

DALIA ALI GHADDAR

(+1) 681-340-0956 • ghaddar2@illinois.edu

EDUCATION

PhD in Mechanical engineering <i>University of Illinois at Urbana Champaign</i> Department of Mechanical Science and Engineering current GPA of 4.0/ 4	January 2021 to Present
Master of engineering in Mechanical engineering <i>American University of Beirut</i> Faculty of Engineering and Architecture with excellent academic standing and a cumulative GPA of 4.0/ 4 Dean's Honor list	2018-2020
Bachelor of engineering in Mechanical engineering <i>American University of Beirut</i> Senior Mechanical Engineer, Faculty of Engineering and Architecture with distinction and a cumulative GPA of 3.81/4 Dean's Honor list	2014-2018
Lebanese Baccalaureate <i>Lycée National</i> General Sciences Lebanese Baccalaureate, Math and Physics Concentration	1999-2014

UNDERGRADUATE RESEARCH EXPERIENCE

Undergraduate Research Assistant <i>Department of Mechanical engineering, American University of Beirut</i> Improvement of a multi-segmented bioheat model that can accurately predict the skin temperature variation of nude and clothed human body segments in steady, transient and non-uniform environments. The skin temperatures were then used to predict the thermal comfort state of the human body under different environmental conditions.	September 2017
---	----------------

WORK EXPERIENCE

Khatib and Alami company, Lebanon <i>Eight weeks training</i> Internship at Khatib and Alami, a multidisciplinary consultancy firm	June 2017
---	-----------

MENTORING AND TEACHING EXPERIENCE

Graduate Teaching Assistant (TA), University of Illinois at Urbana Champaign <i>Department of Mechanical Science and Engineering</i> Courses taught: ME 330 - Engineering Materials	January 2021- to May 2021
Graduate Teaching Assistant (TA), University of Illinois at Urbana Champaign <i>Department of Mechanical Science and Engineering</i> Courses taught: ME 320 – Heat Transfer	August 2021- to Present
Undergraduate Mentor, American University of Beirut <i>Mechanical Engineering Undergraduate Curriculum</i> Mentored three undergraduate mechanical engineering students.	September 2014
SAT Course Instructor, Skillz Beirut <i>Skillz Beirut, Lycee Verdun, Zahrat al Ehsan</i> Gave more than 40 sessions in private schools	December 2018 to November 2021
Mechanical and Mathematics Course Instructor, Elite Tutors <i>Elite Tutors</i> Gave mechanical and mathematic courses to university students as well as scientific subjects to high school students	February 2018 to November 2021

Professional Tutor, Synkers*Synkers*

Completed more than 285 hours with an excellent rating and received a certificate from the British Council

December 2018 to
November 2021

GRADUATE RESEARCH EXPERIENCE**Graduate Research Assistant (RA)**

Department of Mechanical Science and Engineering, University of Illinois at Urbana Champaign

September 2017
August 2021

In the Energy Transport Research Lab (ETRL), experimental testing is performed on different types of heat exchangers to study their condensation, anti-icing and frosting performance.

Graduate Research Assistant (RA)

2018-2020

Department of Mechanical engineering, American University of Beirut

1. Thermal comfort modeling using segmental skin temperatures for naturally ventilated (NV) office spaces assisted with personalized ventilation (PV) units. An accurate correlation using the bioheat modeling of the human thermal response is developed to predict thermal comfort as function of occupant physiological and environmental parameters for a space that relies on the hybrid NV and PV cooling system. The developed thermal comfort correlation was then used to develop a dynamic PV-NV controller to maintain acceptable thermal comfort at all times of operation.
2. Shear layer vortex dynamics in the patent false lumen of an aortic dissection. An aortic dissection model was produced to examine the free shear layer developed under steady flow conditions as well as that under pulsatile flow conditions. The purpose of this work was to elucidate the dynamical flow processes associated with shear layer development in a patent false lumen aortic dissection.

PUBLICATIONS

1. Conference paper: Autonomously controlled PV unit in a naturally ventilated space to provide comfort by the use of thermal imaging. **2020**
2. Journal paper: Model-based multivariable regression model for thermal comfort in naturally ventilated spaces with personalized ventilation **2021**
3. Journal paper: Model-based adaptive controller for personalized ventilation and thermal comfort in naturally ventilated spaces **2021**
4. Journal paper: Shear Layer Vortex Dynamics in the Patent False Lumen of an Aortic Dissection. (To be submitted)

HONORS AND AWARDS**Dean's Honor list**

American University of Beirut

In recognition of outstanding academic achievement

Every semester
September 2013-
September 2020

ACADEMIC PROJECTS**Lego robots wrestling project**

Fall 2015

Introduction to mechanical engineering

Designing and programming a robot that can wrestle other robots in a mini-arena.

Wind, Solar and Temperature Tracking Experimental Test Bench

Spring 2016

Instrumentation and measurement

Used instrumentation and programming knowledge to build a test bench sensitive to each of these 3 properties and produces a certain response to prevent their increase using a fan, a window and curtains.

Wind turbine project

Fall 2017

Control systems

Control the speed of a wind turbine by first finding the optimum speed for maximum

energy harvest and designing a speed controller for that point.

Computer Vision

Fall 2018

"Vision-based real-time tracking and following system using a rotating camera". The implementation of a system that is able to perform autonomous tracking of a moving human is the main objective. To achieve this objective, a rotating camera that follows the movement of a tracked person was used. Three different algorithms were tested and compared: (1) Detection based tracking using ACF human detection, (2) Detection based tracking using Viola-Jones face detection, and (3) tracking with Discriminative Correlation Filter Tracker with Channel and Spatial Reliability (CSR-DCF). Experimental results demonstrate that all the three proposed algorithms are suitable for indoors scenes with a moving background, each having its pros and cons when compared to one other.

Solar energy project

Spring 2019

Active and passive solar techniques

"Active and passive solar techniques to improve the energy performance of a typical house in a rural area in Lebanon". This work analyzes the use of the f-chart method in designing an active liquid solar heating system by estimating the fraction of the total heating load supplied by the solar heating system. Moreover, on the winter sun side of the house namely the south façade, a simple passive Trombe wall is implemented for heating the house space in winter times. Overhangs are installed on the east and west façade windows to avoid unwanted solar heat gain entering the conditioned house especially during the cooling seasons.

Final year project

**Fall 2017-
Spring 2018**

Mechanical engineering

The project was about designing a Phase Change Material (PCM)-desiccant cooling vest for use in hot and humid environments. A cooling vest is a specially designed clothing that lowers the body temperature thus making exposure to warm climates more bearable. Our contribution to the cooling vest was implementing drying agents such as desiccants along with the PCMs to minimize sweat accumulation and absorb heat generated from the body. The new design was then tested on a manikin to check its effectiveness.

TECHNICAL SKILLS

Key I.T. Skills	MS Office, AutoCAD, C++, MatLab, FORTRAN, LabVIEW, CNC
Research skills:	Analyzing database, determining quantitative results, assisting with data collection and coding
Soft Skills	Presentation, Communication, Team work, Leadership, Management, Socializing, Confidence, Dedication, Responsibility, and Organization.
Languages	Fluent in Arabic: mother language English: spoken and written Basic French
Interests	Basketball, Swimming, Programming
Extra-Curriculum	American Society of Mechanical Engineering Member

REFERENCES

Available upon request.