Jia Yuan, Yu

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Work Experience

Associate Professor
CIISE, Faculty of Engineering and Computer Science,
Concordia University, Montréal. August 2015–present.

- ◇ Data Science, Smart Cities, Internet of Things.

Research Scientist
IBM Research Ireland, Dublin. July 2011–August 2015.

- ◇ Applying machine learning, statistics, and game theory to multi-agent systems, data science, and designing smart cities to mitigate climate change.
- ◇ IBM Principal Investigator for the INSIGHT project (partly funded by EU FP7, insight-ict.eu). The objective is to build a decision-support system that analyzes real-time measurements from thousands of dedicated sensors and crowdsourced measurements from users through a smartphone app. The system detects, labels, and displays traffic and emergency events to end-users in the city of Dublin and German ministry of civil protection.
- ◇ Additional projects on congestion management, car- and ride-sharing, crowdsourcing, incentive mechanisms, smart grids, etc.

Adjunct Faculty Member
School of Computing, Dublin City University. June 2013–August 2015.

Postdoctoral Researcher
Ecole Normale Supérieure and HEC Paris. September 2010–July 2011.

Postdoctoral Researcher
Stanford University, Stanford. January 2010–September 2010.

Funding

H2020 VAVEL (Co-applicant, 2015)
€0.5 million to IBM Research over three years; €4 million to our consortium.

EU FP7 INSIGHT (Co-applicant, 2012)
€0.8 million to IBM Research over three years; €4 million to our consortium.

IBM-EDF First-of-a-Kind project (2011)
€0.2 million for joint research with Electricité de France.

Education

Ph.D. in Electrical Engineering Advisor: Shie Mannor.
McGill University, Montréal. 2010.

Master of Engineering in Electrical Engineering
McGill University, Montréal. 2006.

Bachelor of Engineering in Electrical Engineering (Honours)
McGill University, Montréal. 2004.

Research Interests

- Smart Cities: multi-agent systems, game theory, distributed optimization, ressource allocation, congestion management, smart grids.
- Data Science: machine learning, statistics, sequential decision-making.

Services

Program Committee Member: ICDM, AAMAS.

Working Papers

- W. Griggs, J. Y. Yu, F. Wirth, F. Häusler, R. Shorten. On the Design of Campus Parking Systems with QoS guarantees. Preprint available.
- M. Cisse, K. Humphreys, and J. Y. Yu. Crowdsourced Electricity Demand Forecast. Under review, preprint available.
- J. Mareček, R. Shorten, and J. Y. Yu. Congestion Management by Interval Signaling. Under review, arXiv:1404.2458.
- L. Tran-Thanh and J. Y. Yu. Functional Bandit Optimisation. Under review, arXiv:1405.2432.

Conference Proceedings

- F. Schnitzler, J. Y. Yu, and S. Mannor, Sensor Selection for Crowdsensing Dynamical Systems, *International Conference on Artificial Intelligence and Statistics*, 2015.
- L. Brink, R. Shorten, and J. Y. Yu. Signaled Queueing. *International Conference on Autonomous Agents and Multiagent Systems*, 2015.
- Y. Chow and J. Y. Yu. Real-time Bidding-based Vehicle Sharing. *International Conference on Autonomous Agents and Multiagent Systems*, 2015.
- F. Wirth, S. Stuedli, J. Y. Yu, M. Corless, and R. Shorten. Asynchronous Algorithms for Network Utility Maximisation with a Single Bit. *European Control Conference*, 2015.
- F. Wirth, S. Stuedli, J. Y. Yu, M. Corless, and R. Shorten. A result for nonhomogeneous place-dependent Markov Chains arising in the study of the AIMD algorithm and its application to certain optimisation problems. *Allerton Conference on Communication, Control, and Computing*, 2014.
- B. Gorman, J. Mareček, and J. Y. Yu. Traffic Management using RTEC in OWL 2 RL. *International Semantic Web Conference*, 2014.
- J. Y. Yu and E. Nikolova. Sample complexity of risk-averse bandit-arm selection. *International Joint Conferences on Artificial Intelligence*, 2013.
- M. Mevissen, E. Ragnoli and J. Y. Yu. Data-driven Distributionally Robust Polynomial Optimization. *Advances in Neural Information Processing Systems (NIPS)* and *International Conference on Continuous Optimization*, 2013.
- R. Gummadi, R. Johari and J. Y. Yu. Mean Field Equilibria of Multiarmed Bandit Games. *ACM Electronic Commerce*, 2012.
- J. Y. Yu and S. Mannor. Unimodal bandits. *International Conference of Machine Learning*, 2011.
- S. Bubeck, G. Stoltz and J. Y. Yu. Lipschitz Bandits without the Lipschitz Constant. *Algorithmic Learning Theory*, 2011.
- S. Gerchinovitz and J. Y. Yu. Adaptive and Optimal Online Linear Regression on ℓ^1-balls. *Algorithmic Learning Theory*, 2011.
- J. Y. Yu and S. Mannor. Arbitrarily modulated Markov decision processes. *IEEE Conference on Decision and Control*, 2009.
- J. Y. Yu and S. Mannor. Piecewise-stationary bandit problems with side observations. *International Conference of Machine Learning*, 2009.
- J. Y. Yu and S. Mannor. Online Learning in Markov Decision Processes with Arbitrarily Changing Rewards and Transitions. *International Conference on Game Theory for Networks (GameNets)*, 2009.
- J. Y. Yu, S. Mannor, and N. Shimkin. Markov Decision Processes with Arbitrarily Varying Rewards. *European Workshop on Reinforcement Learning*, 2008.
- B. Kveton, J. Y. Yu, G. Theocharous, and S. Mannor. Online learning with expert advice and finite-horizon constraints. *AAAI Conference on Artificial Intelligence*, 2008.

- B. Kveton, J. Y. Yu, G. Theocharous, and S. Mannor. A Lazy Approach to Online Learning with Constraints. *International Symposium on Artificial Intelligence and Mathematics*, 2008.
- J. Y. Yu and S. Mannor. Asymptotics of Efficiency Loss in Competitive Market Mechanisms. *IEEE International Conference on Computer Communications (INFOCOM)*, 2006.

Journal Papers

- J. Naoum-Sawaya, J. Y. Yu. Carpooling for Evacuation. Preprint available.
- F. Wirth, S. Stuedli, J. Y. Yu, M. Corless, and R. Shorten. Nonhomogeneous Place-Dependent Markov Chains, Unsynchronised AIMD, and Network Utility Maximization. Submitted. arXiv:1404.5064
- J. Mareček, R. Shorten, and J. Y. Yu. Signaling and obfuscation for congestion control. *International Journal of Control* (to appear), 2015. arXiv:1406.7639.
- R. Gummadi, R. Johari and J. Y. Yu. Mean Field Equilibria of Multiarmed Bandit Games. *SSRN*, 2013.
- S. Gerchinovitz and J. Y. Yu. Adaptive and Optimal Online Linear Regression on ℓ^1-balls. *Theoretical Computer Science*, 2013.
- J. Y. Yu, S. Mannor, and N. Shimkin. Markov Decision Processes with Arbitrarily Varying Rewards. *Mathematics of Operations Research* 34(3), 737–757, 2009.
- S. Mannor, J. N. Tsitsiklis, and J. Y. Yu. Online learning with sample path constraints. *Journal of Machine Learning Research* 10(Mar), 569–590, 2009.
- J. Y. Yu and S. Mannor. Efficiency Loss of Market-based Resource Allocation with Many Participants. *IEEE Journal on Selected Areas in Communications* 25(6), 1244–1259, 2007.

Patent Disclosures

- M. Rufli, R. Shorten, T. Tchrakian, F. Wirth, and J. Y. Yu. Distributed Parking Space Detection, Characterization, Advertisement, and Enforcement (2015). Filed.
- R. Cogill, J. Naoum-Sawaya, S. Sajja, R. Shorten, F. Wirth, and J. Y. Yu. Joint Meeting Scheduling and Carpooling (2015). Filed.
- J. Marecek, R. Shorten, F. Wirth, and J. Y. Yu. Queuing with signaling, variable capacity, and revenue management (2014). Filed.
- J. Y. Yu, A. Gkoulalas-Divanis, and C. Bekas. Insight Market (2013). Filed.
- J. Y. Yu. Distributed forecasting and pricing system (2012). Filed.
- M. Mevissen, E. Ragnoli and J. Y. Yu. System and Method for data-driven distributionally robust polynomial optimization (2012). Filed.

Interns

- Pengqian Yu (National University of Singapore). Risk sensitive Markov decision problems, 2015.
- Andrea Mauri (Politecnico di Milano). Crowdsourcing worker selection, 2015.
- Yinlam Chow (Stanford University). Cost-division for ride-sharing with autonomous vehicles, 2014.
- Laura Brink (Yale University). Signaling for queue management, 2014.
- Kenneth Humphreys and Anubha Maithani (University College Dublin). Crowdsourced power demand forecast, 2014.
- Sonja Stüdli (Newcastle University). Privacy-preserving distributed optimization, 2013.