Mahdi Azar Barenji

PhD Student in Mechanical Engineering (2024—)
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Education

University of Tehran, TEH, Iran 2020— 2023
M.S. in Mechanical Engineering — GPA: 4.0/4.0 Rank: 2/30
Thesis: *Design of a Novel Cooling System for Battery Pack of EV Under Extremely Fast Charge Condition*
Advisers: Dr.Pouria Ahmadi, Dr.Ehsan Houshfar

University of Tabriz, EA, Iran 2016 — 2020
B.S. in Mechanical Engineering — GPA: 4.0/4.0 — Summa Cum Laude
Thesis: A Comprehensive Study on Several Kalina Cycle Systems
Adviser: Prof.S. Mohammad S. Mahmoudi
Societies: Mechanical Engineering Olympiad

National Organization for Development of Exceptional Talents (NODET), EA, Iran 2009 — 2016
Middle and High School Diploma in Mathematics and Physics
Societies: Chemistry Olympiad — NODET

Research Interests

Batteries and Energy storage — Computational Fluid Dynamics and High Performance Computing — Thermal Management — Microfluidics — Micro/Nano Heat Transfer — Mashine Learning in Fluid Mechanics

Research

Journal Articles

1. **M.A.Barenji**, A. Zabihi, P.Ahmadi, E.Houshfar, "Thermal analysis of novel cooling system of Electric Vehicle under fast charge condition in real driving cycle," *almost ready to submit*, 2024.
2. A.Zabihi, **M.A.Barenji**, Sajad Maleki, P.Ahmadi, "Modeling and comparing the real performance of an electric vehicle using lithium ion battery and solid state battery in Tehran using Amesim," *Draft*, 2024.

Conference Proceedings

1. **M.A.Barenji**, K.Sadeghy, "Numerical study of a bubble's behavior under external pressures with differnet frequencies," *Annual International Conference of the Iranian Association of Mechanical Engineers*, 2021.
2. **M.A.Barenji**, S. Mansour, P.Ahmadi, "Modeling and simulation of LiBr-H2O absorption chiller integrated with PEMFC," *Iranian Smart Enegy Systems Workshop organized by University of Tehran*, 2022.

Industrial Projects

1. **M.A.Barenji**, M.Hajati, M.R.Dehkordi, "Design and numerical modeling of internal cooling passages with rib turbulators," *For TurboTec Company*, 2022.
2. **M.A.Barenji**, S. Mansour, P.Ahmadi, "Design of net zero building for Tabriz climate using TRANSYS," *Advanced Energy Systems Lab*, 2021.

Side Projects

1. "Dielectrophoreric seperation of platelets from red bloo cells using zigzag micochannel," *Micro/Nano Fluid Mechanics Course*, 2022.
2. "Simulation of heat transfer in led driven cavity using Boussinesq approximation," *Advanced CFD course*, 2021.

Honors & Awards

Selected

- Best Presentation Award for "Literature Review of using Machine Learning for Thermodynamic Cycles," 2020, Graduate Seminars in University of Tehran.

Others

- 1st rank in Last-2-year GPA (19.71/20) among 124 students. BSc, 2016—2020
- Merit-based Admission for MSc in Mechanical Engineering from Sharif University of Technology, University of Tehran, and University of Tabriz. BSc, 2020
- Ranked among Top 0.1 percent students among approximately 200,000 participants in the National University Entrance Exam (Konkour) in the field of Mathematics and Physics for B.Sc. degree.

Teaching and Research Experiences

- Advance Energy Systems Lab — *Role: RA* MSc, 2021 — 2023
- Advanced Energy Systems Optimization course — *Role:TA* MSc, 2022 — 2023
- Fluid Mechanics II — *Role: TA* MSc, 2021
- Thermodynamics II — *Role: Course support* BSc, 2020
- C Programming — *Role: Head TA* BSc, 2018 — 2019

Skills

- **Technical Software**: COMSOL, ANSYS Fluent, OpenFOAM, TRANSYS, Tecplot, Autocad, SOLIDWORKS, CATIA
- **Programming**: Matlab, C/C++, Python, EES

Selected Courses(A+)

- **Master**:
  Computational Fluid Dynamics(CFD), Micro-Nano Fluid Mechanics, Two Phase Flow, Advanced Convection, Advenced Energy Systems (Optimization), Advanced Fluid Mechanics, Advanced Thermodynamics, Advanced Mathematics
- **Bachelor**:
  Introduction to CFD, Numerical Computation, PawerPlants, Refrigeration Systems Design, Engineering Mathematics, Control, Thermodynamics(I,II), Fluid Mechanics(I,II), Heat Transfer I
- **Elective**:
  Introduction to Data Science (Coursera), Applied Machine learning in Python (Coursera), Non-Newtonian Fluids (U.of Tehran)

Certifications

- **Smart Energy Systems Workshop**. U of Tehran
- **Introduction to Data Science in Python**. Coursera
- **Progress in Hydrogen and Fuel Cells Certificate**. Coursera
- **Python Data Structures**. Coursera