# R. Emre Erkmen, PhD, MSc, BE, P.Eng.

Assistant Professor,
Department of Building, Civil & Environmental Engineering
Concordia University, Montreal, H3G 1M8, Canada
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## EDUCATION

**PhD in Civil/Structural Engineering**                          January 2002 – December 2006
*University of Ottawa*
**Title of study:**                    Finite Element Formulations for Thin-walled Members

**MSc in Civil/Structural Engineering**                          September 1999 – July 2001
*Istanbul Technical University*
**Title of study:**                    Three-dimensional Analysis of Buildings on Elastic Foundations

**BE in Civil Engineering**                          September 1995 – June 1999
*Istanbul Technical University*

## AWARDS and GRANTS

- UTS, Faculty of Engineering and IT, Linkage Project Seed Funding Grants, 2014
- Engineering Computations, Highly Commended Paper Award, 2012
- Industry and Innovation Grant, University of Technology, Sydney, 2012
- Early Career Research Award, The University of New South Wales, 2009, 2010
- Engineering Faculty Research Funding Scholarship, University of Ottawa, 2003
- Association of Professors University of Ottawa Award, 2003

## PROFESSIONAL EXPERIENCE

**Assistant Professor**                          January 2019 –
*Concordia University, Montreal*
- Introduction to Structural Dynamics          :Winter  2019

**Lecturer/Senior Lecturer**                          August 2010 – December 2018
*University of Technology Sydney*
- Finite Element Analysis          : 2016-
- Advanced Engineering Computing          : 2011-
- Mechanics of Materials          : Fall 2010, Summer 2011, Fall 2013

**Research Associate**                          October 2007 – August2010
*The University of New South Wales*
- Time-Dependent, Dynamic, Creep and Shrinkage Response of Curved Structural Members
- Analysis of Steel-Concrete Composite Structural Members

**Post-Doctoral Research Associate**                          January 2007 – August 2007
*University of Ottawa*
- Finite Element Formulations for Buckling Analysis of Thin-walled Members

**Lecturer (Sessional)**                          September 2006 – August 2007
*University of Ottawa*
- Theory of Structures II          : Fall 2006
- Mechanics of Materials I          : Winter 2007
- Structural Steel Design          : Summer 2007

**Teaching Assistant**                          September 2002 – May 2006
*University of Ottawa*

**Research Assistant**                          May 2003 – September 2007
*University of Ottawa*
- Developing Finite Element Formulations for Linear and Non-linear Analysis of Thin-Walled Members

# REFEREED JOURNAL PUBLICATIONS

Sarikaya, A., **Erkmen, R.E.** (2019) "A Plastic-damage Model for Concrete under Compression", *International Journal of Mechanical Sciences* Vol. 150: 584-593.

**Erkmen, R.E.,** Gottgens. (2018) "A Shell Element for Buckling Analysis of Thin-walled Composite Laminated Members", *International Journal of Structural Stability and Dynamics* Vol. 18.

Nguyen, V.V., Li, J., **Erkmen, R.E.,** Alamdari, M.M., and Dackermann, U. (2018) "FRF Sensitivity-based Damage Identification Using Linkage Modelling for Limited Sensor Arrays", *International Journal of Structural Stability and Dynamics* Vol. 18.

Niki V. and **Erkmen, R.E.** and (2017) "Shear Deformable Hybrid Finite Element Formulation for Buckling Analysis of Composite Columns", *Canadian Journal of Civil Engineering* Vol. 45: 279-288.

**Erkmen, R.E.** and Afnani, A. (2017) "Iterative Global-local Approach to consider the Local effects in Dynamic Analysis of Beams", *Coupled Systems Mechanics* Vol. 6: 501-522.

Afnani, A., **Erkmen, R.E.** and Niki V. (2017) "An Efficient Formulation for Thin-walled Beams Curved in-plan", *International Journal of Steel Structures* Vol. 17: 1-16.

**Erkmen, R.E.,** and Saleh, A. (2017) "Iterative Global-local Approach to Consider the Effects of Local Elasto-plastic Deformations in the Analysis of Thin-walled Members", *International Journal for Multiscale Computational Engineering* Vol. 15: 143-173.

**Erkmen, R.E.,** Gowripalan, N. and Sirivivatnanon, V. (2017) "Elasto-plastic Damage Modelling of Beams and Columns with Mechanical Degradation", *Computers and Concrete* Vol. 19:315-323.

**Erkmen, R.E.,** Mohareb, M. and Afnani, A. (2017) "Multi-scale Overlapping Domain Decomposition to Consider Elasto-plastic Local Buckling Effects in the Analysis of Pipes", *International Journal of Structural Stability and Dynamics* Vol. 17:1-28.

**Erkmen, R.E.,** Saleh, A. and Afnani, A. (2016) "Incorporating Local Effects in the Predictor Step of the Iterative Global-local Analysis of Beams", *International Journal for Multiscale Computational Engineering* Vol. 14:455-477.

Afnani, A. and **Erkmen, R.E.** (2016) "Iterative Global-local Procedure for the Analysis of Composite Thin-walled Laminates", *Steel and Composite Structures*; Vol. 20:693-718.

**Erkmen, R.E.** (2015) "Multiple-point Constraint Applications for the Finite Element Analysis of Shear Deformable Composite Beams - Variational Multiscale Approach to Enforce Full Composite Action", *Computers & Structures* ; Vol. 149:17-30

**Erkmen, R.E.** Bradford M.A., Crews, K. (2014) "Treatment of Locking Behaviour for Displacement-based Finite Element Analysis of Composite Beams" *Structural Engineering and Mechanics*; Vol. 51:163-180

**Erkmen, R.E.** (2014) "Alleviation of Parasitic Slip in Finite Element Analysis of Composite Beams", *Computers & Structures* ; Vol. 135:10-19

**Erkmen, R.E.** (2014) "Shear Deformable Hybrid Finite-element Formulation for Buckling Analysis of Thin-walled Members", *Finite Elements in Analysis and Design*; Vol. 82:32-45

Liu X., Bradford, M.A. and **Erkmen, R.E.** (2013) "Nonlinear Inelastic Analysis of Steel-Concrete Composite Beams Curved in-Plan", *Engineering Structures*; Vol. 57:484-492

**Erkmen, R.E.** (2013) "Bridging Multi-scale Approach to Consider the Effects of Local Deformations in the Analysis of Thin-walled Members", *Computational Mechanics*; Vol. 52:65-79

Liu X., Bradford, M.A. and **Erkmen, R.E.** (2013) "Time-Dependent Response of Spatially-Curved Steel-Concrete Composite Members: 1. Computational modelling", *Journal of Structural Engineering, ASCE*; Vol. 139 (12)

Liu X., Bradford, M.A. and **Erkmen, R.E.** (2013) "Time-Dependent Response of Spatially-Curved Steel-Concrete Composite Members: 2. Curved beam experimental modelling", *Journal of Structural Engineering, ASCE*; Vol. 139 (12)

**Erkmen, R.E.** and Saleh A. (2012) "Eccentricity Effects in the Finite Element Analysis of Composite Beams", *Advances in Engineering Software*; Vol. 52: 55-59

Liu X., **Erkmen, R.E.** and Bradford, M.A. (2012) "Creep and Shrinkage Analysis of Curved Composite Beams with Partial Interaction", *International Journal of Mechanical Sciences*; Vol. 58: 57-68

**Erkmen, R.E.,** Bradford, M.A. and Crews, K. (2012) "Variational Multi-scale Approach to Enforce Perfect Bond in Multiple-Point Constraint Application when Forming Composite Beams", *Computational Mechanics*; Vol. 449: 617-628

**Erkmen, R.E.** and Attard, M.M. (2011) "Lateral-torsional Buckling Analysis of Thin-walled Beams including Shear and Pre-buckling Deformation Effects", *International Journal of Mechanical Sciences*; Vol. 53: 918-925

**Erkmen, R.E.** and Attard, M.M. (2011) "Displacement-based Finite Element Formulations for Material Non-linear Analysis of Composite Beams and Treatment of Locking behaviour", *Finite Elements in Analysis and Design*; Vol. 47: 1293-1305

**Erkmen, R.E.** and Bradford, M.A. (2011) "Coupling of Finite Element and Meshfree Methods for Locking-free Analysis of Shear-deformable Beams and Plates", *Engineering Computations*; Vol. 28: 1003-1027

**Erkmen, R. E.** and Bradford, M.A. (2011) "Non-linear Inelastic Dynamic Analysis of I-beams Curved in-Plan", *Journal of Structural Engineering, ASCE*; Vol. 137: 1373-1380

**Erkmen, R.E.** and Bradford, M.A. (2011) "Non-linear Quasi-viscoelastic Behavior of Composite Beams Curved in-Plan", *Journal of Engineering Mechanics, ASCE*; Vol. 137: 238-247

**Erkmen, R.E.** and Bradford, M.A. (2011) "Treatment of Slip-locking for Displacement-based Finite Element Analysis of Composite Beam-columns", *International Journal for Numerical Methods in Engineering*; Vol. 85: 805-826

**Erkmen, R.E.** and Bradford, M.A. (2011) "Time-dependent Creep and Shrinkage Analysis of Composite Beams Curved in-Plan", *Computers & Structures* ; Vol. 89(1-2): 67-77

**Erkmen, R.E.** and Bradford, M.A. (2010) "Elimination of Slip-locking in Composite Beam-column Analysis by using the Element-free Galerkin Method", *Computational Mechanics*; Vol. 46: 911-924

**Erkmen, R. E.,** Mohareb, M. and Bradford, M.A. (2009) "Complementary Energy based Formulation for Torsional Buckling of Columns", *Journal of Engineering Mechanics, ASCE*; Vol. 135(12): 1420-1426

**Erkmen, R. E.** and Bradford, M.A. (2009) "Non-linear Elastic Analysis of Composite Beams Curved in-Plan", *Engineering Structures*; Vol. 31(7): 1613-1624

**Erkmen, R. E.** and Bradford, M.A. (2009) "Non-linear Elasto-dynamic Analysis of I-beams Curved in-Plan", *International Journal of Structural Stability and Dynamics*; Vol. 9(2): 213-241

**Erkmen, R. E.** and Mohareb, M. (2008) "Buckling Analysis of Thin-walled Open Members – A Complementary Energy Variational Principle", *Thin-Walled Structures*; Vol. 46(6): 602-617

**Erkmen, R. E.** and Mohareb, M. (2008) "Buckling Analysis of Thin-walled Open Members – A Finite Element Formulation", *Thin-Walled Structures*; Vol. 46(6): 618-636

**Erkmen, R. E.** and Mohareb, M. (2006) "Torsion Analysis of Thin-walled Beams including Shear deformation Effects", *Thin-Walled Structures*; Vol. 44(10): 1096-1108

**Erkmen, R. E.** and Mohareb, M. (2006) "Non-orthogonal Solution for Thin-walled Beams I: Finite Element Formulation", *Canadian Journal of Civil Engineering,* special issue on steel research; Vol. 33(4): 421-439

**Erkmen, R. E.** and Mohareb, M. (2006) "Non-orthogonal Solution for Thin-walled Beams II: Applications and Modelling Considerations", *Canadian Journal of Civil Engineering,* special issue on steel research; Vol. 33(4): 440-450

## CONFERENCE PUBLICATIONS

Nguyen, V.V., Li, J. and **Erkmen, R.E.,**. "Numerical Investigation of a Linkage Modelling Technique for Damage Identification Using FRF-Based Model Updating", The 8th International Conference on Structural Health Monitoring and Intelligent Infrastructure, Brisbane, Australia, December 2017.

**Erkmen, R.E.,** Gowripalan, N. and Sirivivatnanon, V. "Elasto-plastic Membrane Modelling of ASR affected Reinforced Concrete Beams", Advances in Concrete Materials and Structures, Adelaide, Australia, October 2017.

**Erkmen, R.E.,** and Afnani, A. "Multi-scale overlapping domain decomposition to consider local effects in the analysis of pipes", Proceedings of the second international conference on performance-based and life-cycle structural engineering, Brisbane, Queensland, Australia, December 2015.

Afnani, A., Niki, V. and **Erkmen, R.E.,**. "A finite element formulation for the analysis of horizontally curved thin-walled members", International Mechanical Engineering Congress and Exposition, Houston, Texas, USA, November 2015.

**Erkmen, R.E.,** Afnani, A., and Niki, V. "Stiffness update procedure for iterative global-local analysis of columns", International Mechanical Engineering Congress and Exposition, Houston, Texas, USA, November 2015.

Moshiri, F., Gardner, A., **Erkmen, R.E.,** Jarman, R., Khabbaz, H. "Enhancing Industry Exposure, Discovery-based and Cooperative Learning in Mechanics of Solids", Proceedings of the Australasian Association for Engineering Education Conference, Wellington, New Zealand, December 2014.

**Erkmen, R.E.,** Afnani A. "Bridging Multiscale Method to Consider the Effects of Local Deformations in the Analysis of Composite Thin-walled Members", 11th World Congress on Computational Mechanics, Barcelona, Spain, July 2014

**Erkmen, R.E.,** Niki V. "Shear-deformable Hybrid Finite Element Formulation for Buckling Analysis of Thin-walled Members", 11th World Congress on Computational Mechanics, Barcelona, Spain, July 2014

**Erkmen, R.E.** "Multiscale Overlapping Domain Decomposition to Consider Local Deformations in the Analysis of Thin-walled Members", 1st Australasian Conference on Computational Mechanics, Australia, Sydney, October 2013

**Erkmen, R.E.** "Elimination of Slip-locking in Composite Beam Analysis by using a Meshfree Method", 5th International Conference on the Structural Engineering, Mechanics and Computation, South Africa, Cape Town, September 2013

**Erkmen, R.E.** "Multiscale Nonlinear Elastic Analysis of Thin-walled Members Including Local Effects", 22nd Australasian Conference on the Mechanics of Structures and Materials, Australia, Sydney, December 2012

**Erkmen, R.E.** "Variational Multiscale Approach to Recover Perfect Bond in the Finite Element Analysis of Composite Beams", 11th International Conference on Computational Structures Technology, Dubrovnik, Croatia, September 2012

Liu X., **Erkmen, R.E.** and Bradford, M.A. "Creep and Shrinkage Analysis of Curved Composite Beams Including the Effects of Partial Interaction", 11th International Conference on Computational Structures Technology, Dubrovnik, Croatia, September 2012

Bradford MA, Liu X, **Erkmen R.E.** "Spatially-curved Composite Beams: Numerical Analysis and Experimental Results", 7th *International Conference on Computational Analysis of Shell and Spatial Structures*, Sarajevo, Bosnia and Herzegovina, March 2012

**Erkmen, R. E.** and Bradford, M.A. "Locking-free Analysis of Shear-deformable Beams by Coupling Finite Element and Meshfree Methods", 13th international Conference on Civil, Structural and Environmental Engineering Computing, Crete, Greece, September 2011

**Erkmen, R.E.,** Bradford, M.A. and Crews, K. "Treatment of Locking Behaviour for Displacement-based Finite Element Analysis of Composite Beams", Advances in Structural Engineering and Mechanics, Seoul, Korea, September 2011

**Erkmen, R. E.** and Bradford, M.A. "Computational Modeling of Beams Curved in-plan", 10th international Conference on Computational Structures Technology, Valencia, Spain, September 2010

**Erkmen, R. E.,** Bradford, M.A. "Locking-free Finite Element Formulation for Steel-concrete Composite Members", 9th World Congress on Computational Mechanics, Sydney, Australia, July 2010

**Erkmen, R. E.,** Cimilli, S. and Gilbert, I. "Models for Inelastic Analysis of FRP Reinforced Concrete Members", 24th Biennial Conference of the Concrete Institute of Australia, Sydney, Australia, September 2009

**Erkmen, R. E.** and Bradford, M.A. "In-plane analysis of arches by using element-free Galerkin method", 12th international Conference on Civil, Structural and Environmental Engineering Computing, Madeira, Portugal, September 2009

Hamed, E., Gilbert, R.I., Bradford, M.A. and **Erkmen, R. E.** "Influence of Predicted Creep Coefficients on the Creep Buckling of Shallow Spherical Concrete Domes", 2nd International RILEM Workshop on Concrete Durability and Service Life Planning, Haifa, Israel, September 2009

**Erkmen, R. E.,** Bradford M.A. and Mohareb, M. "A Complementary Energy-based Formulation for Torsional Buckling Analysis of Columns", 20th Australasian Conference on the Mechanics of Structures and Materials, Toowoomba, Queensland, Australia, December 2008

**Erkmen, R. E.** and Bradford, M.A. "A Plastic-hinge Model for the Elasto-plastic Analysis of I-beams Curved in-Plan", 20th Australasian Conference on the Mechanics of Structures and Materials, Toowoomba, Queensland, Australia, December 2008

**Erkmen, R. E.** and Mohareb, M. "Non-orthogonal Solution for Thin-walled Members-Generalized Expression for Stresses", 8th International Conference on Computational Structures Technology, Las Palmas de Gran Canaria, Spain, September 2006

Mohareb, M., Nowzartash, F. and **Erkmen, R. E.** "Torsion Analysis of Wide-flange Beams including Shear-deformation Effects", 8th International Conference on Computational Structures Technology, Las Palmas de Gran Canaria, Spain, September 2006

## BOOK CHAPTER

**Erkmen, R. E.** and Bradford, M.A. Moving Load Analysis of Composite Beams Curved in-Plan. Chapter 8 of Trends in Civil and Structural Engineering Computation, BHV Topping et al. (eds). Kippen, UK: Saxe-Coburg, 2009, 169-186.

## BOOK

**Erkmen, R.E.** and Mohareb, M., Finite Element Formulations for Thin Walled Members, VDM Publishing, Germany, Saarbrücken, 2009, (344 pages)

## REPORT

**Erkmen, R.E.** and Attard (2010). Nonlinear in-Plane Analysis of Shear-deformable Shallow Circular Arches, The University of New South Wales, UNICIV Report R-458, p.25.

## JOURNAL REVIEW

- International Journal for Numerical Methods in Engineering
- Computers & Structures
- Journal of Structural Engineering, ASCE
- Finite Elements in Analysis and Design
- Engineering Structures
- Thin-walled Structures
- Journal of Constructional Steel Research
- Applied Mathematical Modelling
- Journal of Bridge Engineering, ASCE
- International Journal of Computational Methods
- Steel and Composite Structures
- Advances in Structural Engineering
- Inverse Problems in Science & Engineering
- International Journal of Structural Stability and Dynamics

## RESEARCH INTERESTS

- Numerical methods and computational techniques
- Analysis of composite and curved structures
- Analysis of thin-walled structures and pipes
- Structural stability and dynamics

## TEACHING INTERESTS

- Design of steel structures
- Finite element and numerical methods
- Mechanics of solids and structural analysis
- Structural stability and dynamics