

HADIA AWAD, PHD, LEED® GREEN ASSOCIATE

NSERC Postdoctoral Research Associate
Construction Engineering and Management
Department of Civil and Environmental Engineering, Hone School of Construction Engineering
University of Alberta

5-380 Donadeo Innovation Centre for Engineering
9211 116 Street NW, Edmonton, Alberta Canada T6G 1H9

Cell: +1 (780) 616-0093 | Email: <haawad@ualberta.ca>

Google Scholar: <https://scholar.google.ca/citations?user=pzQM0HEAAAAAJ&hl=en>

ResearchGate: https://www.researchgate.net/profile/Hadia_Awad

ORCID iD: <https://orcid.org/0000-0002-6452-3973>

Webpage: <https://www.ualberta.ca/engineering/research/groups/modular-construction/team/post-doctoral-fellows/hadia-awad>

Citizenship Status: Canadian Citizen, eligible to work in Canada

PROFESSIONAL CAREER

NSERC PDF Award Holder (Jul 2019–Jun 2021)

- Natural Sciences and Engineering Research Council (Canada) postdoctoral fellowship is competition-based and valued at \$45,000 per year for two years.
- Department of Civil and Environmental Engineering, University of Alberta
- Construction Engineering and Management

Post-doctoral Research Associate (Aug 2018–Jun 2019)

- Department of Civil and Environmental Engineering, University of Alberta
- Construction Engineering and Management

Research and Teaching Assistant (Jan 2013–Jul 2018)

- Department of Civil and Environmental Engineering, University of Alberta
- Construction Engineering and Management

Teaching Assistant (Nov 2008–Sep 2012)

- Department of Basic Engineering and Sciences, Pharos University in Alexandria

Junior Architect (July 2008–Nov 2008)

- Mahmoud Hanafi Architects and Planners

EDUCATION

Post-doctoral Research Associate (Aug 2018–present)

- Department of Civil and Environmental Engineering, University of Alberta
- Construction Engineering and Management

Doctor of Philosophy (2013–2018)

- Department of Civil and Environmental Engineering, University of Alberta
- Construction Engineering and Management
- Thesis title: Integrating Solar PV Systems into Residential Buildings in Cold-climate Regions: The Impact of Energy-efficient Homes on Shaping the Future Smart Grid
- Graduation GPA: 4.00/4.00

Master of Science (2009–2012)

- Architectural Engineering, Alexandria University, Egypt
- Thesis title: Architectural Acoustics in Educational Facilities: An Empirical Study on University Classrooms
- Graduation GPA: 3.83/4.00

Bachelor of Science (2003–2008)

- Architectural Engineering, Alexandria University, Egypt
- Graduation project: Design of a Music Conservatory by lake Marriott in the new City of Alexandria
- Graduation GPA: 3.73/4.00

Diploma, Piano performance

(1992–2002)

- Conservatoire de Musique d’Alexandrie, Alexandria, Egypt
- Graduation grade: Theory: 100/100, Performance: 82/100

SELECTED SCHOLARSHIPS & AWARDS

NSERC PDF Award (\$90,000)

(Jul 2019–Jun 2021)

- “The NSERC Postdoctoral Fellowship (PDF) program provides support to a core of the most promising researchers at a pivotal time in their careers. The fellowships are also intended to secure a supply of highly qualified Canadians with leading-edge scientific and research skills for Canadian industry, government and institutions.” <<http://www.nserc-crsng.gc.ca>>

Faculty of Graduate Studies and Research (FGSR) Graduate Travel Award (GTA) (\$1,400)

(12–14 Nov 2017)

- 5th IEEE Conference on Technologies for Sustainability (SusTech), Phoenix, Arizona.

GSA Travel Award (\$500)

(12–14 Nov 2017)

- 5th IEEE Conference on Technologies for Sustainability (SusTech), Phoenix, Arizona.

GSA Travel Award (\$500)

(10–12 Oct 2016)

- 4th IEEE Conference on Technologies for Sustainability (SusTech), Phoenix, Arizona.

QEII Graduate (PhD) Scholarship (\$15,000)

(Sep 2016–Jan 2017)

- Queen Elizabeth II graduate scholarship is one of the most Canada-wide prestigious grants rewarding the high level of research achievement of students pursuing graduate studies.

Marcus Wallenberg Prize (MWP) 2013 Travel Grant (\$5,000)

(22–24 Sep 2013)

- This special grant was based on a Canada-wide student competition on the future of forestry-related disciplines and wood products in 2013. The MWP prize recognizes “pathbreaking scientific achievements which contribute significantly to broadening knowledge and to technical development within the fields of importance to forestry and forest industries”. Out of 400 competitors, I was successfully granted this prize.

Tempus Programme (\$2,000)

(Mar–Apr 2008)

- During my undergraduate studies I was delegated as the Alexandria University representative in the Tempus Programme for the Education, Audiovisual and Culture Executive Agency (EACEA), which brings together several universities in Egypt, Sweden, and Norway in order to evaluate the educational system offered in such universities.

LIST OF PUBLICATIONS

Journal papers

1. **Awad, H.**, Secchi, L., Gül, M., Ge, H., Knudson, R., and Al-Hussein, M. “Thermal resistance field testing and performance analysis of multi-functional panels attached to wood-frame wall systems in multiple locations in cold-climate regions” *Under Review. Submitted to Energy and Buildings for publication (April 2020).*
2. **Awad, H.**, Gül, M., and Al-Hussein, M. (2020) “Long-term Performance and GHG Emission Offset Analysis of Small-scale Grid-tied Residential Solar PV Systems in Northerly Latitudes.” *Advances in Building Energy Research Journal*, DOI: 10.1080/17512549.2020.1720812

3. **Awad, H.**, Salim, K. M. Emtiaz, and Gül, M. (2020) “Multi-objective Design of Grid-tied Solar Photovoltaics for Commercial Flat Rooftops using Particle Swarm Optimization Algorithm.” *Journal of Building Engineering*, 28, 101080
4. **Awad, H.** and Gül, M. (2018) “Optimisation of Community Shared Solar Application in Energy Efficient Communities using Monte Carlo Simulation.” *Sustainable Cities and Society*, 43, 221-237.
5. **Awad, H.** and Gül, M. (2018) “Load-match-driven Design of Solar PV Systems and Its Impact on the Grid” *Solar Energy*, 173, 377-397.
6. **Awad, H.**, Gül, M., Salim, K. E., Yu, H. (2017). “Predicting the energy production by solar photovoltaic systems in cold-climate regions.” *International Journal of Sustainable Energy*, 37, 978-998.
7. Li, H.X., Gül, M., Yu, H., **Awad, H.**, and Al-Hussein, M. (2016). “An energy performance monitoring, analysis and modelling framework for NetZero Energy Homes (NZEHS).” *Energy and Buildings*, 126, 353-364.
8. Li, Y., Yu, H., Sharmin, T., **Awad, H.**, and Gül, M. (2016). “Towards energy-efficient homes: Evaluating the hygrothermal performance of different wall assemblies through long-term field monitoring”. *Energy and Buildings*, 121, 43-56.
9. **Awad, H.**, Gul, M., Zaman, H., Yu, H., and Al-Hussein, M. (2014) “Evaluation of the thermal and structural performance of potential energy efficient wall systems for mid-rise wood-frame buildings.” *Energy and Buildings*, 82, 416-427.

Conference papers

1. Nofech, J., Narjabadifam, N., **Awad, H.**, Gül, M. “Mapping the solar roof potential of the North Campus buildings at the University of Alberta.” *Accepted for publication in the 8th Eur. Conf. Ren. Energy Sys.*, Istanbul, Portugal (Aug. 24-25, 2020).
2. **Awad, H.**, Gül, M., Mohsen, O., AbouRizk, S. (2019) “An Integrated Simulation-based Construction Crew Allocation and Trade-off with Energy and Carbon Footprint.” *International Conference on Modelling and Applied Simulation*, Lisbon, Portugal (Sep. 18-20).
3. **Awad, H.**, Gül, M., and Al-Hussein, M. (2019) “Toward community generation: Energy simulation and performance evaluation of multi-family solar PV settings for energy-efficient homes in Edmonton, Canada.” *Proceedings, Modular and Off-site Construction (MOC) Summit*, Banff, AB, Canada, May 22-24.
4. Secchi, L. **Awad, H.**, Salim, K M E., Gül, M., and Knudson, R. (2018). “Hygrothermal field testing of multi-functional wood fibre panels for residential buildings.” *Proceedings, 1st International Conference on New Horizons in Green Civil Engineering (NHICE-01)*, Victoria, BC, Canada, Apr. 25–27.
5. **Awad, H.**, Gül, M., and Yu, H. (2017). “Load-match-driven design improvement of solar PV systems and its impact on the grid with a case study.” *Proceedings, 5th IEEE Conference on Technologies for Sustainability*, Phoenix, AZ, USA, Nov. 12-14.
6. **Awad, H.**, Gül, M., Al-Hussein, M., Yu, H. (2017).”Integrating solar PV systems into residential buildings in cold-climate regions” *Proceedings, Faculty of Engineering Graduate Research Symposium, Edmonton, AB, Canada, June 27-28.*
7. **Awad, H.**, Gül, M., Ritter, C., Verma, P., Chen, Y., Yu, H., Kasawski, K., Salim, K. E., and Al-Hussein, M. (2016). “Solar photovoltaic optimization for commercial flat rooftops in cold regions.” *Proceedings, 4th IEEE Conference on Technologies for Sustainability*, Phoenix, AZ, USA, Oct. 9-11.
8. Salim, K.M.E., **Awad, H.**, Gül, M., Knudson, R., and Al-Hussein, M. (2016). “An experimental framework for investigating the hygrothermal properties of multi-functional wood fibre and XPS panels for residential buildings.” *Proceedings, Modular and Offsite Construction (MOC) Summit*, Edmonton, AB, Canada, Sep. 29-Oct. 1, pp. 266-273.
9. **Awad, H.**, Gul, M., Zaman, H., Yu, H., and Al-Hussein, M. (2014) “Evaluation of the thermal and structural performance of potential energy efficient wall systems for mid-rise wood-frame buildings.” *Proceedings, Construction Research Congress*, 2255-2265.
10. **Awad, H.**, Farag, H., Taha, D., and Hanafi, M. (2012). "Architectural acoustics in educational facilities: An empirical study on university classrooms in Egypt." *Proceedings, 164th Meeting of the Acoustical Society of America.*

WRITTEN GRANT PROPOSALS AND TECHNICAL REPORTS

Written and assisted my supervisor in writing the following grant proposals:

- “Development of a decision-making and optimization tool for residential community shared solar based on energy time share concept” Co-applicant. Cities IPCC Legacy Program (**\$50,000**).
- “An integrated simulation and optimization model for rooftop solar PV systems through maximizing load match” (May 2019) – Campus Sustainability Major Grant Application (**\$96,000**). Successfully granted for 1 year.
- “Data-driven estimating of the electrical energy flow dynamics of community shared solar PVs (CSS-PV) associated with net-zero energy ready (NZEr) communities” (May 2019) – Grant proposal submitted to NSERC Collaborative Research Development (CRD) Program (**\$150,000**). Under review
- “Mapping the solar roof potential of the North Campus buildings at the University of Alberta” (Feb 2019) – Campus Sustainability Major Grant Application (**\$50,000**). Successfully granted for 1 year.
- “Development of a decision-making and optimization tool for residential community solar based on energy flow simulation” (Feb 2019) – Grant proposal submitted to Community Generation Capacity Building Program (Energy Efficiency Alberta) (**\$225,000**).
- “Decision-support software for designing energy-efficient communities equipped with community shared solar photovoltaics and simulating their energy and GHG emission dynamics” (Feb 2019) – Grant proposal submitted to Alberta Innovates Technology Futures (AITF) Clean Technology Development (CTD) Program (**\$175,000 out of \$475,000 total project budget**).
- “Design and operation optimization tools for building integrated sustainable energy systems.” (2018) – EOI submitted to Green Infrastructure Phase II – Energy Efficient Buildings Research, Development & Demonstration Program.
- “The development of an integrated design and optimization tool for residential and commercial solar PV systems.” (2016) – Engage proposal submitted to NSERC and successfully granted (**\$50,000**).
- “Hygrothermal field testing of multi-functional wood fibre panels for residential buildings.” (2015) – Grant proposal submitted to NSERC and successfully granted.
- Awad, H., Gül, M., Al-Hussein, M. and Yu, H. (2013). “Evaluation of Energy Efficient Wall Systems for Mid-rise Wood Frame Buildings.” Progress report submitted to NSERC NEWBuildS Network.

TEACHING EXPERIENCE

Full-time Teaching Assistant

(Nov 2008–Oct 2012)

Pharos University – Alexandria, Egypt

- Instructor and lab supervisor.
- Designed course materials and exams.
- Served as Academic Advisor to establish prerequisites for undergraduate course registration.
- Peer mentoring for new Teaching Assistants.
- Graded exams.
- Ciphred and deciphered exam sheets for courses with large number of students.
- Communicated with students on a one-on-one basis during office hours.

Full-time Research and Teaching Assistant

(Fall 2017)

University of Alberta – Edmonton, Canada

- Instructor and lab supervisor.
- Communicated with students on a one-on-one basis during their term projects and assignments and fostered the students’ commitment to lifelong learning by connecting the course materials with real-life themes.
- Committed to supporting fellow researchers by participating in research seminar, sharing experience, and giving successful examples of my past publications and presentations.

Mentorship and Supervision

(May 2015 – present)

- Supervised several local and international undergraduate and graduate students.
- Supervised three MEng students on their graduation project.

- Supervised two MSc students on their research theses.
- As a PhD student and PDF at the UofA, I supervised and mentored five undergraduate interns who were recruited under my research projects:
 - Summer 2014: I mentored one intern from the Indian Institute of Technology IIT Bombay. I taught him how to use CATIA software and assigned him to model and assemble fully-detailed CNC machine parts.
 - Summer 2015: I mentored one intern from the Indian Institute of Technology IIT Bombay. He was hired under my current research project "Integrating Solar PV systems into residential buildings in cold-climate regions". He learned about solar PV performance parameters, and was assigned to develop a preliminary prediction model (using Artificial Neural Networks) to forecast solar PV power output taking advantage of the in-situ data collection in the project.
 - Winter 2016: I mentored one intern from the Federal University of Rio de Janeiro. This undergraduate student, who is specialized in meteorology, learned in detail about the solar PV performance parameters related to climate such as El Niño, La Niña, and solar irradiance, and used those parameters to improve the previously developed ANN and provide higher precision and less error.
 - Summer 2017: I participated in the hiring process (i.e. shortlisting, interviewing, etc.) and mentoring of an undergraduate summer student intern from the Computer Science department. The student's role was to develop a real-time online database to automatically download and manage online data.
 - Summer 2019: I was fully responsible for hiring (i.e. shortlisting, interviewing, etc.) and mentoring undergraduate summer students from the Electrical Engineering department through ISWEP program offered by UofA. The student's role was to develop an image recognition algorithm for object detection and elimination. This was part of a research project which aimed to autonomously detect the rooftop solar PV potential for the UofA campus buildings.
 - Fall 2019—Fall 2020: I was part of the selection committee recruiting an ECO Canada student candidate from Astrophysics Department, and, currently, the student works under my co-supervision.

INVITED & PUBLIC TALKS

University of Illinois at Urbana Champaign	(Mar 04, 2019)
"Integrating Solar PV systems into residential buildings in cold-climate regions: The Impact of Energy-efficient Homes on Shaping the Future Smart Grid"	
Student Energy at University of Alberta	(Mar 15, 2018)
"Integrating Solar PV systems into residential buildings in cold-climate regions"	
Solar Energy Society of Alberta (SESA)	(Jan 19, 2017)
"Going Solar? How to Determine the Value of a Solar Investment"	
Alexandria University, Egypt	(Jul 27, 2016)
"Success Stories in the Making– An Ongoing Series"	
University of Alberta Energy Club Talk	(Mar 30, 2016)
"Integrating Solar PV systems into residential buildings in cold-climate regions". I presented a (TEDx-style) public lecture about my research topic, "Integrating Solar PV systems into residential buildings in cold-climate regions", at the UofA "Energy Club Talks – Climate Change Leadership by Andrew Leach" on March 30, 2016.	

SELECTED MEMBERSHIPS, WORKSHOPS, AND CERTIFICATES

LEED® Green Associate (11265895-GREEN-ASSOCIATE)	(Oct 5, 2019)
Reviewer, Solar Energy Journal	
Reviewer, Energy and Buildings	
Reviewer, IEEE Access	
Reviewer, Energy Science and Engineering	
Mobile Microgrid Training Platform Workshop, Phoenix, AZ. (4 PDHs)	(Nov 12, 2017)
Board Director, Solar Power Investment Cooperative of Edmonton (SPICE)	(Sep 2017–Feb 2019)

I served as a technical advisor for building integrated solar PV systems and community shared applications, besides my roles as a Board of Directors.

Passive House Design & Construction

(Nov 2014)

Training course by the Canadian Passive House Institute (CanPHI), Edmonton, AB

Living in the Acoustic Environment

(19–20 Oct 2012)

The Acoustical Society of America (ASA) School, Kansas City, MO, USA

SUMMARY OF RESEARCH ACCOMPLISHMENTS

- Written and assisted in writing successful grant proposals and delivered numerous technical reports on various grant-funded projects.
- Authored numerous articles published in or under review by prestigious journals, including Energy and Buildings, International Journal of Sustainable Energy, Solar Energy, and Sustainable Cities and Society.
- Authored and presented numerous conference proceedings, including IEEE Technologies for Sustainability, Construction Research Congress, and Modular and Offsite Construction Summit.
- Served as a reviewer in prestigious journals such as Solar Energy, Energy and Buildings.
- Assisted my supervisors in supervising graduate and undergraduate students in several Engineering disciplines such as Civil, Architectural, Electrical, and Computer Sciences.
- Assisted my supervisors in evaluating thesis and delivering thesis evaluation reports.
- Served as Team Lead of multiple research projects related to sustainable and energy efficient buildings and communities, as well as construction management.
- Selected as a top 5 student out of 400 competitors in a Canada-wide competition in Forestry-related research to attend the Marcus Wallenberg Prize ceremony in Stockholm, 2013. Introduced to the event as the student representative of the University of Alberta.
- Awarded the Queen Elizabeth II Graduate Scholarship in 2016 for excellence in academic achievement having accomplished an outstanding GPA of 4.00/4.00 and published a considerable number of publications.
- Exceptional industrial contributions acknowledged by the industry partners, such as reports, software solutions, as well as multiple R&D services.

VOLUNTEERING & OTHER STUDENT ACTIVITIES

- At the University of Alberta, I served as an organizer in the Modular and Offsite Construction (MOC) Summit for three consecutive years (2014, 2015, and 2016) and most recently 2019. I participated in the peer-review of the manuscripts submitted to MOC 2016 and MOC/ISARC 2019, in addition to developing the program schedule and proceedings.
 - Modular and Offsite Construction Summit (May 2014)
 - Modular and Offsite Construction Summit (May 2015)
 - Modular and Offsite Construction Summit (September 2016)
 - Modular and Offsite Construction Summit and ISARC (May 2019)
- During the MOC/ISARC 2019 conference arrangements, I played a vital role in managing the paper submissions, preparing the pool of reviewers, serving as a PC member to assign papers to reviewers, identifying conflict of interests, and last but not least, reviewing manuscripts.
- I volunteer regularly at Skate Canada competitions and events, and also at my kids' field trips and school events.
- I represented Alexandria University in TEMPUS project held between Sweden and Egypt. As an undergraduate student I travelled to Sweden to evaluate the educational quality among different universities such as KTH, Lund, Benha, and Alexandria Universities. I travelled to the cities of Stockholm and Lund in Sweden over 10 days, and guided the Swedish students in Cairo and Alexandria during their stay in Egypt (Feb–Apr 2008).
- As an undergraduate student at Alexandria University, I participated in organizing the Third International Conference of the Arab Society for Computer Aided Architectural Design (ASCAAD) on “Embodying Virtual Architecture” held in Bibliotheca Alexandrina, Alexandria, Egypt from November 28–30, 2007.

REFERENCES

Dr. Mustafa Gül (Supervisor)

Associate Professor, University of Alberta
Department of Civil and Environmental Engineering
7-257 Donadeo Innovation Centre for Engineering
9211 116 Street NW, Edmonton, Alberta Canada
T6G 1H9
Tel: +1(780) 492-3002
Email: mustafa.gul@ualberta.ca

Dr. Mohamed Al-Hussein (Co-supervisor)

Professor, University of Alberta
Department of Civil and Environmental Engineering
7-295 Donadeo Innovation Centre for Engineering
9211 116 Street NW, Edmonton, Alberta Canada
T6G 1H9
Tel: +1(780) 492-0599
Email: malhussein@ualberta.ca