DALIA GHADDAR

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EDUCATION

PhD in Mechanical engineering	**January 2021 to Present**
University of Illinois at Urbana Champaign	
Department of Mechanical Science and Engineering	
Current GPA of 4.0/ 4	
Expected graduation August 2024	
Master of engineering in Mechanical engineering	**2018-2020**
American University of Beirut	
Faculty of Engineering and Architecture with excellent academic standing and a cumulative GPA of 4.0/ 4	
Dean's Honor list	
Bachelor of engineering in Mechanical engineering	**2014-2018**
American University of Beirut	
Senior Mechanical Engineer, Faculty of Engineering and Architecture with distinction and a cumulative GPA of 3.81/4	
Dean's Honor list	
Lebanese Baccalaureate	**1999-2014**
Lycée National	
General Sciences Lebanese Baccalaureate, Math and Physics Concentration	

UNDERGRADUATE RESEARCH EXPERIENCE

Undergraduate Research Assistant	**September 2017**
Department of Mechanical engineering, American University of Beirut	
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.	

WORK EXPERIENCE

Khatib and Alami company, Lebanon	**June 2017**
Eight weeks training	
Internship at Khatib and Alami, a multidisciplinary consultancy firm	

MENTORING AND TEACHING EXPERIENCE

Graduate Teaching Assistant (TA), University of Illinois at Urbana Champaign	**January 2021- to December 2021**
Department of Mechanical Science and Engineering	
Courses taught: ME 330 - Engineering Materials	
ME 320 – Heat Transfer	
Graduate Teaching Assistant (TA), University of Illinois at Urbana Champaign	**August 2021- to Present**
Department of Mechanical Science and Engineering	
Courses taught: ME 320 – Heat Transfer	
Undergraduate Mentor, American University of Beirut	**September 2014**
Mechanical Engineering Undergraduate Curriculum	
Mentored three undergraduate mechanical engineering students.	
SAT Course Instructor, Skillz Beirut	**December 2018 to November 2021**
Skillz Beirut, Lycee Verdun, Zahrat al Ehsan	
Gave more than 40 sessions in private schools	

Mechanical and Mathematics Course Instructor, Elite Tutors	**February 2018 to**
Elite Tutors	**November 2021**
Gave mechanical and mathematic courses to university students as well as scientific subjects to high school students	
Professional Tutor, Synkers	**December 2018**
Synkers	**to November**
Completed more than 285 hours with an excellent rating and received a certificate from the British Council	**2021**

GRADUATE RESEARCH EXPERIENCE

Graduate Research Assistant (RA)	**May 2021 to**
Department of Mechanical Science and Engineering, University of Illinois at Urbana Champaign	**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. <u>Conference paper:</u> Autonomously controlled PV unit in a naturally ventilated space to provide comfort by the use of thermal imaging.	**2020**
2. <u>Journal paper:</u> Model-based multivariable regression model for thermal comfort in naturally ventilated spaces with personalized ventilation	**2021**
3. <u>Journal paper:</u> Model-based adaptive controller for personalized ventilation and thermal comfort in naturally ventilated spaces	**2021**
4. <u>Journal paper:</u> Shear Layer Vortex Dynamics in the Patent False Lumen of an Aortic Dissection. (To be submitted)	

HONORS AND AWARDS

Dean's Honor list	**Every semester**
American University of Beirut	**September 2013-**
In recognition of outstanding academic achievement	**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, Badminton, Swimming, Programming
Extra-Curriculum	American Society of Mechanical Engineering Member

REFERENCES

Available upon request.