MOHAMED S. AFIFI

Adjunct Professor | University of Texas at Tyler

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Education

Doctor of Philosophy (Ph.D.), October 2021.

McGill University, Department of Civil Engineering, Montreal, QC
Supervisors: Professor Colin A. Rogers, Ph.D. and Professor Robert Tremblay, Ph.D.
Thesis: Slotted-Hidden-Gap HSS Brace Connection for Seismic Applications.

Master of Science (M.Sc.), June 2016.

The American University in Cairo, Department of Construction Engineering, Cairo, Egypt
Supervisor: Professor Mohamed Nagib Abou-Zeid, Ph.D.
Thesis: Internal Curing of High-Performance Concrete Using Lightweight & Recycled Aggregates.

Bachelor of Science (B.Sc.), February 2013.

The American University in Cairo, Department of Construction Engineering, Cairo, Egypt
Senior Project: Pre-placed Aggregates Concrete for Marine Structures

Research Interests

Artificial intelligence in structural engineering, reliability-based Structural design, machine learning, earthquake engineering, experimental testing, finite elements analysis, sustainable cities, building materials, structural resilience.

Research Experience (8+ Years)

Graduate Research Assistant, September 2016–August 2021.

McGill University, Department of Civil Engineering
Supervisor: Professor Colin A. Rogers, Ph.D.

- Assisted in preparation and submission for funding proposal and managed to get over $468,000 of funding for various projects in the laboratory.
- Developed an extensive numerical parametric study on the key factors affecting performance of SHG HSS brace connection. Results led to better understanding towards design and detailing criteria for the newly developed connection.
- Executed full-scale laboratory testing of 4 HSS braces connected using SHG connection with different configurations.
- Planned extensive materials testing to better obtain properties including plastic behaviour, damage, crack initiation and propagation as well as residual stress patterns in different elements of connection (HSS, plates and welds)
- Performed an all-encompassing sensitivity analysis which led to the recommendation of design and detailing of SHG HSS brace connection for seismic applications.

Graduate Research Assistant, February 2013–June 2016

The American University in Cairo, Department of Construction Engineering
Supervisor: Professor Mohamed Nagib Abou-Zeid, Ph.D.

- Developed 46 mix designs of High-Performance Concrete (HPC) incorporating internal curing through lightweight and recycled concrete aggregates.
- Executed experimentation of fresh (slump, air content) and hardened properties (compressive and flexural strength) as well as durability testing (creep, shrinkage and RCPT).

Teaching Interests

Engineering mechanics (statics and dynamics), Structural analysis using modern and classical methods, computer-aided structural analysis, construction and project management, construction automation, engineering materials, & sustainable construction.

Teaching Experience (12+ Years)

Adjunct Professor, 2025-Current

Department of Civil and Construction Engineering and Management, UT Tyler.

- CENG 4412 – Reinforced Concrete and Steel Design (Fall 2025).

Lecturer, 2021- 2025

Department of Civil Engineering, McGill University

- CIVE 607 – Advanced Steel design (Winter 2023)
- CIVE 602 - Finite Element Analysis (Fall 2022)
- CIVE 527 - Renovation and Preservation: Infrastructure (Fall 2021)
- CIVE 318 – Structural Engineering II (Winter 2022)
- CIVE 317 – Structural Engineering I (Fall 2021)

Graduate Teaching Assistant, 2016–2021

Department of Civil Engineering, McGill University

- CIVE 462 – Design of Steel Structures. (Fall 2019, Fall 2020)
- CIVE 385 - Structural Steel and Timber Design (Fall 2017)
- CIVE 318 – Structural Engineering II (Winter 2020, Winter 2021)
- CIVE 317 – Structural Engineering I (Fall 2017, Fall 2018, Fall 2019, Fall 2020)
- CIVE 284 – Structural Engineering Basics (Winter 2017, Winter 2018)
- CIVE 207 – Solid Mechanics (Fall 2018, Winter 2021)
- CIVE 205 – Statics (Winter 2017)

Graduate Teaching Assistant, 2013–2016

Department of Construction Engineering, The American University in Cairo.

- CENG 446 – Techniques of Planning, Scheduling and Control (Spring 2014, Spring 2015)
- CENG 441 – Introduction to Construction Management & Cost Estimating (Fall 2015)
- CENG 424 – Construction Methods and Techniques II (Fall 2013, Fall 2014)
- CENG 323 – Construction Materials & Quality Control (Spring 2014, Spring 2015, Spring 2016)

Undergraduate Teaching Assistant, 2010–2012

Department of Civil Engineering, The American University in Cairo

- CENG 423 – Construction Methods and Techniques I (Fall 2011, Fall 2012)

Industrial Experience (7+ Years)

Senior Structural Engineer. HW Lochner. Dallas, TX. Jan 2025-Current

- Bridges Engineer overlooking the Load rating and Bridge inspections contracts with TxDOT throughout Texas.

Structural Engineer. HATCH. Montreal, Quebec. Jul. 2020 – Dec. 2024

- Member of Railway Infrastructure group working on the REM Project – Montreal Light rail network (Circa $10bn).
- Periodic Inspections & Reporting of railway bridges in Eastern Canada. Rating of existing railway bridges according to AREMA.
- Design & Calculations of proposed Railway steel and concrete bridges.

Structural Engineer. VTEK Consultants. Montreal, Quebec. Jan. 2019 – Mar. 2020

- Participated in the design and detailing of multiple steel support structures for an oil refinery in Edmonton, AB. Modelled structures on SAP2000 and produced design calculation sheets, reports and drawings.

Buildings Segment Associate. LafargeHolcim. Cairo, Egypt. Mar.2013 – Aug. 2016

- Responsible for the research and development of latest concrete technologies.

Supervisory Experience

McGill University. Master of Engineering (M.Eng.) (Co-Supervision)

- Ahmad Bou Aram. 2022
- Stefania Folino. 2021
- Claudia Agozzino. 2021

McGill Summer Undergraduate Research in Engineering program (SURE)

- Leillah Sory. Summer 2020
- Jacob Burke. Summer 2019
- Mairvat Abdul Hamid. Summer 2019
- Veronica dos Santos. Summer 2018.

Professional Memberships

Member, Canadian Association for Earthquake Engineering, 2016–present
Member, Earthquake Engineering Research Institute, 2018–present
Member, Canadian Institute of Steel Construction, 2017–present
Member, Canadian Society for Civil Engineering, 2015–present
Member, American Society of Civil Engineers, 2011–present

Honours and Awards

Nominated for Engineering Class of 1890 Outstanding Teaching Award, 2022
Faculty of Engineering, McGill University
Award presented annually to recognize exceptional contributions in teaching made by Course Lecturers and/or non-Engineering McGill professors who teach engineering students.

Outstanding Teaching Assistant, 2021
Faculty of Engineering, McGill University
Award presented annually to three teaching assistants based on student nominations.

Graduate Excellence Fellowship (GEF), 2020
Faculty of Engineering, McGill University
*Valued at **$2,755** awarded to students based on nomination from respective departments.*

CEUS Outstanding Teaching Assistant, 2020
Civil Engineering Undergraduate Society (CEUS). McGill University
Award presented annually to selected teaching assistants based on student nominations.

Ruth Hoyt Cameron Fellowship, 2020
Graduate and Postdoctoral Studies unit, McGill University
*Valued at **$2,500** awarded to students pursuing a doctorate degree on the basis of academic merit.*

FRQNT Doctoral Award (B2X), 2019-2021
The Fonds de recherche du Québec – Nature et technologies (FRQNT)
*Province-wide competition award valued at **$49,000** for 2 years awarded to support excellence in research of top applicants to undertake or continue a doctoral program in engineering research.*

Medhat Haroun Award, 2017
School of Sciences and Engineering, The American University in Cairo.
*Valued at **$1,300** awarded to the best master's thesis in the school of sciences and engineering.*

McGill Engineering Doctoral Award, 2016-2019
Faculty of Engineering, McGill University
*Valued at **$96,000** for 3 years awarded based on the student's potential to make a major impact on the quality of research in the Faculty of Engineering at McGill University.*

Emil Nenniger Memorial Fellowship, 2016-2019
Faculty of Engineering, McGill University.
Awarded based on excellence of a student's academic and research record.

Outstanding Teaching Assistant, 2015
The American University in Cairo.
University-wide award presented annually to selected teaching assistants based on student nominations.

Sami Saad Laboratory Fellowship, 2014-2016
Department of Construction Engineering, The American University in Cairo.
Awarded to students working in the field of construction materials to cover tuition and fees.

University Fellowship, 2013-2015
School of Sciences and Engineering, The American University in Cairo.
University-wide award presented annually to selected students to cover tuition and fees.

Dean's List of Honour, 2009-2012
School of Sciences and Engineering, The American University in Cairo.
University-wide award presented annually to students with high academic merit.

Publications

Articles Published in peer-reviewed journals

1. **Afifi, M,** Tremblay R. Rogers, CA (2023), "Design and Detailing methodology of Slotted-Hidden-Gap (SHG) Connection for Square HSS Brace Members", ASCE Journal of Structural Engineering. Accepted - STENG-11609
2. **Afifi, M,** Tremblay R., Rogers, CA (2022), "Numerical & Experimental Investigation of Slotted-Hidden-Gap (SHG) Connection for Square HSS Brace Members", Journal of Constructional Steel Research (JCSR). 192: 107234.
3. **Afifi, M**, Moreau, R., Tremblay R. Rogers, CA (2021), "Evaluation of the behaviour and constructability of Slotted-Hidden-Gap HSS brace connections", Journal of Constructional Steel Research (JCSR). 179: 106548.
4. **Afifi, M**, and Abou-Zeid M.N. (2021), "Is Internal Curing ready for structural concrete?", Journal of Materials in Civil Engineering. 10.1061/(ASCE)MT.1943-5533.0004055
5. **Afifi, M,** and Ahmed R. (2020). "Review of Seismic Provisions: is Egypt Earthquake safe?", Springer Nature: Journal of Sustainable Civil Infrastructures. SUCI-D-20-00192.
6. Ahmed R., and **Afifi, M,** (2020). "Risk Management Methodology for Green Building Construction Projects using Fuzzy-based Multi-Criteria Decision Making", Springer Nature: Journal of Sustainable Civil Infrastructures. SUCI-D-20-00488.
7. Sakkaf, A., Ahmed R., and **Afifi, M,** (2020). "Risk Assessment Model for Green Buildings: Case Study ASCE Journal of Architectural Engineering. 1076-0431.
8. **Afifi M**, and Ismail A. (2019). "Smart Eco Home: Towards Sustainable Community Within Relevant Strategic Integrated Intelligence of Architecture" Engineering Research Journal Article 6 Vol 163.
9. **Afifi M**, and Ismail A. (2019). "Smart Building: Application of Intelligent Concept Through Upgrading Strategy and A Responsive Approach as A Catalyst of Change to Smart Integration Concept" Engineering Research Journal Article 5 Vol 163.

Articles in preparation for submission in peer-reviewed journals

1. **Afifi, M,** Tremblay R. Rogers, CA (2022), "Effect of compression induced buckling of gusset plate on the performance of Slotted-Hidden-Gap (SHG) Connection for Square HSS Brace Members", ASCE Journal of Structural Engineering. In preparation.
2. **Afifi, M,** Middleton A. Duinker, P (2022), "Effect of direct fixation steel bridges on the augmentation of the live and impact loads of light rail trains", AREMA Journal. In preparation.

Selected Papers published in peer-reviewed conference proceedings

1. **Afifi, M,** Tremblay R. Rogers, CA (2021), "Slotted-Hidden-Gap (SHG) brace connections for square hollow structural sections for seismic applications", World Conference on Earthquake Engineering (WCEE), Sendai, Japan C001069.
2. **Afifi, M,** Ahmed, R (2021), "Evaluation of seismic provisions in building codes of developing nations - case study of Egypt", World Conference on Earthquake Engineering (WCEE), Sendai, Japan C001075.
3. Wang, C**, Afifi, M,** Rogers CA (2021), Conventional construction steel braces with bearing plate energy dissipation", World Conference on Earthquake Engineering (WCEE), Sendai, Japan 2i-0070.

4. **Afifi, M,** Ahmed, R (2020), "Review of Seismic Provisions: is Egypt Earthquake safe?", 1st JIC smart cities Conference, IM-091.
5. Ahmed, R., **Afifi, M** (2020), "Risk Management Methodology for Green building construction projects using fuzzy-based multi-criteria decision-making", 1st JIC smart cities Conference, PM-121.
6. **Afifi, M,** Tremblay R. Rogers, CA (2019), "Utilizing industrial wastewater in production of concrete: Experimental and feasibility study", Canadian Society of Civil Engineers Annual Conference, Laval, Quebec. MA133
7. Ahmed, R., **Afifi, M** (2019), "Risk Management Methodology for Green building construction projects using fuzzy-based multi-criteria decision-making", 1st JIC smart cities Conference, PM-121.
8. **Afifi, M,** Abdelkader,M and Ghoneim, A (2018), "An IoT system for continuous monitoring and burst detection in intermittent water distribution networks", 2018 International Conference on Innovative Trends in Computer Engineering (ITCE), DOI: 10.1109/ITCE.2018.8316632
9. **Afifi, M** (2018), " Durability of Internally cured concrete using Recycled Concrete Aggregates: Experimental & Feasibility Study", *Canadian Society of Civil Engineers Annual Conference, Fredericton*, New Brunswick Canada, Paper No. MA33

Licensing & Certifications

ASP Health and Safety License, ASP Quebec. 2017

Workplace Hazardous Materials Information System (WHMIS), McGill University. 2017

P.Eng., Professional Engineers Ontario (PEO-100560582)

Ing., Ordre des ingénieurs du Québec (OIQ – 6042631)

PE, Texas Board of Professional Engineers and Land Surveyors (TX – 155970).

Outreach and Leadership Activities

Volunteer. Moisson Montreal Foodbank. 2020
Canada Foodbank during COVID-19 Pandemic.

Founder and President. Structural Engineering Research Group of McGill (SERGM) 2019 – 2020
Department of Civil Engineering, McGill University.

Volunteer Judge. Summer Undergraduate Research in Engineering (SURE) 2017-2021
Faculty of Engineering. McGill University.

Vice President. Construction Engineering Association 2011 – 2013
Department of Construction Engineering, The American University in Cairo.

Leader of Scouts. World Scouts Jamboree (WSJ). 2005 – 2015
Egyptian Federation of Scouts

Languages

Arabic – English – French