Mustapha Makki

CONTACT

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United Stated

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Website

SKILLS

- MATLAB Programming
- Fortran Programming
- Python Programming
- Java Programming
- ABAQUS
- COMSOL
- LabVIEW
- Catia V5
- SOLIDWORKS
- Unreal Engine 4
- Unity 3D
- Microsoft Office
- Design of Experiments
- Finite Element Analysis (FEA)
- Finite Element Modeling (FEM)
- Communication
- Leadership

LANGUAGES

ENGLISH

ARABIC

FRENCH

PROFILE

Motivated, self-directed Graduate with exceptional verbal and written communication skills. Invests passion and commitment to achieve corporate vision. Applies analysis, lean methodology and latest technology to lead change and tackle new projects and ideas.

EDUCATION

Dec 2022
Dearborn, Michigan

Ph.D. in Industrial and Systems Engineering

University of Michigan - Dearborn
Cumulative GPA: 4.00/4.00

Dec 2016
Beirut, Lebanon

Master of Engineering in Mechanical Engineering

American University of Beirut
Cumulative GPA: 3.89/4.00

May 2014
Doha, Qatar

Bachelor of Science in Mechanical Engineering

Texas A&M University
Minor in Mathematics.

WORK HISTORY

Graduate Student Research Assistant Dearborn

Supervisor Dr. Georges Ayoub
University of Michigan – Dearborn
Sep 2019 – Dec 2022

- Developed and conducted an experimental plan for charging and discharging lithium-ion batteries at different charging speeds and number of cycles to study the mechanisms of degradation in lithium-ion batteries.
- Performed microstructural (FTIR, XPS, and SEM) and mechanical (Uniaxial and biaxial loading) characterization of the semi-crystalline polymer separators to understand the degradation mechanisms during battery cycling.
- Developed an anisotropic continuum damage mechanics model (FEM) to predict the mechanical and failure of polymeric separators to help guiding cell design, pack assembly, and improving safety of lithium-ion batteries.
- Implemented a multi-physics model to predict the stresses in polymeric separators in lithium-ion batteries under different charging conditions to assess the longevity of the separator.
- Documented and submitted papers to peer-reviewed journals.

Graduate Student Instructor Dearborn

University of Michigan – Dearborn
Sep 2018 – Apr 2022

- Organized various class presentations and new course materials.
- Participated in lesson planning and curriculum implementation.
- Directed students in performing and completing assigned tasks.
- Instructed the laboratory sessions for the following courses:
    - IMSE 382: Manufacturing processes.
    - IMSE 4835: Computer-aided process design and manufacturing (Catia V5, Mastercam, OpenCIM).
    - IMSE 4825: Industrial controls (LabVIEW, Arduino, PLCs).
    - IMSE 381: Industrial robots (Robot programming, Fanuc).

Metal Forming Researcher Intern Dearborn

Ford Motor Company
Jun 2019 – Aug 2019

- Developed an anisotropic time-dependent continuum damage model to predict the mechanical and damage behavior of ductile metals.
- Implemented the model in finite element and validated it on uniaxial loading tests conducted on 6xxx series aluminum alloy sheets.
- Coded an optimization algorithm (Nelder-Mead) to find the modelling parameters.

Mechanical Engineering Senior Research Associate Doha, Qatar

Texas A&M University at Qatar
Jan 2018 – Jul 2018

- Developed a virtual application that investigates the attentional behavior patterns of children with autism spectrum disorder.
- Performed microstructural (SEM) and mechanical (Tensile testing) characterization of magnesium alloys.
- Simulated friction stir welding between two steel plates using a Eulerian-Lagrangian model in finite element.

Mechanical Engineering Research Assistant-Associate Doha, Qatar

Texas A&M University at Qatar
Apr 2017 – Dec 2017

- Introduced virtual and mixed reality tools applications to promote active learning in engineering.
- Created a methodology to baseline the visuospatial skills of students.
- Designed a virtual reality application for crystal structures on Oculus Rift using Unreal Engine 4 to improve the students' overall learning experience.
- Designed a mixed reality application using Unity on Hololens that allows the examination of different crystal structures such as metals, ceramics, and polymers to help enhance students' visuospatial skills.

Graduate Research Assistant Beirut, Lebanon

American University of Beirut
Jun 2015 – Dec 2016

- Developed a simulation tool to predict the mechanical behavior of semi-crystalline polymers under cyclic loading.
- Implemented a crystal plasticity model to predict the mechanical behavior and texture evolution in equal channel angular pressing.

- Performed extensive literature review on the microstructure, mechanical behavior, and modelling of semi-crystalline polymers.

Student Research Assistant

Texas A&M University at Qatar — Doha, Qatar
Jan 2013 – May 2014

- Conducted experiments in Engine Lab to produce experimental results necessary for model development and validation.
- Developed a Single Input Single Output model for single-injection diesel engine using system identification.
- Assisted in the developing of a sliding mode controller to control torque output via fuel flow rate at constant speeds.

Student Research Assistant — Doha, Qatar

Texas A&M University at Qatar
Jan 2012 – May 2014

- Assisted in developing an accurate and robust detection technique that can be used to identify heart abnormalities; specifically heart attack.
- Performed a literature review of current work on heart attack detection.
- Created and designed an android phone application (Java) to acquire and plot ECG signals via Bluetooth.
- Created a webserver that receives ECG signals and analyzes them through a MATLAB algorithm.

Mechanical Engineering Intern — Doha, Qatar

Commodore Contracting
May 2013 – Jun 2013

- Reviewed and checked technical drawings by architectural technicians, CAD technicians and drafters.
- Complied with government and corporate safety policies and regulations.

ACCOMPLISHMENTS

Certificate of Distinction 2013
Spring 2013

- In exhibiting Leadership, Service, Integrity, Respect and Loyalty as a student employee at Texas A&M University at Qatar.

Dean's Honor roll
Spring 2012 & Fall 2013

- Outstanding academic achievement.

3D Challenge at Texas A&M University at Qatar
May 2017

- Second place in the visualization development competition of the 3D challenge 2017.

Certificate of Achievement Qatar National Research Fund
April 2018

- Second place in the Best Representative Image of an Outcome (BRIO).

Certificate of Appreciation by University of Michigan – Dearborn
April 2019-2021

- Outstanding contribution to teaching, research, scholarship, and service.

AFFILIATIONS

Student Body Government, President
Jan 2013 – Dec 2013

- Represented Texas A&M University at Qatar Student Body Government in all matters outside the university.
- Participated in conferences: Student government association (COSGA) and American student government association (ASGA).
- Facilitated student government involvement in co-programming with other organizations.
- Coordinated group activities and communicated with officers and Student Affairs department on all matters.

Student Body Government, Representative
Sept 2011 – Dec 2012

- Looked after the students' needs and helped them solve their problems.
- Represented the students' feelings, opinions, and interests by being the bridge of connection between the student body and the administration.
- Encouraged leadership qualities, organizational skills, and responsibility in the student body.
- Represented the students outside the university.

Student Body Government, Head of events committee
Sept 2011 – May 2012

- Worked together with the events committee chairs to ensure that events are proceeding accordingly.

Student Body Government, Secretariat
Sept 2012 – Dec 2012

- Recorded minutes at all meetings and provided the SBG members with the important minutes.

Shell Eco Marathon, Team member
May 2012 – July 2012

- Worked on a battery and a GTL fuel operating vehicle.
- Designed chassis for the battery operating vehicle.
- Designated the type of material to use for the chassis.

Pie Tau Sigma, Member
Sept 2012 – Present

- Mechanical engineering honor society.

Alpha Pi Mu, Member
April 2022 – Present

- Industrial engineering honor society.

PUBLICATIONS

Journal articles:

- Makki, M., Ayoub, G., Abdul-Hameed, H., Zairi, F., Mansoor, B., Nait-Abdelaziz, M., Ouerdini, M., Zairi, F., 2017. Mullins effect in polyethylene and its dependency on crystal content: A network alteration model. Journal of the Mechanical Behavior of Biomedical Materials, doi: https://doi.org/10.1016/j.jmbbm.2017.04.022.
- Banire, B., Al Thani, D., Qaraqe, M., Mansoor, B., Makki, M., 2020. Impact of mainstream classroom setting on attention of children with autism spectrum disorder: an eye-tracking study. Universal Access in the Information Society. doi: https://doi.org/10.1007/s10209-020-00749-0.
- Ayoub, J., Avestisyan, L., Makki, M., Zhou, F., 2021. An Investigation of Drivers' Dynamic Situational Trust in Conditionally Automated Driving. IEEE Transactions on Human-Machine Systems. doi: https://doi.org/10.48550/arXiv.2112.04095.
- Makki, M., Ayoub, G., Lee, C.W., 2023. Modeling the anisotropic behavior of highly orthotropic lithium-ion batteries polymer separators, International Journal of Solids and Structures, doi: https://doi.org/10.1016/j.ijsolstr.2022.112102.

Journal articles (Under review and to be submitted):

- Makki, M., Ayoub, G., Pannier, C., Dargazany, R., Kadri, R., Nait Abdelaziz, M., Nouri, H., 2023. Micromechanical modelling of the visco-hyperelastic-viscoplastic behavior and fracture of aged semi-crystalline polymers *(Under review: Mechanics of Materials)*.
- Ayoub, G., Makki, M., Kadri, R., Dargazany R., Nait Abdelaziz, M., 2023. Micromechanical modelling of the effects of crystal content on the visco-hyperelastic-viscoplastic behavior and fracture of semi-crystalline polymers *(Under review: International Journal of Non-Linear Mechanics)*.
- Makki, M., Ayoub, G., Lee, C., 2023. Effect of battery charge-discharge cycles on the aging of lithium-ion battery separator *(To be submitted to Journal of Power Sources)*.
- Makki, M., Lee, C., Ayoub, G., 2023. Multi-physics continuum damage mechanics modelling of a pouch cell battery during charge-discharge cycling *(To be submitted)*.

Conference papers:

- Makki, M., Saade, G., Altouma, A., Al-Terkawi, S., Baobeid, A., Tafreshi, R., 2014. Acquiring and analyzing electrocardiograms via smartphone to detect cardiovascular abnormalities, in: 2014 IEEE-EMBS International Conference on Biomedical and Health Informatics, BHI 2014.
- Mansoor, B., Makki, M. J., Al-Thani, D. (2018, June), Use of Mixed Reality Tools in Introductory Materials Science Courses. Paper presented at 2018 ASEE Annual Conference Exposition, Salt Lake City, Utah.
- Makki, M., Ayoub, G., Ilinich, A., Kridli, G., Anisotropic Time-Dependent Continuum Damage-Coupled Plasticity Model for Predicting Ductile Fracture of 6xxx Series Aluminum Alloys, in: Numisheet 2022, pp. 15–24.

Book Chapters:

- Banire, B., Al Thani, D., Makki, M., Qaraqe, M., Anand, K., Connor, O., Khowaja, K., Mansoor, B., 2019. Attention Assessment: Evaluation of Facial Expressions of Children with Autism Spectrum Disorder. Universal Access in Human-Computer Interaction. Multimodality and Assistive Environments, in: Antona, M., Stephanidis, C. (Eds.). Springer International Publishing, Cham, pp. 32–48.

CONFERENCE PRESENTATIONS

- Mustapha Makki, Marwa Abdel Gawad, Mohammad Hasiri, Ali Sheharyar and Bilal Mansoor, Use of 3D virtual reality to enhance student learning experience in STEM courses. Poster in: Transformative Educational Experience Showcase - Texas A&M University at Qatar, Nov 7, 2017, Doha, Qatar.
- B. Mansoor, M. Makki, M. Hasiri, M. Abdelgawad, A. Sheharyar, T. Ozkan, Development of immersive virtual reality tools to enhance student learning experiences. 3D Challenge – organized by Texas A&M University at Qatar, May 21, 2017, Doha, Qatar.
- Mustapha Makki, Georges Ayoub, Andrey Ilinich, Jackie Ayoub, and Ghassan Kridli, Anisotropic and Time-Dependent Continuum Damage Coupled Plasticity Model for Predicting Ductile Fracture of AA 6xxx in Materials Science and Technology, September 30, 2019, Portland, Oregon, USA.

REFERENCES

- Dr. Georges Ayoub - Assistant Professor, Director of the Human-Centered Engineering Design program (PhD Advisor).
    - Email: gayoub@umich.edu
    - Phone number: 313-436-9130.
- Dr. Ghassan Kridli - Dean at the College of Engineering and Computer Science (PhD Committee Member).
    - Email: gkridli@umich.edu
    - Phone number: 313-593-5467.
- Dr. Andrey Ilinich – Technical Specialist, Lightweight Materials Stamping, Ford Motor Company.
    - Email: ailinich@ford.com
    - Phone number: 313-404-5395.