

Arash Shahi, Ph.D., P.Eng., PMP

Postdoctoral Fellow

Civil and Environmental Engineering

University of Waterloo, Waterloo ON

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EDUCATION

Doctor of Philosophy, Civil Engineering – Construction Management March 2012

University of Waterloo, Waterloo, Ontario, Canada

Focus: Data Fusion for Automated Construction Management Applications (GPA: 93 %)

Certificate in University Teaching (CUT), Centre for Teaching Excellence October 2010

University of Waterloo, Waterloo, Ontario, Canada

Focus: Curriculum Development and Effective Teaching Strategies

Master of Applied Science, Civil Engineering August 2008

University of Waterloo, Waterloo, Ontario, Canada

Focus: Structural Strengthening and Rehabilitation using Fiber Reinforced Polymers (FRP) (GPA: 92 %)

Bachelor of Applied Science, Civil Engineering – Management Science Option, Structural Certificate (Co-op Program) April 2007

University of Waterloo, Waterloo, Ontario, Canada

Focus: Structural Engineering and Management Sciences

AWARDS AND SCHOLARSHIPS

- University-wide Award for Exceptional Teaching by a Student, University of Waterloo (2012)
- Natural Sciences and Engineering Research Council of Canada Alexander Graham Bell Canada Graduate Scholarship (NSERC-CGS) - \$105,000 over three years (2009- 2012)
- Natural Sciences and Engineering Research Council of Canada Postgraduate Scholarship (NSERC-PGS) - \$23,000 per year (2008-2009)
- University of Waterloo President's Scholarships \$10,000 per year (2008-2012)
- Fiatech Conference Student Scholarship (2012)
- Ontario Graduate Student Scholarship in Science and Technology (2007-2008)
- Graduated from Bachelor's program with Distinction and Dean's Honours List (2007)
- Faculty of Engineering Dean's Undergraduate Award (2006-2007)
- Natural Sciences and Engineering Research Council of Canada Undergraduate Student Research Award (NSERC-USRA) (2006)

PROFESSIONAL EXPERIENCE

Postdoctoral Fellow

May 2013-present

University of Waterloo, Waterloo, Ontario, Canada

- Conducted research, coordinated relationships with industry partners, and collaborated with other postdoctoral fellows and graduate students with respect to the following research projects:
 - Automated construction management applications, including earned-value progress tracking; automated quality control; and the use of data fusion from automated and manual information sources, including 3D laser scans, BIM, ultra-wideband (UWB), and the schedule
 - Automated material tracking and surplus management for enhanced supply chain visibility on construction projects
 - Augmented capabilities of electronic product and process modelling systems (EPPMS) for the construction industry
- Assisted in writing proposals for funding and for developing and managing relationships with current and potential industry partners and funding agencies
- Directed the activities of the Mechanical Contractors Association (MCA) Student Chapter in the Kitchener-Waterloo region and worked with local civil, construction, and mechanical contractors to attract funding and expertise for student projects at the graduate and undergraduate levels
- Served as a peer reviewer for the *ASCE Journal of Construction Engineering and Management*

Senior Product Manager

March 2012-February 2013

Coreworx Inc., Waterloo, Ontario, Canada

- Managed the development, marketing, and sales of the Cost and Performance Management product
- Worked with owners; operators; service providers; and engineering, procurement, and construction experts to align the product line to industry requirements and best practices
- Attended Construction Industry Institute (CII) research teams and meetings related to the management of projects and portfolios, including the CII Portfolio Management Research Group

Instructor – Civil Engineering Projects

May 2012-August 2012

University of Waterloo, Waterloo, Ontario, Canada

- Instructed and managed a fourth-year mandatory course for all Civil Engineering students (CIVE 400 – Civil Engineering Projects) with a class enrollment of more than 100 students
- Supervised 15 groups of undergraduate students, worked closely with their technical advisors and industry partners, and evaluated their bachelor's degree projects

Instructor – Civil Engineering Systems

September 2011-December 2011

University of Waterloo, Waterloo, Ontario, Canada

- Redesigned, developed course content, and instructed a mandatory third-year course for all Civil Engineering students (CIVE 332 – Civil Engineering Systems) with a class enrollment of more than 110 students
- Developed the majority of the course notes and was granted copyright privileges

Graduate Teaching Developer

January 2010-December 2011

Centre for Teaching Excellence, Waterloo, Ontario, Canada

- Created and delivered workshops for graduate students and faculty members on topics related to teaching higher education, including “Effective Teaching Techniques” and “Course Development”
- Facilitated and instructed numerous workshops and courses for graduate students enrolled in the Certificate for University Teaching program, with typical enrollments of 30-50 graduate students

Teaching Assistantships

University of Waterloo, Waterloo, Ontario, Canada

- Statics and Solid Mechanics September 2009-December 2009
- Structural Systems January 2009-April 2009
- Structural Analysis I January 2008-April 2008
- Structural Concrete Design I September 2007-December 2007
- Professional Development for Engineers II May 2007-August 2007
- Professional Development for Engineers I January 2006-April 2007

Real Estate Professional (Part-time)

May 2005-September 2013

Century 21 and HomeLife, Toronto, Ontario, Canada

- Specialized in investment properties, new construction projects, and residential properties
- Personally drafted and negotiated agreements for more than \$30M worth of contracts
- Managed investment properties and conducted appraisals and comparative market analysis
- Received HomeLife Gold Award for outstanding performance nationwide

Field-Office Technical Coordinator (Co-op Position)

September 2004-December 2004

Decommissioning Consulting, Richmond Hill, Ontario, Canada

- Inspected caisson drilling and concrete activities
- Supervised soil excavation, backfill, and grading
- Organized biweekly project reports, including AutoCAD plots of excavation and quantity estimates

Technical Services Representative (Co-op Position)

January 2004-April 2004

Dufferin Concrete, Etobicoke, Ontario, Canada

- Conducted laboratory experiments related to the design of self-consolidating concrete mixes
- Performed field and laboratory concrete tests
- Inspected concrete loads, pouring methods, and testing procedures

Lab-Site Technician (Co-op Position)

May 2003-August 2003

Aecon Materials Engineering, Brampton, Ontario, Canada

- Performed quality control and quality assurance profilograph testing on asphalt pavements
- Supervised the investigation and sampling of potential sites for expanded asphalt projects
- Conducted laboratory and field experiments related to asphalt pavements

SELECTED PUBLICATIONS

Refereed Journal Publications

Published Journal Papers

Arash Shahi, Carl T. Haas, Jeffrey S. West, and Burcu Akinci (2012). Workflow-based Construction Research Data Management and Dissemination. *Journal of Computing in Civil Engineering*. CPENG-705 (Accepted July 2012)

Arash Shahi, Jeffrey S. West, and Carl T. Haas (2012). Onsite 3D Marking for Construction Activity Tracking. *Journal of Automation in Construction*, 30, 136-143. DOI: 10.1016/j.autcon.2012.11.027

Arash Shahi, Afrooz Aryan, Jeffrey S. West, Carl T. Haas, and Ralph C. G. Haas (2011). Deterioration of UWB Positioning During Construction. *Journal of Automation in Construction*, 24, 72-80. DOI: 10.1016/j.autcon.2012.02.009

Arash Shahi, Jeffrey S. West, and Mahesh D. Pandey (2011). Strengthening of Gulfport 230kV Wooden Transmission Structures with Glass Fiber–Reinforced Polymer Wrap. *Journal of Composites for Construction*, 15 (3), 364-373

Submitted Journal Papers

Jiali Liu, Arash Shahi, Carl T. Haas, Paul Goodrum, and Carlos H. Caldas. Validation Methodologies for Construction Engineering and Management Research. Submitted to the ASCE *Journal of Construction Engineering and Management*, August 2013.

Mahdi Safa, Arash Shahi, Carl T. Haas, and Keith Hipel. An Automated Construction Material Management System for a Value Package Planning Approach to Construction. Submitted to the ASCE *Journal of Construction Engineering and Management*, August 2013.

Arash Shahi, Mahdi Safa, Carl T. Haas, and Jeffrey S. West. Workflow-Driven Data Fusion Framework for Automated Construction Management Applications. Submitted to *ASCE Journal of Computing in Civil Engineering*, November 2013.

In-Progress Journal Papers

Arash Shahi, James Mann, and Jeffrey S. West. Evaluation of Alternative Joint Load Transfer Devices for Jointed Concrete Pavements. To be submitted to the ASCE *Journal of Composites in Construction*, 2013.

Mahdi Safa, Arash Shahi, Mohammad Nahangi, and Carl T. Haas. Improving Construction Quality Management Systems Using 3D Imaging (LADAR and Photogrammetry). To be submitted to the ASCE *Journal of Construction Engineering and Management*, 2013.

Theses

Arash Shahi (2012). Activity-Based Data Fusion for the Automated Progress Tracking of Construction Projects. Doctor of Philosophy Thesis, Civil Engineering, University of Waterloo, Waterloo, Ontario, Canada.

Arash Shahi (2008). Strengthening of Wooden Cross Arms in 230kV Transmission Structures Using Glass Fibre Reinforced Polymer (GFRP) Wrap. Master of Applied Science Thesis, Civil Engineering, University of Waterloo, Waterloo, Ontario, Canada.

Refereed Conference Proceedings

Mahdi Safa, **Arash Shahi**, Samin Shokri, Carl T. Haas, Ralph Haas, Keith Hipel, and Joel Gray (2013). Electronic Process Management System-Based Front End Planning Tool (FEPT), *Canadian Society for Civil Engineering (CSCE)*, Montreal, Quebec, June 1st.

Mahdi Safa, Mohammad Nahangi, **Arash Shahi**, and Carl T. Haas (2013). An Integrated Quality Management System for Piping Fabrication Using 3D Laser Scanning and Photogrammetry, *30th International Association for Automation and Robotics in Construction (IAARC)*, Montreal, Quebec, August 11-15.

Arash Shahi, Carl T. Haas, and Jeffrey S. West (2012). Automated Construction Activity Assessment Using Workflow-Based Data Fusion, *Gerontechnology – ISG*ISARC 2012*, Eindhoven, Netherlands, June 28. doi:10.4017/gt.2012.11.02.317.00

Arash Shahi, Jose M. Cardona, Carl T. Haas, Jeffrey S. West, and Gary Caldwell (2012). Activity-Based Data Fusion for the Automated Progress Tracking of Construction Projects, *Construction Research Congress (CRC)*, Purdue University, May 21-23.

Arash Shahi, Kaitlin Carlson, Anthony J. Chetupuzha, Carl T. Haas, Jeffrey S. West, and Burcu Akinci (2012). Construction Research Data Management, *Construction Research Congress (CRC)*, Purdue University, May 21st-23rd.

Arash Shahi, Mahdi Safa, Shahin Karimidabadi, Hassan Nasir, and Carl T. Haas (2011). Discrete Modeling and Simulation for Optimization and Planning, *CSCE 3rd International/9th Construction Specialty Conference*, Ottawa, Ontario, June 14-17.

Afrooz Aryan, **Arash Shahi**, Jeffrey S. West, Carl T. Haas, Ralph C. G. Haas, and Gary Caldwell (2011). Evaluation of Ultra-Wideband Technology for Position Location and Progress Tracking in Indoor Construction Environments, *CSCE 3rd International/9th Construction Specialty Conference*, Ottawa, Ontario, June 14-17.

Mahmoud Ahmed, Adrien Guillemet, **Arash Shahi**, Carl T. Haas, Jeffrey S. West, and Ralph C. G. Haas (2011). Comparison of Point-Cloud Acquisition from Laser-Scanning and

Photogrammetry Based on Field Experimentation, *CSCE 3rd International/9th Construction Specialty Conference*, Ottawa, Ontario, June 14-17.

Mahmoud Ahmed, Carl T. Haas, **Arash Shahi**, Afrooz Aryan, Jeffrey S. West, and Ralph C. G. Haas (2011). Rapid Tracking of Pipe-Work Progress Using Digital Photogrammetry, *CSCE 3rd International/9th Construction Specialty Conference*, Ottawa, Ontario, June 14-17.

Arash Shahi, Jeffrey S. West, and Mahesh D. Pandey (2008). Parametric Optimization of the Strengthening of Gulfport 230kV Transmission Structures with Glass Fibre Reinforced Polymer (GFRP) Wrap, *5th International Conference on Advanced Composites Materials in Bridges and Structures (ACMBS-V)*, Winnipeg, Manitoba, Canada, September 22-24.

Arash Shahi, Jeffrey S. West, and Mahesh D. Pandey (2007). Strengthening of 230kV Wood Transmission Structures with Glass Fibre Reinforced Polymer (GFRP) Wraps, *CSCE 2007 Annual General Conference*, Yellowknife, Northwest Territories, Canada, June 6-9.

Poster Presentations

Arash Shahi, Carl T. Haas, and Jeffrey S. West. “Activity-Based Data Fusion for Construction Management Applications,” *Fiatech Annual Technology Conference & Showcase*, Miami, Florida, April 2012.

Arash Shahi, Carl T. Haas, and Jeffrey S. West. “Construction Research Data Management and Dissemination,” *Coreworx International Industry Symposium*, Kitchener, Ontario, February 2012.

MEMBERSHIPS AND CERTIFICATIONS

- **Professional Engineers of Ontario (P.Eng.)**, PEO, Ontario (License #: 100180385)
- **Project Management Professional (PMP)**, Project Management Institute, Ontario
- **Certified in University Teaching (CUT)**, Centre for Teaching Excellence, University of Waterloo, Waterloo, Ontario, Canada
- **CANDU Reactor Safety**, The Canadian Nuclear Society, Ontario, Canada
- **Effective Product Marketing**, Pragmatic Marketing, San Francisco, California, USA
- **Effective Launch Essentials**, Pragmatic Marketing, San Francisco, California, USA
- **Registered Real Estate Agent (RREA)**, The Canadian Real Estate Association (CREA)

SELECTED VOLUNTEER SERVICE

- **Advisor**, MCA Student Chapter, University of Waterloo 2012-Present
- **Student Body Rep**, Engineering Faculty Council, University of Waterloo 2010-2012
- **Councillor**, Civil and Environmental Engineering Graduate Student Association (CE2GA), University of Waterloo 2008-2012
- **VP Finance**, ISAW Student Association, University of Waterloo 2005-2007
- **Volunteer English Tutor for International Students**, University of Waterloo 2009-2011
- **Assistant Cook**, Ray of Hope – Homeless Shelter, Waterloo, Canada. 2012