

Majdi Flah, P.Eng., M.E.Sc.

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SUMMARY

Professional Engineer and third-year PhD Candidate specializing in the durability and sustainability of concrete transportation infrastructure. Research integrates chloride transport, corrosion initiation, probabilistic machine learning, service-life prediction, and life-cycle assessment to support material selection and maintenance planning for highway, bridge, transit, and marine infrastructure.

EDUCATION

Doctor of Philosophy in Civil Engineering (Ph.D.) McMaster University	Sept 2023 - Present Hamilton, ON
Master of Engineering Science in Structural Engineering (M.E.Sc.) Western University	Jan 2019 – Aug 2020 London, ON
Bachelor of Engineering Science in Civil Engineering (B.E.Sc.) Gabes University	Sept 2013 – Sept 2018 Gabes, Tunisia

RECOGNITIONS & AWARDS

- Ontario Graduate Scholarship (OGS), \$15,000 CAD, Province of Ontario, June 2026
- Engineers Canada Manulife Scholarship, \$12,500 CAD, Engineers Canada, Sept 2025
- Teaching Assistant Merit Award, McMaster Student Union, Apr 2025
- ACI Foundation Fellowship, \$10,000 USD, American Concrete Institute, Apr 2025
- Teaching Assistant Excellence Award, \$200 CAD, Western University, Jan 2020
- Mitacs Graduate Fellowship, \$15,000 CAD, Mitacs, Jan 2019
- Mitacs Globalink Research Award, \$7,500 CAD, Mitacs, May 2018

PROFESSIONAL EXPERIENCE

Structural Engineer EKHO Infrastructure Solutions	Jun 2022 – Aug 2025 Hamilton, ON
• Designed and verified precast concrete systems for highway and transit infrastructure, including noise barriers, retaining walls, traffic barriers, pile foundations, and shallow foundations • Performed structural modeling, foundation design, and soil–structure interaction analyses using SAP2000 and L-Pile under wind, impact, lateral, and serviceability loading conditions • Applied CHBDC, AASHTO, MTO, NBCC, and OBC requirements while reviewing calculations, shop drawings, specifications, constructability constraints, and site-specific design conditions	
Structural Engineer Witzel Dyce Engineering Inc.	Jan 2022 – May 2022 Waterloo, ON
• Designed reinforced concrete, steel, and timber structural components for residential and industrial projects in accordance with applicable Canadian building code requirements	

- Conducted site inspections during excavation, foundation, and framing stages to verify construction quality, dimensional compliance, and consistency with approved structural drawings
- Reviewed reinforced concrete shop drawings, reinforcement detailing, and construction submissions to confirm structural adequacy, code compliance, and constructability

Technical Services Project Coordinator

Jan 2021 – Jan 2022

[MCON Products](#)

Ayr, ON

- Coordinated technical proposals, shop drawings, and project submissions among contractors, consultants, municipalities, and internal production teams for transportation and municipal infrastructure projects
- Prepared site-specific quantity take-offs and AutoCAD shop drawings in accordance with Ministry of Transportation Ontario and municipal design standards
- Led pre-installation coordination meetings with contractors and consultants to resolve site constraints, design discrepancies, constructability issues, and installation sequencing before construction

PUBLISHED JOURNAL ARTICLES

1. **Flah, M.,** Nehdi, M.L. (2026). Maintenance and Lifecycle Decision Sensitivity to Uncertainty in Machine Learning Calibrated Chloride Diffusion Coefficient, *Cement and Concrete Composites*
2. **Flah, M.,** Marani, A., Suleiman, A. R., & Nehdi, M. L. (2026). Durability-informed life cycle assessment of concrete through machine learning for service life prediction. *Renewable and Sustainable Energy Reviews*
3. **Flah, M.,** Ragab, M., Lazhari, M., & Nehdi, M. L. (2022). Localization and classification of structural damage using deep learning single-channel signal-based measurement. *Automation in Construction*
4. **Flah, M.,** Itzel, N., Chaabene, W. B., & Nehdi, M. L. (2021). Machine learning algorithms in civil structural health monitoring: A systematic review. *Archives of Computational Methods in Engineering*
5. Itzel, N., Marani, A., **Flah, M.,** & Nehdi, M. L. (2021). Estimating compressive strength of modern concrete mixtures using computational intelligence: A systematic review. *Construction and Building Materials*
6. **Flah, M.,** Suleiman, A. R., & Nehdi, M. L. (2020). Classification and quantification of cracks in concrete structures using deep learning image-based techniques. *Cement and Concrete Composites*
7. Chaabene, W. B., **Flah, M.,** & Nehdi, M. L. (2020). Machine learning prediction of mechanical properties of concrete: A critical review. *Construction and Building Materials*

SUBMITTED MANUSCRIPTS

1. **Flah, M.,** Nehdi, M.L. (2026). Risk-informed selection of low-carbon concrete mixtures under chloride exposure with sensitivity to functional-unit and transport uncertainty, *Submitted to Cement and Concrete Composites*
2. **Flah, M.,** Nehdi, M.L. (2026). Controlled scientific reconstruction of concrete durability datasets from literature using schema-constrained large language model workflows, *Submitted to Automation in Construction*
3. **Flah, M.,** Nehdi, M.L. (2026). Calibration-window dependence of chloride aging exponents in concrete service-life prediction. *Submitted to Cement and Concrete Composites*
4. **Flah, M.,** Nehdi, M.L. (2026). Probabilistic surface-chloride boundary control of marine concrete corrosion-initiation screening. *Submitted to Cement and Concrete Composites*

RESEARCH EXPERIENCE

Graduate Research Assistant

[McMaster University](#)

Sept 2023 – Present

Hamilton, ON

- Conducted a PhD research program on durability-informed computational decision frameworks for low-carbon concrete infrastructure under chloride exposure
- Constructed and analyzed chloride transport datasets for apparent diffusion coefficient prediction, aging coefficient estimation, and service-life modeling
- Integrated probabilistic machine learning outputs with durability-coupled environmental indicators to support mixture ranking under fixed exposure and life-cycle assumptions

Graduate Research Assistant

[Western University](#)

Jan 2019 – Aug 2020

London, ON

- Developed machine-learning-based structural damage detection methods for reinforced concrete systems using vibration-response data
- Applied structural dynamics and signal-processing methods to improve the localization and classification of damage states in civil infrastructure

Undergraduate Mitacs Research Intern

[Laval University](#)

Apr 2018 – Aug 2018

Quebec, QC

- Conducted experimental and finite-element investigations on deep foundation behavior under soil-structure interaction conditions
- Developed numerical models to evaluate load-transfer and seismic response of foundation systems

TEACHING EXPERIENCE

Graduate Teaching Assistant

[McMaster University](#)

Sept 2024 – Present

Hamilton, ON

- Delivered tutorials and technical guidance to 116 students in Steel Design and structural mechanics courses
- Supported student learning in load paths, member behavior, bolted and welded connections, and structural design calculations
- Received the McMaster Teaching Assistant Merit Award for teaching performance and student support

Graduate Teaching Assistant

[Western University](#)

Sept 2019 – Aug 2020

London, ON

- Led applied design workshops in Structural Dynamics and Steel Design for more than 120 students
- Received the Teaching Assistant Excellence Award for instructional contribution

CONFERENCE PRESENTATIONS

Student Presenter – ACI Concrete Convention, Toronto, ON, Canada

Mar 2024

- Presented PhD research on durability and sustainability of low-carbon concrete and machine learning-based durability modeling
- Participated in technical sessions and committee meetings on service life modeling and machine learning

SUMMER SCHOOLS AND SPECIALIZED TRAINING

[CIV1260 Chemistry of Cement and Concrete](#)
[University of Toronto](#)

June 2025
Toronto, ON

- Completed a 27-contact-hour graduate course and industry workshop coordinated by Professor R. Doug Hooton, covering cement manufacture, cement kiln reactions, supplementary cementing materials, cement hydration, admixture effects, cement microstructure, sulfate attack, alkali-aggregate reactions, chloride-induced corrosion, and freeze-thaw-related deterioration

[Fundamentals of Corrosion of Steel in Porous Media](#)
[ETH Zurich](#)

June 2026
Zurich, Switzerland

- Selected for a 4-day on-site doctoral course limited to 15 participants and coordinated by Professor Ueli M. Angst, focused on electrochemical corrosion principles, reactive transport in porous media, phase equilibria, thermodynamic modeling, laboratory methods, scientific debate, and field-based corrosion observations in natural and engineered porous systems

ACADEMIC SERVICE

Peer Reviewer - Advances in Civil Engineering Materials, ASTM International

Oct 2020

- Reviewed research papers in the field of concrete materials using machine learning prediction tools

UNIVERSITY SERVICE

Council Member
[McMaster Engineering Graduate Society](#)

Sept 2025– Present
Hamilton, ON

- Supported clearer communication within the graduate community by gathering student feedback, identifying shared concerns, and presenting them constructively to the council
- Contributed informed student perspectives during discussions on academic issues by reviewing proposed changes and offering evidence-based input to help ensure policies reflected student realities

Departmental Steward
[CUPE Local 3906](#)

April 2026 – Present
Hamilton, ON

- Represented Civil Engineering graduate students in the steward council and general membership meetings

PROFESSIONAL MEMBERSHIPS & AFFILIATIONS

- Professional Engineer, Professional Engineers Ontario, Mar 2025 – Present
- Young Member, RILEM, Feb 2023 – Present
- Student Member, American Concrete Institute, Sept 2020 – Present
- Student Member, American Society of Civil Engineers, Sept 2020 – Present
- Student Member, International Federation for Structural Concrete, Sept 2020 – Present