensity	Unique Postings Trend (May 2018 - May 2023)
Colleges, Universities, and Professional Schools	55 / 37	1 : 1 	
Executive and Legislative Offices, Combined	34 / 22	2 : 1 	
Other General Government Support	26 / 18	1 : 1 	
Museums	17 / 14	1 : 1 	
Promoters of Performing Arts, Sports, and Similar Events with Facilities	10 / 9	1 : 1 	
Executive Offices	8 / 7	1 : 1 	
Elementary and Secondary Schools	9 / 5	2 : 1 	
Junior Colleges	7 / 5	1 : 1 	
Zoos and Botanical Gardens	3 / 3	1 : 1 	

Top Specialized Skills



	Postings	% of Total Postings
Curation	221	71%
Exhibitions	102	33%
Art History	75	24%
Museum Studies	69	22%
Fundraising	50	16%
Marketing	47	15%
Loans	44	14%
Grant Applications	38	12%
Project Management	35	11%
Grant Writing	34	11%

Top Common Skills



	Postings	% of Total Postings
Research	186	60%
Collections	171	55%
Writing	150	48%
Planning	108	35%
Management	96	31%
Communications	94	30%
Detail Oriented	93	30%
Verbal Communication Skills	66	21%
Presentations	61	20%
Coordinating	52	17%

CURRENT JOB POSTING SAMPLES

Canadian Centre for Architecture

Curatorial Assistant

Contractual (3 years), full time (35 hours per week)

Montreal

Job Summary

The Canadian Centre for Architecture is an institution responsive to the cultural content of our time, fueling crucial conversation with the audience. The Curatorial Assistant operates within the CCA Programs division and assists in the production of content with publications, research and collaborates transversally with collection and digital divisions in retrieving and disseminating content. The Programs division explores and organizes exhibitions, develops curatorial projects taking shape in diverse formats (i.e. from cinematographic to editorial) and contributes to public and digital programs as a form of cultural production to suggest new perspectives for architecture debate as catalyst for original inquiry.

The Curatorial Assistant leads the conception, coordination, and production of institutional curatorial activities. The incumbent assists the Associate Director, Programs in the development and content production processes of exhibitions, digital and new media projects such as films and video productions, publishing materials/editorials and public programs. The Curatorial Assistant is an active content producer in all phases of a curatorial project and alongside with guest curators and collaborators of exhibitions. The incumbent works in dialogue with various internal CCA teams, divisions and departments, as well as outside collaborators and content production companies.

Requirements

Master's degree in architecture, art history

3 to 5 years in curatorial projects / exhibitions

Excellent knowledge of spoken and written French

Knowledge in curating and producing exhibitions

Ability to develop content in written form

Musée de la civilisation

Coordonnateur.trice des services muséographiques

Poste régulier - Temps plein

Échelle salariale : 48 963 \$ à 92 831 \$* annuellement, selon l'expérience

Québe

Mandat

Nous sommes présentement à la recherche d'un.e coordonnateur(-trice) des expositions en tournée pour rejoindre la Direction de la programmation!

Ton mandat sera de coordonner les services muséographiques, la menuiserie et toutes autres opérations liées à la réalisation des expositions. Tu seras responsable de superviser, planifier, organiser et coordonner les activités et les services logistiques nécessaires au prémontage, fabrication, installation, montage, démontage, aliénation des biens de diffusion, inventaire, entreposage, transport et emballage des pièces de collection et des installations en salle. Tu agiras comme personne ressource pour assurer la communication entre les différents intervenants et services impliqués.

Tu réponds à ces exigences?

- Être titulaire d'un diplôme universitaire de 1^{er} cycle dans une discipline appropriée**
- De 3 à 5 ans d'expérience dans des fonctions similaires
- Très bonne connaissance du processus de réalisation d'expositions et des principes de la menuiserie et vue d'ensemble de la programmation dans un milieu muséal
- Excellente maîtrise du français parlé et écrit et connaissances fonctionnelles de l'anglais parlé et écrit

***Sous réserve de l'appréciation des compétences, toute combinaison de scolarité et d'expérience jugée équivalente et pertinente pourra être considérée.*

Art Gallery of Ontario

Contemporary Art Curator

Salary \$96,405 to 120,520 annually (to be negotiated) / 35 hours per week

Permanent employment, full time

Toronto

Responsibilities

- Recommend the acquisition of museum and gallery artifacts
- Supervise technicians, assistants, students or interns, staff or volunteers
- Research origins and history of artifacts
- Train technicians, assistants, students or interns
- Develop storyline and theme of displays and exhibitions
- Co-ordinate the storage of collections and setting-up of displays and exhibitions
- Provide consultation to museums, art galleries or private individuals
- Oversee the conservation, display and circulation of collections

Supervision

- 3-4 people

Education & experience

- Master's degree or equivalent experience
- Art history, criticism and conservation
- 5 years or more of experience

Appendix 7: budget

LOI Budget Chart

Department: _____
Program Title: _____

NOTE : ONLY 2023-24 NEED TO BE POPULATED

	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29
	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5

EXPENSES

Teaching - Number of Full Time positions	TT %	100%	100%	100%	100%	100%	100%
	ETA %	100%	100%	100%	100%	100%	100%
	LTA %	100%	100%	100%	100%	100%	100%
	Lecturer %	100%	100%	100%	100%	100%	100%

Number of course remissions requested

Technical support - Number of positions

Part Time Contracts - Number of contracts

Teacher's Assistants - Hours

Administrative Staff - Number of positions	Director %	100%	100%	100%	100%	100%	100%
	Office support	230	200	200	200	200	200
	Professional %	0	100%	100%	100%	100%	100%
		100%	100%	100%	100%	100%	100%

EXPENSES		Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TEACHING								
	Salary	Salary and Benefits						
Tenure Track	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Extended Term appointment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Limited Term Appointment	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lecturer	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Course remissions	\$ 12,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Technical support	\$ 71,000	\$ -	\$ -	\$ -	\$ 44,837	\$ 44,837	\$ 44,837	\$ 134,510
Part Time Contracts	\$ 12,500	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 250,000
Teacher's Assistants	\$ 29.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Stipends	\$ -	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 3,000
Other	\$ 5,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 20,000
ADMIN STAFF								

Comments

A donor will cover the entire salary for a technician at the Curatorial Lab for the first 2 years and the cost of materials is included in the Certificate budget since it is expected the programme will use the Lab up to 1/2 the year. During

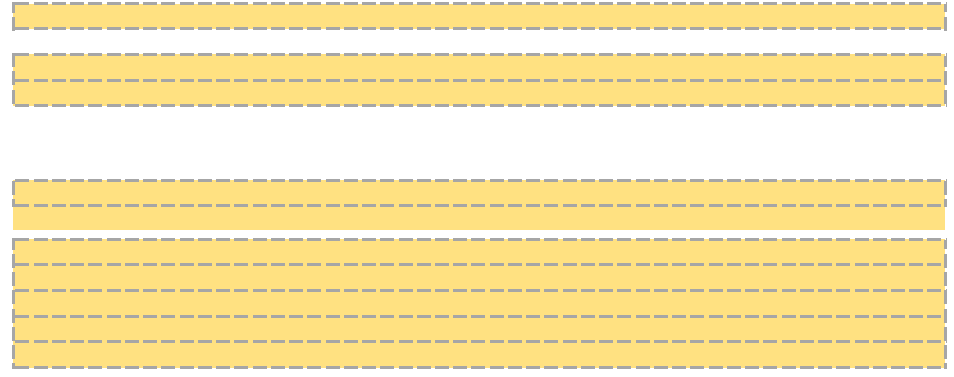
4 new courses developed for the Certificate (the elective will be possible from within existing IMA seminar courses or chosen from other graduate courses (e.g. extraterrestrial film studies, sociology, gender studies, history etc) by

honoraria for invited guests - 200\$ per course in certificate, not practicum or elective

Marketing budget each year

LOI Budget Chart

Director		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Office support	\$ 32	\$ 9,296	\$ 8,083	\$ 8,083	\$ 8,083	\$ 8,083	\$ 8,083	\$ 49,712
Professional		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Payroll		\$ 14,296	\$ 61,683	\$ 61,683	\$ 106,520	\$ 106,520	\$ 106,520	\$ 457,221
OTHER EXPENSES								
New Classroom, renovation and lab equipment - NON-CAPITAL								\$ -
New Classroom, renovation and lab equipment - CAPITAL								\$ -
Rent								\$ -
Taxes								\$ -
Maintenance-Security								\$ -
Operating cost								\$ -
Other								\$ -
Total Other Expenses		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Expenses		\$ 14,296	\$ 61,683	\$ 61,683	\$ 106,520	\$ 106,520	\$ 106,520	\$ 457,221



LOI Budget Chart

Department:
Program Title:

NOTE : ONLY NEED TO BE POPULATED

	2024-25	2025-26	2026-27	2027-28	2028-29
	Year 1	Year 2	Year 3	Year 4	Year 5
STUDENTS					
Cycle 1 FTE (FTE = 30 credits)					
New Cycle 1 FTE registered in the program					
Total credits for Program					
Attrition rate	10%				
TOTAL FTE	0.00	0.00	0.00	0.00	0.00
Program Family					
Choose a Family					
Weight	0.00				
Weighted FTE	0.00	0.00	0.00	0.00	0.00

Comments

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)	\$ 2,797	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Grants							
Teaching Grant (WFTE)	\$ 3,906	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Support Grant (FTE)	\$ 2,386	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total grants		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
External							\$ -
Total Revenue	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Additional Funding							
Internal							
Provost Office							\$ -
Institutional							\$ -
Capital Fund (1)							\$ -
Other							\$ -
Total internal sources of funding for the faculty	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Department:
Program Title:

NOTE : ONLY NEED TO BE POPULATED

		Year 1	Year 2	Year 3	Year 4	Year 5	Comments
STUDENTS							
Cycle 2 FTE (FTE = 30 credits)							
New Cycle 2 FTE registered in the program		7	7	7	7	7	14 students taking 15 credits = 7 FTE.
Total credits for Program							
Attrition rate							
TOTAL FTE		7.00	7.00	7.00	7.00	7.00	
Program Family							
Fine Arts							
Weight		5.25					
Weighted FTE							
		36.75	36.75	36.75	36.75	36.75	

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)	\$ 2,797	\$ 19,579	\$ 19,579	\$ 19,579	\$ 19,579	\$ 19,579	\$ 97,895
Grants							
Teaching Grant (WFTE)	\$ 3,906	\$ 143,546	\$ 143,546	\$ 143,546	\$ 143,546	\$ 143,546	\$ 717,728
Support Grant (FTE)	\$ 2,386	\$ 16,702	\$ 16,702	\$ 16,702	\$ 16,702	\$ 16,702	\$ 83,510
Total grants		\$ 160,248	\$ 160,248	\$ 160,248	\$ 160,248	\$ 160,248	\$ 801,238
External							\$ -
Total Revenue	\$ -	\$ 179,827	\$ 179,827	\$ 179,827	\$ 179,827	\$ 179,827	\$ 899,133

Additional Funding							
Internal							
Provost Office							\$ -
Institutional							\$ -
Capital Fund (1)							\$ -
Other							\$ -
Total internal sources of funding for the faculty	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Note 1 : Linked to capital expenses

LOI Budget Chart

Department:
Program Title:

NOTE : ONLY NEED TO BE POPULATED

	Year 1	Year 2	Year 3	Year 4	Year 5	Comments
STUDENTS						
Cycle 3 FTE (FTE = 30 credits)						
New Cycle 3 FTE registered in the program	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	
Total credits for Program	<input type="text" value="0"/>					
Attrition rate	<input type="text" value="10%"/>					
TOTAL FTE	0.00	0.00	0.00	0.00	0.00	
Program Family	<input type="text" value="Choose a Family"/>					
Weight	<input type="text" value="0.00"/>					
Weighted FTE	0.00	0.00	0.00	0.00	0.00	

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)	<input type="text" value="\$ 2,797"/>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Grants							
Teaching Grant (WFTE)	<input type="text" value="\$ 3,906"/>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Support Grant (FTE)	<input type="text" value="\$ 2,386"/>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total grants		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
External	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	\$ -
Total Revenue	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Additional Funding							
Internal							
Provost Office	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	\$ -
Institutional	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	\$ -
Capital Fund (1)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	\$ -
Other	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	\$ -
Total internal sources of funding for the faculty	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

LOI Budget Chart

Department:
Program Title:

Program Financial Viability

REVENUE	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Tuition Fee							
Tuition (FTE)		\$ 19,579	\$ 19,579	\$ 19,579	\$ 19,579	\$ 19,579	\$ 97,895
Grants							
Teaching Grant (WFTE)		\$ 143,546	\$ 143,546	\$ 143,546	\$ 143,546	\$ 143,546	\$ 717,728
Support Grant (FTE)		\$ 16,702	\$ 16,702	\$ 16,702	\$ 16,702	\$ 16,702	\$ 83,510
Total grants		\$ 160,248	\$ 160,248	\$ 160,248	\$ 160,248	\$ 160,248	\$ 801,238
Additional Funding External	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Revenue	\$ -	\$ 179,827	\$ 179,827	\$ 179,827	\$ 179,827	\$ 179,827	\$ 899,133

EXPENSES	Year 0 Start-Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
TEACHING							
Tenure Track	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Extended Term Contrats	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Limited Term Contracts	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Lecturers	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Course remissions	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Technical support	\$ -	\$ -	\$ -	\$ 44,837	\$ 44,837	\$ 44,837	\$ 134,510
Part Time Contracts	\$ -	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000	\$ 250,000
Teacher's Assistants	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Stipends	\$ -	\$ 600	\$ 600	\$ 600	\$ 600	\$ 600	\$ 3,000
Other	\$ 5,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 20,000
ADMIN STAFF							
Administrative Staff	\$ 9,296	\$ 8,083	\$ 8,083	\$ 8,083	\$ 8,083	\$ 8,083	\$ 49,712
Total Payroll	\$ 14,296	\$ 61,683	\$ 61,683	\$ 106,520	\$ 106,520	\$ 106,520	\$ 457,221

LOI Budget Chart

OTHER EXPENSES														
Total Other Expenses	\$	-	\$	-	\$	-	\$	-	\$	-				
Total Expenses	\$	14,296	\$	61,683	\$	61,683	\$	106,520	\$	106,520	\$	106,520	\$	457,221
CONCORDIA UNIVERSITY SURPLUS / (DEFICIT)	\$	(14,296)	\$	118,143	\$	118,143	\$	73,307	\$	73,307	\$	73,307	\$	441,911

Curatorial Studies

Admission Requirements

- Bachelor's degree in museology art history, curatorial studies, visual arts, art education, cultural/history studies, or a related field.
- Alternatively, applicants with relevant professional experience, a non-traditional educational path or lived experience will be considered based on their application dossier.
- Proficiency in English: applicants whose primary language is not English must demonstrate that their knowledge of English is sufficient to pursue graduate studies in their chosen field. Please refer to the [English language proficiency page](#) for further information on the requirements and exemptions.

Degree Requirements

Graduate Microprogram in Curatorial Studies (12 credits)

9.0 credits:

- ARTH 676 Introduction to Curatorial Practices and Theory (3.00)
- ARTH 677 Advanced Topics in Curatorial Practice and Theory (3.00)
- ARTH 678 Exhibition Concept Design (3.00)

3.0 credits chosen from MA seminars within the department of Art History or from across the university with permission of the Graduate Program Director.

Academic Regulations

1. **Academic Standing.** Please refer to the Academic standing section of the Calendar for a detailed review of the Academic regulations.
2. **Time Limit.** Please refer to the Academic regulations page for further details regarding the Time limits. It is expected that students will normally complete the microprogram within two terms.
3. **Completion Requirement.** To obtain a letter of attestation, students must have a cumulative GPA of 2.70.

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