Mohammed Mawlana, Ph.D., PMP

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EDUCATION

Doctor of Philosophy in Building Engineering **2015**
Concordia University, Montreal, Canada.

- Construction Engineering and Management track
- Thesis title "Improving Stochastic Simulation-based Optimization for Selecting Construction Method of Precast Box Girder Bridges."

Master of Engineering in Building Engineering **2009**
Concordia University, Montreal, Canada.

- Construction Engineering and Management track

Bachelor of Science in Civil Engineering **2006**
American University of Sharjah, Sharjah, UAE

- Minor in Engineering Management
- ABET-accredited

ACADEMIC APPOINTMENTS

Assistant Professor of Construction Management **08/2021 – ongoing**
Department of Construction Management
Thomas Jefferson University, PA, USA

Assistant Professor of Construction Management **08/2017 – 07/2021**
Department of Built Environment
NC A & T State University, NC, USA

Visiting Assistant Professor of Building Construction Science **08/2016 – 05/2017**
College of Architecture, Art, and Design
Mississippi State University, MS, USA

Adjunct Assistant Professor **01/2016 – 06/2016**
Department of Building, Civil, and Environmental Engineering
Concordia University, Montreal, Canada

RESEARCH EXPERIENCE

Founding Director of Visualization and Collaboration Lab **08/2018 – 06/2021**
Department of Built Environment
NC A & T State University, NC, USA

- The mission of this lab is twofold. The first is to study the impact of new technologies (i.e., virtual reality, 3D printing, and large multi-touch display monitors) on the student learning experience. The second fold is to improve communications and collaborations among team members.

Founding Director of Construction Research Lab **08/2017 – 06/2021**
Department of Built Environment
NC A & T State University, NC, USA

- The mission of this lab is to improve the decision-making and efficiency of construction operations using construction simulation and optimization, information modeling and representation (BIM, BrIM, CIM), quantitative risk analysis, spatio-temporal analysis, visualization (3D, 4D, VR), reality capture technologies (UAS, LIDAR, RGB, RGB-D, thermal), and lifecycle cost analysis.

Research Assistant **01/2011 – 07/2015**
Department of Building, Civil, and Environmental Engineering
Concordia University, Montreal, Canada

- Worked as part of a research group towards several joint publications.
- Conducted research on improving the performance of simulation optimization using parallel computing.
- Developed an approach for integrating simulation results with BIM-based 4D models.
- Collaborated with students on developing a method to assess the risk of Spatiotemporal clashes.
- Graded students' work and assisted in teaching a graduate course.

Visiting Researcher **01/2010 – 12/2010**
Department of Building, Civil, and Environmental Engineering
Concordia University, Montreal, Canada.

- Collaborated with students on creating BIM models of the existing and proposed Turcot Interchange.
- Studied the different contract types and construction methods of highway projects.
- Developed simulation models for the construction and demolition of bridges.

GRANTS & CONTRACTS

(1) Assessment of Barriers to Adoption of Insulating Concrete Form Technology in Residential Housing, Co-PI, HUD, $249,930, 3/2021 – 3/2024
(2) Evaluating the Transition to 3D Modeling Environment for Bridges, PI, NCDOT, $9,863, 1/2020 – 4/2020.

PUBLICATIONS

Peer-reviewed Journals

(1) **Mawlana, M.**, and Vahdatikhaki, F. (accepted). Investigating the Benefits of Using Implicit Averaging in Construction Simulation Optimization Models. *MDPI Journal of Engineering Proceedings*.
(2) Jorjam, S., **Mawlana, M.**, and Hammad, A. (2023). Stochastic Simulation of Construction Methods of Multi-purpose Utility Tunnels. *MDPI Infrastructures*.
(3) **Mawlana, M.**, and Hammad, A. (2019). Integrating Variance Reduction Techniques and Parallel Computing in Construction Simulation Optimization. *Journal of Computing in Civil Engineering.*

(4) Salimi, S., **Mawlana, M.**, and Hammad, A. (2018). Performance Analysis of Simulation-based Optimization of Construction Projects Using High Performance Computing. *Journal of Automation in Construction.*
(5) **Mawlana, M.,** and Hammad, A. (2015) "Joint Probability for Evaluating the Schedule and Cost of Stochastic Simulation Models." *Journal of Advanced Engineering Informatics*, 29(3), 380-395.
(6) **Mawlana, M.**, Vahdatikhaki, F., Doriani, A., and Hammad, A. (2015). "Integrating 4D Modeling and Discrete Event Simulation for Planning and Scheduling of Elevated Urban Highway Reconstruction Projects." *Journal of Automation in Construction*, 60, 25-38.

Peer-reviewed Conferences

(1) Vahdatikhaki, F., and **Mawlana, M.** (2017). A Framework for augmenting 4D visualization of construction Projects with scheduling uncertainties. Proceedings of the 6th CSCE-CRC International Construction Specialty Conference, CSCE 2017 Annual Meeting, Vancouver, Canada.
(2) **Mawlana, M.,** and Hammad, A. (2016). *Reducing Computation Time of Stochastic Simulation-based Optimization Model Using Parallel Computing on A Single Multi-core System*. Proceedings of the 2016 Winter Simulation Conference, IEEE, Washington, D.C., USA.
(3) Salimi, S., **Mawlana, M.**, and Hammad, A. (2015). *Performance Analysis of Simulation-based Multiobjective Optimization Using High Performance Computing*. Proceedings of the 2nd International Conference on Civil, Building, Engineering Informatics, Tokyo, Japan.
(4) Salimi, S., **Mawlana, M.**, and Hammad, A., (2014). *Simulation-based Multiobjective Optimization of Bridge Construction Processes using Parallel Computing*. Proceedings of the 2014 Winter Simulation Conference, IEEE, Savannah, GA, USA, 3272-3283.
(5) **Mawlana, M.**, and Hammad, A. (2013). *Framework for Planning and Scheduling of Elevated Highway Construction Projects Using Simulation-based Optimization*. 4th Construction Specialty Conference, CSCE 2013 Annual Meeting, Montreal, Canada.
(6) **Mawlana, M.**, and Hammad, A. (2013). *Simulation-based Optimization of Precast Box Girder Concrete Bridge Construction Using Launching Gantry*. Proceedings of the 4th Construction Specialty Conference, CSCE 2013 Annual Meeting, Montreal, Canada.
(7) Doriani, A., **Mawlana, M.**, and Hammad, A. (2013). *Simulation-Based Deterministic and Probabilistic 4D Modeling for Planning and Scheduling of Elevated Urban Highway Reconstruction Projects*. Transportation Research Board (TRB) 92nd Annual Meeting, Washington, D.C., USA.
(8) Hammad, A., Vahdatikhaki, F., Zhang, C., **Mawlana, M.**, and Doriani, A. (2012). *Towards the Smart Construction Site: Improving Productivity and Safety of Construction Projects Using Multi-Agent Systems, Real-Time Simulation and Automated Machine Control*. Proceedings of the 2012 Winter Simulation Conference, IEEE, Berlin, Germany.
(9) **Mawlana, M.**, Hammad, A., Doriani, A., and Setayeshgar, S. (2012). *Discrete Event Simulation and 4D Modeling for Elevated Highway Reconstruction Projects*. Proceedings of the 14th International Conference on Computing in Civil and Building Engineering (ICCCBE-2012), Moscow, Russia.
(10) Hammad, A., **Mawlana, M.**, and Doriani, A. (2012). *Simulation-Based Four-Dimensional Modeling of Urban Highway Reconstruction Planning*. Transportation Research Board (TRB) 91st Annual Meeting, Washington, D.C., USA.

ORAL PRESENTATIONS

(1) *Investigating the Benefits of Using Implicit Averaging in Construction Simulation Optimization Models*, 2023, 1st International Online Conference on Buildings, MDPI.
(2) *Evaluating Existing Software for Bridge Virtual Design and Construction*, 2020, NCDOT Research & Innovation Summit.
(3) *Bridge Information Modeling and 4D Modeling*, 2019, IHEEP Conference.
(4) *4D Modeling and Discrete Event Simulation for Phasing Highway Reconstruction Projects*, 2019, NCDOT Research & Innovation Summit.
(5) *Framework for Planning and Scheduling of Elevated Highway Construction Projects Using Simulation-based Optimization*, 2013, CSCE Annual Meeting.
(6) *Simulation-based Optimization of Precast Box Girder Concrete Bridge Construction Using Launching Gantry*, 2013, CSCE Annual Meeting.
(7) *Simulation of Bridge Construction and Demolition*, 2012, Cima+ Construction.
(8) *Simulation Based Optimization for Highway Rehabilitation Planning*, 2011, SNC-Lavalin.
(9) *Studying Constructability Issues Using 4D Modeling*, 2010, Ministry of Transport of Quebec.

POSTERS (* students)

(1) *Innovation Data Collection of the Built Environment, 2021 NC A &T Undergraduate Research and Creativity Symposium.
(2) *Sustainability in Construction: Proximity Hotel Case Study, 2021 NC A &T Undergraduate Research and Creativity Symposium.
(3) *Using Implicit Averaging in Construction Simulation Optimization Models*, 2019 ASCE International Conference on Computing in Civil Engineering (i3CE).
(4) *Drones Applications in Construction and Infrastructure*, 2018, Drone Mapping Event, College of Science and Technology, NC A & T State University.
(5) *Simulation-Based Deterministic and Probabilistic 4D Modeling for Planning and Scheduling of Elevated Urban Highway Reconstruction Projects*, 2013, TRB 92nd Annual Meeting.
(6) *Simulation-Based 4D Modeling of Urban Highway Reconstruction Planning*, 2012, TRB 91st Annual Meeting.