Saba **Mansour**

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Education

University of Tehran — *Tehran, Iran*, *Sep. 2020- Expected Sep. 2022*
M.S. in Mechanical Engineering, Energy Conversion
- GPA: 18.69/20.00 (4.00/4.00)

University of Tehran — *Tehran, Iran*, *Sep. 2016- Sep. 2020*
B.S. in Mechanical Engineering
- GPA: 18.02/20.00 (3.79/4.00), Final 2-year GPA: 19.04/20.00 (4.00/4.00)

Research Interests

- Optimization of Energy Systems
- Computational Fluid Dynamics
- Heat Transfer Applications
- Renewable Energy Science and Technology
- Deep Learning and Neural Networks
- Electric Vehicle Battery Thermal Management
- Hybrid Electric Vehicle Energy Management Strategies
- HVAC and Refrigeration Systems
- Energy Storage

Research Experiences

Modelling and optimization of an environmentally benign battery thermal management system for an electric vehicle (EV) using deep learning; under supervision of Dr. Alireza Jalali and Prof. Mehdi Ashjaee (M.Sc. Thesis) — *Tehran, Iran*, *Jan. 2021- Present*

DESCRIPTION (so far):
- Researched extensively on thermal characteristics of cylindrical batteries used in EV battery packs
- Modelled numerous existing battery thermal management systems (BTMS) to find out about their distinctive superiority over other BTMSs using MATLAB and Python
- Analyzed and compared myriad of coolants to find the most beneficial one
- Introduced a new hybrid BTMS capable of adjusting the battery pack temperature in its ideal span as the atmospheric temperature changes between -40℃ to 60℃ (-40-140℉)
- Optimized the proposed BTMS characteristics to minimize the power consumption

Battery lifetime performance optimization through designing a novel energy management strategy (EMS) for plug-in hybrid electric vehicles using deep learning; under supervision of Dr. Pouria Ahmadi — *Tehran, Iran*, *Mar. 2021- Present*

DESCRIPTION:
- Recorded more than 700 Km real-life driving cycles on the roads of Tehran using GPS Tracker software
- Filtered recorded driving cycles using MATLAB
- Developed a detailed model of a PHEV drive train in the Amesim software
- Developed and trained a deep neural network (DNN) using Python programming language and TensorFlow library
- Designed a new energy management strategy using DNN and implement it on the previous model
- Compared the results of existing EMS and that of the new EMS in terms of vehicle's fuel consumption and pollution emission

Evaluating the impact of drive cycle aggressiveness and environmental factors on energy consumption and different charging strategies on battery degradation in Hybrid Electric Vehicles (HEVs) ; under supervision of Dr. P. Ahmadi (B.Sc. Thesis) — *Tehran, Iran*, *Sep. 2019- Sep. 2020*

DESCRIPTION:

- Recorded and filtered 20+ driving cycles on specified routes in Tehran using GPS Tracker and MATLAB
- Developed a detailed model of an HEV drive train and battery pack in the Amesim software
- Evaluated the impact of different driving attitudes, road slope, etc. on the vehicle energy consumption
- Evaluated the impact of five different charging strategies and environment temperature on battery degradation in HEVs

Selected Course Projects

(All done at the School of Mechanical Engineering, University of Tehran)

Solving the two-dimensional incompressible laminar Navier-Stokes equations for a lid-driven cavity flow using C++ and Tecplot software; under supervision of Dr. A. Jalali — *Tehran, Iran, Jan. 2021-Jun. 2021*

Implementing the elliptic equations' solving methods, namely Poisson and Laplace's equations using C++ and Tecplot software; under supervision of Dr. A. Jalali — *Tehran, Iran, Jan. 2021-Aug. 2021*

Designing a detailed model of a zero energy building's energy and HVAC systems capable of maintaining the room temperature and humidity within the standards of human comfort using TRNSYS software; under supervision of Dr. P. Ahmadi — *Tehran, Iran, Jan. 2021-Aug. 2021*

Developing a detailed model of a Gas Turbine (GT) cycle and analyzing it using MATLAB software; under supervision of Dr. P. Ahmadi — *Tehran, Iran, Jan. 2021-Aug. 2021*

Numerical investigation of Falkner-Skan equation for boundary layer flow on wedge using MATLAB software; under supervision of Dr. A. Jalali — *Tehran, Iran, Sep. 2020-Jan. 2021*

Flow simulation over an asymmetric Jakowski airfoil using ANSYS Fluent and MATLAB software; under supervision of Dr. A. Jalali — *Tehran, Iran, Sep. 2020-Jan. 2021*

Computation and comparison of Life Cycle Assessment (LCA) of different types of personal vehicles using GREET and GHGenius software; under supervision of Dr. P. Ahmadi — *Tehran, Iran, Jan. 2020-Aug. 2020*

Economic optimization of a building's heat pump system using MATLAB software; under supervision of Prof. Farshad Kowsari — *Tehran, Iran, Sep. 2019-Jan. 2020*

Stabilization of temperature profile of a cubic object exposed to an air jet using a number of heaters using ANSYS Fluent and MATLAB software; under supervision of Prof. F. Kowsari — *Tehran, Iran, Sep. 2019-Jan. 2020*

Horizontal Axis Wind Turbine (HAWT) rotor blade design concerning chord and twist optimizations using QBlade software; under supervision of Prof. K. Gharali — *Tehran, Iran, Jan. 2020-Aug. 2020*

Refrigeration system design for a cold storage room containing apples and poultry products; under supervision of Prof. B. Sajadi — *Tehran, Iran, Sep. 2019-Jan. 2020*

Selected Courses

Graduate Level

- Computational Fluid Dynamics I (20.00/20)
  Instructor: Dr. A. Jalali
- Advanced Energy Systems (19.15/20)
  Instructor: Dr. P. Ahmadi

Undergraduate Level

- Optimization of Mechanical Systems (19.02/20)
  Instructor: Prof. F. Kowsari
- Heat Transfer II (18.75/20)
  Instructor: Prof. H. Shokouhmand

Teaching Experiences

Teaching Assistant, Fluid Mechanics II, Presented by Dr. A. Jafari — *Tehran, Iran*
School of Mechanical Engineering, University of Tehran — *Sep. 2021- Present*
- Grading assigned homework, quizzes and projects

Teaching Assistant, Heat Transfer I, Presented by Prof. F. Kowsari — *Tehran, Iran*
School of Mechanical Engineering, University of Tehran — *Sep. 2020- Jan. 2021*
- Lectured additional course materials, Graded assigned homework, quizzes and projects

Teaching Assistant, Thermodynamics I, Presented by Prof. F. Kowsari — *Tehran, Iran*
School of Mechanical Engineering, University of Tehran — *Jan. 2020- Aug. 2020*
- Graded assigned homework, quizzes and projects

Teaching Assistant, Thermodynamics II, Presented by Dr. P. Ahmadi — *Tehran, Iran*
School of Mechanical Engineering, University of Tehran — *Sep. 2019- Jan. 2020*
- Graded assigned homework, quizzes and projects

Teaching Assistant, Principles of Electronics, Presented by Dr. H. Shashaani — *Tehran, Iran*
School of Mechanical Engineering, University of Tehran — *Sep. 2019- Jan. 2020*
- Lectured additional course materials, Graded assigned homework and exams

Teaching, Physics and Mathematics — *Tehran, Iran*
Manzoomeye Kherad Institute — *Aug. 2018- Jun. 2019*
- Taught high school students subjects including Mathematics, Physics, etc. and prepared them for the Iranian Nationwide University Entrance Exam (Konkur)

Working Experiences

Intern at Advanced Energy Systems Laboratory — *Tehran, Iran*
School of Mechanical Engineering, University of Tehran — *Jun. 2020- Sep. 2020*
- Collected data on conventional, electric, hybrid and fuel cell vehicles
- Compared alternative vehicles and fuels from an economic and environmental point of view

Intern at Sarma Afarin Company — *Tehran, Iran*
Sarma Afarin Company — *Jun. 2019- Sep. 2019*
- Collected and categorized data of available models of fan coil produced by the company
- Developed an algorithm to suggest the best size and type of fan coil based on costumer's need

Publications

Work in Progress (For submission to the Journal of Energy) — *Tehran, Iran* — *Jan. 2021- Present*
- **Title:** Battery lifetime performance optimization through designing a novel energy management strategy for plug-in hybrid electric vehicles using deep learning
  - **Supervisor:** Dr. P. Ahmadi

Technical Skills

Programming Languages	MATLAB, Python, C/C++
Computer-Aided Design	Solidworks, CATIA
CFD	ANSYS Workbench, COMSOL Multiphysics
Engineering Software	EES, Simcenter Amesim, TRNSYS, GREET, GHGenius, QBlade

Operating Systems	Windows, macOS
Others	Microsoft Office, Tecplot, Photoshop

Honors & Awards

Full Scholarship for M.Sc. Program — *Tehran, Iran*
School of Mechanical Engineering, University of Tehran — *Sep. 2020*

Ranked among the top 10% of the Entry — *Tehran, Iran*
School of Mechanical Engineering, University of Tehran — *Sep. 2020*

Full Scholarship for B.Sc. Program — *Tehran, Iran*
School of Mechanical Engineering, University of Tehran — *Sep. 2016*

Ranked among the top 1% of 160,000+ participants — *Tehran, Iran*
Iranian National University Entrance Exam (Konkur)- Mathematics and Physics — *Jul. 2016*

Certificate of Distinction in Australian Mathematics Competition — *Tehran, Iran*
Placed in the top 8% of several hundreds of thousands of participants — *Sep. 2015*

Languages

English (Professional Working Proficiency)

- Holding an Overall Band Score of 7.5 in the IELTS Academic Test

Persian/Farsi (Native)

French (Basic knowledge in speaking)

References

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