

Ahmed Saleh Dalaq

Nationality: Jordanian

Montreal, Canada

+9715 03167679 (UAE)

+1 514 623 7679 (Canada)

as.dalaq@gmail.com (personal)

ahmed.dalaq@mail.mcgill.ca (McGill)

MSc GPA : 3.88/4.00

BSc GPA : 3.53/4.00

Work Experience

2015-Present	Graduate research assistant at McGill University, Montreal, Canada. ¹
2015-2015	Static equipment engineer appointed in engineering division, mechanical department, static equipment section at the National Petroleum Construction Company (NPCC), Abu Dhabi, UAE. ² <ul style="list-style-type: none">- Design of pressure vessels against internal pressure, external pressure, wind load, seismic load, while ensuring safe operation of nozzles (add padding if required).- Create a full CAD model for the final approved pressure vessel design.- Preparation of bill of materials (BOM) and purchase requisition (PR) of mechanical equipment; such as filters, vessel internal components.
2013-2015	Graduate research assistant (RA) at Masdar Institute of science and technology (MI). ³
2014-2015	Lecturer for an honoring program called “Iktashif” in Masdar Institute (MI) for 3D-printing technology and demonstrated the printing and cleaning process for the guests using object Connex 260, spring 2015.
2014-2015	Teacher Assistant (TA) for Advanced engineering mathematics course—a master course at Masdar Institute (MI), responsible for grading and delivering Matlab review sessions.
2013-2014	Lecturer for an honoring program called “Iktashif” in Masdar Institute (MI) for 3D-printing technology and demonstrated the printing and cleaning process for the guests using object Connex 260, spring 2014.
2012-2013	Summer internship session for 50 days, 8 hours per day, 5 days per week. Assigned as a trainee in Abu Dhabi Company for Onshore oil operations (ADCO). Positioned at Engineering & Project Division, Piping and routing of Pipelines, conducted <i>stress analysis</i> using Caesar II .
2012-2013	Grader for <i>Finite Element Analysis</i> (FEA) course in the American university of Sharjah (AUS) for spring semester 2013.
2012-2013	Grader for Fluid Mechanics course in the American university of Sharjah (AUS) for spring semester 2012.

¹ Part of the Philosophy of doctorate (PhD) degree.

² Industrial experience involves the design of pressure vessels.

³ Part of the Master’s (MSc) degree .

2011-2012 Grader for Heat Transfer Course in the American university of Sharjah (AUS) for Fall semester 2011.

Education and academic record

2013-2015 Masters of science degree (MSc) in Mechanical engineering from **Masdar Institute of science and technology (MI)**, Energy Centre, Mechanical and Materials Engineering Department, Masdar City, Abu Dhabi, UAE.

2009-2013 Bachelors of science degree (B.S) in Mechanical Engineering from the **American University of Sharjah (AUS)** with cum loude ⁴, mechanical Engineering Department, Sharjah, UAE.

2007-2009 Attained A-level (GCE), AS-level (GCE) with concentration on mathematic, physics and chemistry from Edexcel and IGCSE from Cambridge international examination board, UK. Schooled in **Al Nahda National School**, Abu Dhabi, UAE.

International certificates

2013-2015 Certificate of completion of Masters of Science (MSc) in mechanical engineering through Masdar institute of Science and technology and **Massachusetts institute of technology (MIT)** collaboration program. (<http://web.mit.edu/mit-mi-cp/>).

2015-2015 International General certificate of occupational health and safety from the **National Examination board in occupation safety and health (NEBOSH)**, 2015, London, UK.

2013-2014 Fundamental of Engineering (FE) certificate from the **National Council of Examiners for Engineering and Surveying (NCEES)**, USA.

2008-2009 Terry fox run foundation certificate for volunteering in the run.

Awards

2016-Present Recipient of **McGill Engineering Doctoral Award (MEDA)**, include and composed of the following fellowship and funds: Clifford Pang Doctoral Fellowship, David Kerr Engineering Graduate Studies Fund, Heller Family Fellowship, and Engineering Class of 1936 Award.

2014-2015 Nomination of my master's thesis for the mechanical department best master thesis award.

2013-2014 Full scholarship was awarded for Master's degree in Masdar institute of science and technology (MI).

2013-2012 American University of Sharjah (AUS) chancellor's list certificate for Fall-Spring 2012.

2013-2012 American University of Sharjah (AUS) Dean's list certificate for Spring 2012.

⁴ Latin for "with honor"

2013-2012 American University of Sharjah (AUS) Dean's list certificate for Fall 2012.

2009-2010 Merit scholarship, 10% off from the tuition fees.

Journal publications

- **A. S. Dalaq**, D. W. Abueidda, R. K. Abu Al-Rub, **2016**, “Mechanical Properties of Interpenetrating Phase Composites with Architected 3D Solid-Sheet Reinforcements using Triply Periodic Minimal Surfaces” *Composites Part A: Applied Science and Manufacturing*, (Under Review).
- **A. S. Dalaq**, D. W. Abueidda, R. K. Abu Al-Rub, and I. M. Jasiuk, **2016**, " Finite element prediction of effective elastic properties of interpenetrating phase composites with architected 3D sheet reinforcements," *International Journal of Solids and Structures*, (Accepted).
- Abueidda, D. W., R. K. Abu Al-Rub, **A. S. Dalaq**, Dong-Wook Lee, Kamran A. Khan, I. M. Jasiuk, **2016** “Effective conductivities and elastic moduli of novel foams with triply periodic minimal surfaces” *Mechanics of Materials* (Accepted).
- **Dalaq, A.S.**, Ranganathan, S.I., **2015**, “Invariants of mesoscale thermal conductivity and resistivity tensors in planar random checkerboards” *Engineering Computations*.
- **Dalaq, A.S.**, Ranganathan, S.I., Ostoja-Starzewski, M., **2013**, “Scaling Function in Conductivity of Planar Random Checkerboards,” *Computational Materials Science*.
- Abueidda, D. W., Abu Al-Rub, R. K., **Dalaq, A. S.**, Younes, H. A., Amal A Al Ghaferi, Tushar K Shah, **2015** “Electrical conductivity of 3D periodic architected interpenetrating phase composites with carbon nanostructured-epoxy reinforcements”, *Composite Science and Technology*.
- D. W. Abueidda, **A. S. Dalaq**, R. K. Abu Al-Rub, and I. M. Jasiuk, **2015**," Micromechanical finite element predictions of a reduced coefficient of thermal expansion for 3D periodic architected interpenetrating phase composites," *Journal of Composite Structures*.
- Abueidda, D. W., **Dalaq, A. S.**, Abu Al-Rub, R. K. and Younes, H. A., **2014** “Finite element Predictions of effective multifunctional Properties of interpenetrating phase composites with novel triply periodic solid shell Architected Reinforcements,” *International Journal of Mechanical Sciences*.
- Essam M. Wahba, Mohamed Gadalla, Diab Abueidda, **Ahmed Dalaq**, Hashim Hafiz, Khaled Elawadi & Ryan Issa, **2014**, “On the Performance of Air-Lift Pumps: From Analytical Models to Large Eddy Simulations”, *ASME*.

Conference publications and presentations

- **Dalaq, A. S.**, Abueidda, D. W, Abu Al-Rub, R. K., **2015**, “Micromechanical Computational Evaluation of Triply Periodic Minimal Sheet Reinforcements for Creating Architected Composite Materials”, SD2: mechanical engineering, Graduate student research conference (GSRC), UAE.
- **Dalaq, A. S.**, Abueidda, D. W, Abu Al-Rub, R. K., **2015**, “A Full Exploration of Novel Triply Periodic Minimal Surface Architectures as a Material Reinforcement”, *ASME*.
- Jason Bassett, Mahmoud Shahin, **Ahmed Saleh Dalaq**, Dana Suwan, **2015** “An Assessment of Ocean Wave, Thermal and Salinity Energy Potential in the Junction of the Arabian Gulf and the Gulf of Oman”, *IEEE 15th meeting*.

- Abueidda, D. W, **Dalaq, A. S.**, Abu Al-Rub, R. K., **2015**, “Thermal and Electrical Properties of Interpenetrating Phase Composites with Novel 3D Triple Periodic Solid Sheet Inclusions”, ASME.
- Abueidda, D. W, **Dalaq, A. S.**, Abu Al-Rub, R. K., **2015**, “Conductivity of Inperpenetrating Phase Composites Based on Triply Periodic Minimal Surfaces Architectures”, GSRC, UAE.
- **Dalaq, A. S.**, Abueidda, D. W, Abu Al-Rub, R. K., **2014**, “Finite Element Prediction of Effective Elastic Properties of Micro/Nano-Architected Interpenetrating Phase Composites”, Mechanics of solids, structures and fluids, polymer nanocomposites and nanostructured materials: simulations and experiments, ASME.⁵
- Abueidda, D. W, **Dalaq, A. S.**, Abu Al-Rub, R. K., **2014**, “ Three-Dimensional Architected Interpenetrating Polymer Phase Composites with Superior Thermal Conductivity”, ASME
- Ranganathan, S.I., **Dalaq, A.S** , Ostoja-Starzewski, M., **2013**, “Invariants of Mesoscale Thermal Conductivity and Resistivity Tensors in Planar Random Checkerboards” School of Engineering, Brown University, SES 50th Annual Technical Meeting and ASME-AMD Annual Summer Meeting.

Book Chapters

- R. K. Abu Al-Rub, D. W. Abueidda, and **A. S. Dalaq**, "Thermo-electro-mechanical properties of interpenetrating phase composites with periodic architected reinforcements," in Advanced Material Modelling: From Creep Damage Mechanics to Homogenization Methods. vol. Advanced Structured Materials, A. Öchsner, L. F. M. Silva, and H. Altenbach, Eds., ed Germany: Springer, **2015**, pp. 1-19. (<http://www.springer.com/de/book/9783319194394>).

Patents and Inventions

- R. K. Abu Al-Rub, **A. S. Dalaq** and D. W. Abueidda, “Strong and Tough Interpenetrating Phase Composites Based on Triply Periodic Minimal Sheet Reinforcements Fabricated using Additive Manufacturing”, U.S. patent disclosure application, May 28, **2015**.
- Abu Al-Rub, R.K., Abueidda, D.W., **Dalaq, A.S.**, “Interpenetrating phase composites with three-dimensional periodic architected sheet reinforcements for low coefficient of thermal expansion,” U.S. patent disclosure application, May 28, **2015**.
- Abu Al-Rub, R.K., Abueidda, D.W., **Dalaq, A.S.**, “Electrically and thermally conductive interpenetrating phase composites with carbon nanostructured and 3D architected periodic sheet reinforcements,” U.S. patent disclosure application, May 28, **2015**.
- R. K. Abu Al-Rub, D. W. Abueidda, and **A. S. Dalaq**, "Damage-Tolerant and Multifunctional Interpenetrating Phase Composites with Three-Dimensional Periodic Architected Sheet Reinforcements", U.S. patent disclosure application, November 13, **2015**.

Major academic projects

2013-2015 Master’s thesis: Architecture of materials at micro-scale, employing novel triply periodic minimal sheets (TPMS), as unit cells, mechanical properties was predicted using computation models (*finite element analysis*) and experimentally

⁵ Technical presentation in ASME 2014 International Mechanical Engineering Congress and Exposition, Canada, Montreal website: <http://www.asmeconferences.org/Congress2014/PaperAccepted.cfm?NoToolBar=yes>

using *tensile testing*. Where unit cells were manufactured using *3D-printer* Conex 260.

- 2012-2013** Senior design project II, Conducted a *large eddy simulation* for the airlift pump system, and thus, designed and a full mobile experimental setup was built.
- 2012-2013** Senior design project I, creating *computational fluid dynamics* models (CFD) for the airlift pump system using **Ansys**.

Masters level academic projects

- 2013-2014** A **Matlab** code was developed to assess the thermal, carnot, practical efficiencies, and temperature gradient at various location in the immediate surroundings of UAE. Thus, ocean thermal energy conversion (OTEC) potential was assessed, with concentration on Hurmuz.⁶
- 2013-2014** Design a business plane for a hypothetical company called Allien's composites.
- 2013-2014** *Percolation threshold* for *thermal conductivity* was investigated for a random checkerboard microstructures—an idealization for random microstructure at the *mesoscale*. The *percolation threshold* of 0.59 was verified computationally using **Abaqus** (FEA).
- 2013-2014** Conventional periodic composites were modeled under *elasticity* settings. Spherical and fiber periodic composites was represented using *unit cell approach*. Each unit cell was modeled computationally using **Abaqus** (FEA) and their effective *Young's* and *bulk modulus* were predicted and compared with analytical models such as *mixture theory*, and *Hashin and Shtrikmann*.
- 2013-2014** The literature was surveyed to improve conventional power cycles, the proposed improvement was modelled using **Engineering Equation Solver** (EES), while *first* and *second law efficiencies* were compared.
- 2013-2014** *Navier Stokes equation* idealized using *potential flow theory* and solved using *Panel Method*, a **Matlab** code was developed and an executable application was made for a user friendly interface, *Streamlines*, *velocity vector field* and *pressure fields* were reported for any desired geometry input to the software.

Bachelors level academic projects

- 2012-2013** Conducted a *modal analysis* for a *cantilever*, using **Ansys** vibration tool box.
- 2012-2013** Developed fully generic **Matlab** code that supplies *modal frequencies*, *mode shapes*, and structure's *displacement* with time.
- 2012-2013** Conducted a *finite element analysis* (FEA) on bridge composed of a *truss element*.⁷

⁶ This work is published in IEEE conference.

⁷ As a part of finite element grading.

- 2012-2013** Conducting feasibility Study on variety of renewable energy systems and options. Implemented *net present value* approach to check system's feasibility.
- 2011-2012** *Finite difference* to determine the Deflection of a *simple supported beam* subjected to a *uniform distributed load*. The full project code was implemented in **Matlab**.
- 2011-2012** Formulating a finite element approach called *Rayleigh Ritz* method for a tapered beam using a fully generic **Matlab** code that calculates the deflection upon adding a *distributed load*. The program was generalized for “N” segments.
- 2011-2012** Inspection, analysis and redesign of power cable truss of **Hydro-Quebec** incident, a **Matlab** code was made to check the safety of each and every member in the truss. The code is designed to give out *safety factor* of different possible designs. Each member was marked and hence, failure are pointed by these markers.
- 2011-2012** FEM Model Calibration and Convergence: 2D steady state heat conduction. A **Matlab** code was supplied and used to model and mesh the 2D domain. Later contours were plotted and results of flux and temperatures were extracted within each element. Results were compared by **SS-Conduct** and **Abaqus**.
- 2011-2012** Design controller for an Unmanned Free-Swimming Submersible (UFSS) vehicle. *PD, PI, PID, Lead, Lag, Lead-Lag* controller were designed fully to satisfy the required *transient response* and error. *Root locus* and *bode plot* approaches were used. The whole project was implemented in **Matlab** environment.
- 2011-2012** Design a car deferential, all sequence of design procedure were set on **Matlab** and hence reiteration in design was made possible.
- 2010-2011** Analysis for a steam power plant based on *Rankin cycle* associated with *reheating* and *regeneration*. Parametric analysis for efficiency and boiler, by conducting an optimization using **EES** to determine the optimum *bleeding pressure* from the turbine connected with *open feed water heater*.
- 2010-2011** Numerical analysis for a chimney assuming a steady heat conduction. Analysis was conducted by using *finite divided difference* method on **EES** environment. The sole task of the project is to examine the *boundary temperatures* upon changing the *emissivity*.
- 2010-2011** An article titled as “Laws and logic versus fawning fantasy” that defies the possibility of violating *first* and *second law of thermodynamics* in order to create a *perpetual motion machine*.
- 2010-2011** Drawing a 2D figure on the face of wooden peace on **CNC** machine.
- 2010-2011** Prepared a 20 pages report of finite element general applications and mechanical design in particular.
- 2010-2011** Employed **Autodesk inventor** and **Ansys** to modelling a rode with a hole orthogonal to its axis in order to extract and study the *stress concentration* for 10

specimens of different sizes and developed *stress concentration* chart for the critical zones.

Special elective courses⁸

- **Continuum Mechanics** (MSc).
- Advanced Engineering Mathematics (MSc).
- **Thermal and Mechanical Properties of Materials** (MSc).
- Computational Fluid Dynamics (B.S).
- **Applied Finite Element Analysis** (B.S).
- Advanced Mechanics of Materials (B.S).
- **Scaling in Random Composites** (B.S).
- Mechanical Vibration (B.S).
- Energy Conservation (B.S).

Memberships and external projects/activities

- Participated in Dubai EXPO 2020 logo competition in May 2015.
- Operationsmile member, volunteered in this organization to support kids suffering from *lips cleft*.
- Renewable energy society (RES) in the American university of Sharjah (AUS), I was the cofounder of the club.
- American society of mechanical engineers (ASME) member in the American university of Sharjah (AUS).

Soft Skills

Environments	Windows 8, 7, Vista, XP, ME, 98.
Programing languages	Matlab, C, G-coding.
Documentation programs	Microsoft word, excel, power point, Lyx (latex).
FEA software	Abaqus, Ansys (CFX, Fluent, Workbench, vibration tool box), Hyperwork. Caesar II.
CAD software	Autodesk Inventer (3D), Autodesk autocad (2D), Solid works (3D), SE-Fit, Geomagic.
Miscellaneous software	PV-Elite, EES, Microsoft calculator, lab view, Adobe illustrator.
Languages	Arabic (mother tongue), English (fluent)

Practical Skills

- Extensive SEM microscopy training in Masdar Institute microscopy center.
- Operating Instron machine to conduct *tensile testing* to characterize material properties.

⁸ Course in bold indicates my specialization and field of research and publications.

- Operating object Conex 260 3D printer.
- Building UAV wings using carbon fibers.
- Logo design using **Adobe illustrator**.
- Basic plumbing.
- Basic carpentry.

Personal Interests

- Philosophy
- History (Japanese history)
- Fishing
- Humanity
- Volunteerism
- Arabic calligraphy

References

Documents and references are available upon request.