Amirreza Mahmoudi, EIT

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Profile

Mechanical Engineer (EIT) and PhD Candidate in Mechanical Engineering at the University of Saskatchewan, focused on HVAC and energy-exchanger research for cold climates. Four years of experience in technical sales/engineering of HVAC systems, hydronic balancing, control valves, and energy-efficient heating/cooling solutions for buildings. This experience is now complemented by hands-on lab experimentation, CFD, 2/3D CAD modeling, and data analysis, all of which are informed by industry experience. Recognized with the Dean's Scholarship, three USask awards, and the ASHRAE Grant-in-Aid Award.

Core Skills

- *HVAC design:* System selection and sizing (heating/cooling plant equipment, AHUs, HRV/ERV, VRF, split units, rooftop units, balancing and control valves, actuators, and instrumentation); standards and installation oversight; site reviews.
- *Mechanical drawings literacy:* plans, risers, sections, details, P&IDs, equipment/valve schedules, shop drawings/as-builts.
- *Codes/Standards:* ASHRAE 62.1/90.1/84 & handbooks, commissioning basics.
- *Software:* eQuest, Carrier HAP, EnergyPlus, AutoCAD, Autodesk Fusion, SolidWorks, ANSYS Fluent, COMSOL, MATLAB, RETScreen, PVSyst.
- *Communication & Leadership:* Client technical presentations, proposals, and training; teaching assistance; student leadership (ASHRAE president), ASHRAE technical committees.

Experience

Technical Sales Engineer — Control Valves & Hydronic Balancing | Farab Co., Iran
Jun 2020 – Jul 2022

- Delivered technical solutions for control/balancing valves and industrial valves across building and industrial applications.
- Created tailored product demos and RFx responses; collaborated with R&D to close product gaps; supported proofs of concept; expanded CRM prospects and revenue.

Technical Sales Engineer (CAC/HVAC Systems) | Ravosh Energy Engineering Co., Iran
Jan 2019 – Apr 2020

- Comfort air-conditioning sales; performed load calculations (Carrier HAP); advised clients on HVAC system selection.

Technical Sales Engineer (HVAC & Hydronics) | Yekta Tadbir Modern, Iran
Jan 2018 – Jan 2019

- Consulted on HVAC equipment and hydronic balancing solutions; sized control valves; authored technical articles; conducted technical presentations and product demonstrations.

Part-time R&D Officer (Renewables) | Iran National Water & Wastewater Co.
Dec 2019 – Jan 2021

- Performed techno-economic studies for on-grid PV power plants (100 kW–10 MW) at pumping/reservoir facilities; prepared feasibility reports and plant layouts.

Leadership & Service

President, ASHRAE Student Branch (USask) • Nov 2023 – Present
Organize workshops, site tours, and invited speaker sessions; grow membership and engagement; coordinate student involvement in competitions.

ASHRAE Technical Committees TC1.2 (Instruments & Measurements), TC5.5 (Air-to-Air Energy Recovery), and TC8.11 (Unitary A/C & HPs) • 2024 – Present
Participate in handbook revision activities and committee meetings.

Tutor & Peer Mentor, USask • 2023 – 2024
Support undergraduates in core thermofluids; mentor new graduate students through orientation workshops.

Education

PhD, Mechanical Engineering — University of Saskatchewan, Canada • 2022 – Present (Expected 2026)
Research focus: frost formation in Liquid-to-Air Membrane Energy Exchangers (LAMEEs); coursework GPA = 90; TA for Fluid Mechanics, Heat Transfer, more.

MSc, Renewable Energies Engineering — University of Tehran, Iran • 2015 – 2018
GPA 19/20 (1st in class). Thesis: Performance enhancement of a solar still via electrohydrodynamics (EHD); associated CFD modeling; patent granted.

BSc, Mechanical Engineering — Ferdowsi University of Mashhad, Iran • 2010 – 2015
Thesis: Emission analysis of a turbocharged gasoline engine.

Selected Publications

1. Mahmoudi, A., Fauchoux, M.T., Simonson, C.J., “Bronze Wool as a Porous Mixer for Air Temperature Uniformity in Energy Exchangers,” Transactions of the Canadian Society for Mechanical Engineers, 2025 (accepted for publication).
2. Mahmoudi, A., Fauchoux, M.T., Simonson, C.J., “Effect of Surface Hydrophobicity of the Liquid Side of a Membrane on the Frost Limits of a Liquid-to-Air Membrane Energy Exchanger

(LAMEE) under Subzero Air Temperatures," ASHRAE Transactions, 2026 (accepted for publication).

3. Mahmoudi, A., Fauchoux, M.T., Simonson, C.J., "Investigation of the frost limits of a liquid-to-air membrane energy exchanger (LAMEE) under subzero air temperatures," International Journal of Heat and Mass Transfer, 2026.
4. Fauchoux, M.T., Mahmoudi, A., et al., "Frosting on Porous Membranes in Energy Exchangers," Philosophical Transactions of the Royal Society A, 2025.
5. Mahmoudi, A., "New research may point the way towards frost-free heat pumps," The Conversation, 2023.

Full list: ORCID and Google Scholar.

Awards

- Dean's Scholarship (4-year stipend & full tuition; x10 awards/yr), University of Saskatchewan.
- ASHRAE Grant-in-Aid Award (US$ 11,500; x10-20 awards/year globally).
- Russell Haid Memorial Award (×2), USask College of Engineering.
- George Ira Hanson Postgraduate Award in Energy Research, USask College of Engineering.

Licensure & Certifications

- *Mechanical Engineering License (Building) - Iran (IRCEO):* Granted authority to review/sign mechanical building designs and site inspection reports under the National Building Codes of Iran after passing the licensure exam and vetting. Credential earned; not practiced.
- *Engineer-in-Training (EIT) – Canada (APEGS):* Registered; eligible to practice engineering under the supervision of a P.Eng.; member in good standing.

Other certifications: Valve Control Pneumatic Actuator; Design & Operation of Solar PV (PVSyst); WHMIS & Lab Safety; LinkedIn Learning (Sales soft skills).

Keywords

Heat/energy exchangers • Liquid cooling • Dew-point control • Leak detection • HVAC design • Building energy modeling (eQuest/EnergyPlus/HAP) • Control valves (PICV/DPCV/DRV) • CFD (Fluent/COMSOL) • MATLAB • AutoCAD • SolidWorks • Experimental methods • ASHRAE