

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.
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Experience

Technical Sales Engineer (Regional Office Manager) — 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.
- Treated each client request as a new engineering problem, requiring design, techno-economic analysis based on the info provided by the client in document packages and in-person meetings; Created tailored product demos and RfX responses; collaborated with R&D to close product gaps; supported proofs of concept; expanded CRM prospects and revenue.
- x10 increase in the number of active accounts and x3 increase in sales in the first year.

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.
- Employee of the month. Record breaking sales for two seasons.

Technical Sales Engineer (HVAC & Hydronics) | Yekta Tadbir Modern, Iran

Jan 2018 – Jan 2019

- Consulted on HVAC equipment selection and hydronic balancing, including control-valve sizing; wrote engineering articles for the corporate website; delivered technical presentations and product demos.

Part-time R&D Officer (Renewables) | Iran National Water & Wastewater Co.

Dec 2019 – Jan 2021

- Built techno-economic models for eighteen 100 kW and two 10 MW on-grid PV power plants at pumping/reservoir facilities to offset the loads inflicted on the grid by the facilities; prepared plant layouts and reports (CAPEX/OPEX, LCOE, NPV/IRR, payback, sensitivity to tariff and FX rates) to support go/no-go decisions and compare design scenarios.
 - The employer saved \$300,000 in consultation costs and ~\$0.5 million/yr in electricity costs with the proposed plan.
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Leadership & Service

President, ASHRAE Student Branch (USask) • Nov 2023 – Aug 2025

Organized workshops, site tours, and invited speaker sessions; grew membership (x10 times) and engagement; coordinated student involvement in competitions. Brought the West Canada and NW U.S. Best Student Branch Award to USask for the first time.

ASHRAE Technical Committees TC1.2 (Instruments & Measurements), TC5.5 (Air-to-Air Energy Recovery), and TC8.11 (Unitary A/C & Heat Pumps) • 2024 – Present

Participation in handbook revision activities and committee meetings.

Tutor & Peer Mentor, USask • 2023 – 2024

Supported undergraduates in core thermofluids courses; mentored new graduate students through orientation workshops at USask Library on topics including research planning, presentations, etc.

English-Farsi Interpreter, Saskatoon Open Door Society • 2022 – 2024

Helped Farsi-speaking newcomers to communicate on occasions such as medical appointments, etc.

Education

PhD, Mechanical Engineering — University of Saskatchewan, Canada • 2022 – Present (Expected September 2026)

Research focus: Frost formation in Liquid-to-Air Membrane Energy Exchangers; coursework GPA = 90; TA positions including Fluid Mechanics/Heat Transfer; Multiple excellence awards winner;

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.

Publications

1. Mahmoudi, A., Fauchoux, M.T., Simonson, C., "[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.
2. Mahmoudi, A., Fauchoux, M.T., Simonson, C., "[Bronze wool as a porous mixer for air temperature uniformity in energy exchangers](#)," Transactions of the Canadian Society for Mechanical Engineers, 2025.
3. Mahmoudi, A., Fauchoux, M.T., Simonson, C., "[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.
6. Mahmoudi, A., Soltani Asl, M., Taghizadeh Darban, B., "[Solar power applications in water and wastewater treatment systems: a review with focus on the current status of Iran's NWW Co.](#)," Journal of Water and Sustainable Development, 2021.
7. Mahmoudi, A., Pourfayaz, F., Kasaeian, A., "[A simplified model for estimating heat transfer coefficient in a chamber with electrohydrodynamic effect \(corona wind\)](#)," Journal of Electrostatics, 2018.
8. Jahangir, M.H., Mahmoudi, A., "[Ocean wave energy conversion technologies: a review](#)," Iranian Journal of Marine Science and Technology, 2018.
9. Sokhansefat, T., Mohammadi, D., Kasaeian, A., Mahmoudi, A., "[Simulation and parametric study of a 5-ton solar absorption cooling system in Tehran](#)," Energy Conversion and Management, 2017.
10. Kasaeian, A., Mahmoudi, A., Razi Astaraei, F., Hejab, A., "[3D simulation of solar chimney power plant considering turbine blades](#)," Energy Conversion and Management, 2017.
11. Mahmoudi, A., Ghazikhani, M., Khazaei, I., "[Simulating the effects of turbocharging on the emission levels of a gasoline engine](#)," Alexandria Engineering Journal, 2017.

Conferences

1. Mahmoudi, A., Fauchoux, M., Simonson, C., "Fouling due to Frost in Cross-Flow Air-to-Air Heat Exchangers: Part I – Constant Mass Flow Rate," [Heat Exchanger Fouling and Cleaning Conference](#), Vravrona, Greece, 2026.
2. Mahmoudi, A., Fauchoux, M., Simonson, C., "Fouling due to Frost in Cross-Flow Air-to-Air Heat Exchangers: Part II – Constant Pressure Drop and Temporal Variations," [Heat Exchanger Fouling and Cleaning Conference](#), Vravrona, Greece, 2026.
3. Gollamudi, S., Mahmoudi, A., Fauchoux, M.T., Simonson, C., "[Effect of Liquid Desiccant on the Frosting Limit of a Liquid-to-Air Membrane Energy Exchanger](#)," ASHRAE Winter Conference, Las Vegas, 2026.

4. Mahmoudi, A., Fauchoux, M.T., Simonson, C., "[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 Winter Conference](#), Las Vegas, 2026.
5. Mahmoudi, A., Joseph, A., Fauchoux, M., Simonson, C., "Enhancing the Uniformity of Air Temperature Profile in Duct Systems: An Experimental Study Using Bronze Wool as a Porous Mixing Medium," [CSME Conference](#), Toronto, 2024.
6. Mahmoudi, A., Ahmadi, S.S., Rezaei, R., Yousefi, H., "[Global warming, radiative forcing, and climate sensitivity: a review of the mechanisms](#)," [1st International Conference on Climate Change](#), Tehran, 2017.
7. Mahmoudi, A., "[NO_x, CO, CO₂, and UHC emission levels of gasoline engine of Nissan maxima: the effects of turbocharging](#)," [6th Fuel and Combustion Conference of Iran](#), Mashhad, 2016.
8. Esfahani, J.A., Moghadam, B.J., Nouri, M., Mahmoudi, A., "[Numerical and parametric study of a centrifugal pump: effect of blade number and volute shape](#)," [International Conference on Advances in Mechanical and Robotics Engineering](#), Kuala Lumpur, 2014.

Book chapters

1. Mahmoudi, A., Ghasempour, R., Aslani, F., "The Application of Nanotechnology to Improve the Performance of Sustainable Buildings for Lighting and Heating" (book chapter), in *Green Building: Applied Nanotechnology and Renewable Energy* (2nd ed.), CRC Press, 2018. ISBN: 9781439845332.

Papers in the works

1. "Effect of Surface Hydrophobicity of the Air Side of Membranes on the Frost Limits of Liquid-to-Air Membrane Energy Exchangers (LAMEEs)"
 2. "Effect of membrane vapor diffusion resistance, air temperature, and air relative humidity on frost prevention potential of liquid-to-air membrane energy exchangers (LAMEEs)"
 3. "Impact of Frost Thickness, Distribution, and Thermal Conductivity on the Effectiveness of Air-to-Air Heat Exchangers in Cold Climates"
 4. "Frost growth and the location of frost initiation in a Liquid-to-Air Membrane Energy Exchanger (LAMEE)"
 5. "A comprehensive methodology for reliable and repeatable frost limit testing in liquid-to-air membrane energy exchangers (LAMEEs) under subzero air temperatures"
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Awards

- [Dean's Scholarship](#) (C\$ 120,000; 4-year stipend & full tuition; x10 awards/yr).
- [ASHRAE Grant-in-Aid Award](#) (US\$ 11,500; x10-20 awards/year globally).
- [APEGS Member Education Grant](#) (C\$ 7,500; x6 awards/yr)
- Russell Haid Memorial Award (x2), 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 • HVAC design • Building energy modeling (eQuest/EnergyPlus/HAP) • Control valves (PICV/DPCV/DRV) • CFD (Fluent/COMSOL) • MATLAB • AutoCAD • SolidWorks • Experimental methods • ASHRAE