KHOSROW EBRAHIMI, PH.D.

Assistant Professor of Practice
Ingram School of Engineering
Texas State University

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Google Scholar: https://scholar.google.com/citations?user=azM-rpgAAAAJ&hl=en
ResearchGate: https://www.researchgate.net/profile/Khosrow-Ebrahimi

PROFESSIONAL PROFILE

Mechanical engineering educator, researcher, and practicing engineer with over fifteen years of experience in **computational fluid dynamics (CFD), fluid mechanics, gas dynamics, heat transfer, thermodynamics, and thermal-fluid sciences**. Extensive experience teaching undergraduate and graduate mechanical engineering courses across multiple institutions in the United States, developing innovative curricula, implementing experiential and project-based learning, supervising graduate research and senior capstone design projects, and contributing to ABET assessment and program development.

My research integrates **high-fidelity computational modeling, multiphysics simulation, and experimental analysis** to address engineering challenges in **aerospace systems, advanced thermal management, electronics and data center cooling, sustainable energy systems, HVAC, and fluid-thermal system optimization**. My scholarly work has attracted more than **1,400 citations** and includes publications in leading journals in thermal sciences and fluid engineering.

Committed to excellence in teaching, curriculum innovation, student mentorship, and interdisciplinary collaboration, I seek to develop impactful research programs that actively engage undergraduate and graduate students while strengthening partnerships with industry and the broader engineering community.

RESEARCH SUMMARY

Research Areas

- Computational Fluid Dynamics (CFD), Thermal-Fluid Sciences, Heat Transfer, Thermodynamics, Gas Dynamics, and Multiphysics Modeling
- Applications in aerospace engineering, electronics cooling, data center thermal management, sustainable energy systems, HVAC, and advanced thermal management

Research Impact

- 4 peer-reviewed journal publications
- 10 refereed conference papers
- Over 1,400 Google Scholar citations
- h-index: 7 (Google Scholar)
- Principal Investigator on two U.S. Department of Defense (DoD) research proposals
- Reviewer for NSF SBIR/STTR proposals and multiple leading engineering

AREAS OF EXPERTISE

- Computational Fluid Dynamics (CFD)
- Gas Dynamics
- Aerodynamics and Aerospace Thermal Systems
- Multiphysics Modeling
- Compressible Flow
- Aircraft Environmental Control Systems
- Turbulent Flow Simulation
- Fluid Mechanics
- Thermal -Fluid Sciences
- Heat Transfer
- Thermodynamics
- Electronics Cooling
- Thermal Management
- HVAC Systems
- Sustainable Energy Systems
- Machine Learning and AI for Engineering
- Engineering Education and Curriculum Development
- Laboratory Development
- Project-Based Learning
- Experiential Learning Pedagogy
- Graduate Thesis and Senior Design Supervision

EDUCATION

Ph.D., Mechanical Engineering
KANSAS STATE UNIVERSITY, MANHATTAN, KS MAY 2012
Dissertation: Numerical simulation of turbulent airflow, tracer gas diffusion, and particle dispersion in a mockup aircraft cabin

M.S., Mechanical Engineering
K.N. TOOSI UNIVERSITY OF TECHNOLOGY, TEHRAN, IRAN AUGUST 2003
Thesis: Analytical study of forced convective heat transfer to turbulent pipe flow of supercritical water

B.S., Mechanical Engineering
UNIVERSITY OF TEHRAN, TEHRAN, IRAN SEPTEMBER 2000
Capstone Project: Design and manufacture of thermoplastic and Bakelite molds

ACADEMIC APPOINTMENTS

Assistant Professor of Practice
TEXAS STATE UNIVERSITY | SAN MARCOS, TX 2022 – PRESENT
Responsibilities include

- Teaching undergraduate and graduate mechanical engineering courses.
- Developing thermal-fluid laboratory experiments.
- Supervising graduate students and senior capstone projects.
- Participating in ABET assessment and curriculum development.
- Collaborating with industry-sponsored research projects.
- Advising multidisciplinary student design teams.

Fixed-Term Assistant Professor
MINNESOTA STATE UNIVERSITY | MANKATO, MN 2018 – 2022
Responsibilities include

- Teaching undergraduate and graduate mechanical engineering courses.
- Supervising senior design projects.
- Advising graduate students.
- Developing new laboratory exercises.
- Participating in curriculum improvement**.**

Previous Academic Appointments

- BOISE STATE UNIVERSITY (FULL-TIME LECTURER) 2017- 2018
- ROWAN UNIVERSITY (3/4-TIME-VISITING INSTRUCTOR) 2016-2017
- VILLANOVA UNIVERSITY (ADJUNCT) SPRING 2017
- BETHANY LUTHERAN COLLEGE (ADJUNCT) FALL 2019

RESEARCH INTERESTS

- Computational Multiphysics Modeling and Thermal-Fluid Systems Optimization
- Aerodynamics, Gas Dynamics, and Compressible Flows
- Computational and Experimental Fluid Mechanics, Heat Transfer, and Thermodynamics
- Supersonic and Hypersonic Fluid-Structure Interactions
- Advanced Thermal Management of Electronics, Data Centers, and High-Performance Computing Systems
- Indoor Air Quality, Airborne Particle Transport, and Aerosol Dispersion Modeling
- Artificial Intelligence and Physics-Informed Modeling for Multidisciplinary Engineering Systems
- HVAC System Design and Optimization for Healthcare Facilities, Clean Rooms, and High-Performance Buildings
- Renewable Energy Systems, Thermal Energy Storage, and Waste Heat Recovery

TEACHING INTERESTS

Undergraduate

- Numerical Methods
- Fluid Mechanics
- Heat Transfer
- Thermodynamics
- Thermal-Fluid Systems Design
- Aircraft Environmental Control Systems (ECS)
- HVAC&R
- Thermal-Fluids Laboratory

Graduate

- Computational Fluid Dynamics
- Advanced Heat Transfer
- Advanced Fluid Mechanics
- Advanced Thermodynamics
- Electronics Thermal Management
- Multiphase Flow
- Sustainable Thermal Systems
- Engineering Mathematics

PUBLICATIONS

SELECTED JOURNAL PUBLICATIONS

[1] Ebrahimi, K., Jones, G.F., Fleischer, A.S., 2017, " The viability of ultra-low temperature waste heat recovery using organic Rankine cycle in dual loop data center applications", Applied Thermal Engineering, Vol. 126, pp. 393-406.

[2] Ebrahimi, K., Jones, G.F., Fleischer, A.S., 2015, " Thermo-economic analysis of steady-state waste heat recovery in data centers using absorption refrigeration", Applied Energy, Vol. 139, pp. 384-397.

[3] Ebrahimi, K., Jones, G.F., Fleischer, A.S.,2014, " A review of data center cooling technology, operating conditions, and the corresponding low-grade waste heat recovery opportunities", Journal of Renewable and Sustainable Energy Reviews, Vol. 31, pp. 622-638.

[4] Ebrahimi, K., Zheng Z., and Hosni, M.H., 2013," A computational study of turbulent airflow and tracer gas diffusion in a generic aircraft cabin model", ASME Journal of Fluids Engineering, Vol.135, pp. 111105:1-15.

REFEREED CONFERENCE PAPERS

[1] Yamin, M., **Ebrahimi, K.**, & Schull, K. (2022). Multiple interactive hands-on applications in Statics (best in 5 min demonstration session). Paper presented at the ASEE 2022 Annual Conference, June 25th-29th, 2022, Minneapolis, MN. Paper ID#37597.

[2] Ebrahimi, K., Ebrahimi, S., & **Ebrahimi, K.** (2020). Fractal Pattern Effects on Natural Convection Heat Transfer and Flow Characteristics. In 19th IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm) (pp. 357-365). Orlando, FL, USA. doi: 10.1109/ITherm45881.2020.9190161.

[3] Ebrahimi, K., Ortega, A., Li, C., Yazawa, K., & James, S. (2018). Waste Heat Recovery From Distributed Rack-based Fuel Cells Using Thermoelectric Generators. In 17th IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm) (pp. 795-814). San Diego, CA, USA. doi: 10.1109/ITHERM.2018.8419483.

[4] Ebrahimi, K., Jones, G., & Fleischer, A. (2014). A review of challenging issues in the integration of absorption refrigeration and organic Rankine Cycle into a data center cooling system. In Fourteenth Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm) (pp. 1047-1054). Orlando, FL, USA. doi: 10.1109/ITHERM.2014.6892397.

[5] Ebrahimi, K., Hosni, M. H., & Zheng, Z. C. (2013). Computational Study of Turbulent Airflow in a Full-Scale Aircraft Cabin Mockup: Part 1 — Determination of Boundary Conditions at the Outlet of Air Diffusers. In ASME 2013 Fluids Engineering Division Summer Meeting (Paper No: FEDSM2013-16564, V01AT03A023; pp. 9). July 7–11, 2013, Incline Village, Nevada, USA.

[6] Ebrahimi, K., Zheng, Z. C., & Hosni, M. H. (2012). Computational Study of the Effects of Particle Size, Particle Injection Configuration, and Operating Pressure Gradient on Turbulent Dispersion of Spherical Micron-Sized Particles in a Generic Mockup Aircraft Cabin. In ASME 2012 International Mechanical Engineering Congress and Exposition (Paper No: IMECE2012-88504, pp. 221-236). doi: 10.1115/IMECE2012-88504. November 9–15, 2012, Houston, Texas, USA.

[7] Ebrahimi, K., Zheng, Z. C., & Hosni, M. H. (2011). Simulation of the Turbulent Dispersion of 10 Micron Particles in a Generic Half-Cabin Model. In ASME 2011 International Mechanical Engineering Congress and Exposition (Paper No: IMECE2011-64183, pp. 907-917). doi: 10.1115/IMECE2011-64183. November 11–17, 2011, Denver, Colorado, USA.

[8] Ebrahimi, K., Zheng, Z. C., & Hosni, M. H. (2010). LES and RANS Simulation of Turbulent Airflow and Tracer Gas Injection in a Generic Aircraft Cabin Model. In ASME 2010 3rd Joint US-European Fluids Engineering Summer Meeting collocated with 8th

International Conference on Nanochannels, Microchannels, and Minichannels (Paper No: FEDSM-ICNMM2010-30552, pp. 227-240). doi: 10.1115/FEDSM-ICNMM2010-30552. August 1–5, 2010, Montreal, Quebec, Canada.

[9] Ebrahimi, K., & Bazargan, M. (2004). Numerical investigation of the radial variation of heat flux and shear stress on heat transfer to turbulent flow of supercritical water. Proceedings of ISME2004, 8th International Conference of Mechanical Engineering, Tehran, Iran.

[10] Ebrahimi, K., & Bazargan, M. (2003). Analytical study of forced convection heat transfer to turbulent flow of supercritical water. Proceedings of the 8th National Conference on Fluid Dynamics, Tabriz, Iran.

CITATION METRICS

As of July 1st, 2026

- H-index: 7 (Google Scholar), 6 (ResearchGate), 6 (Scopus)
- Total Citations: 1416 (Google Scholar), 1070 (ResearchGate), 999(Scopus)
- Average Citations per Publication:
- Journal Papers: 326 (Google Scholar), 248 (ResearchGate), 233(Scopus)
- Conference Papers: 6 (Google Scholar), 4 (ResearchGate), 2 (Scopus)
- Most Cited Publication: "A review of data center cooling technology, operating conditions, and the corresponding low-grade waste heat recovery opportunities", 1021 (Google Scholar), 776(ResearchGate), 701(Scopus)

SUBMITTED RESEARCH PROPOSALS

U.S. DEPARTMENT OF DEFENSE (DOD)

- Integrated Multidisciplinary Design, Analysis, and Optimization Framework for Hypersonic Boost-Glide Weapons
Solicitation: DON26BZ01-NV035
Role: Principal Investigator
Submitted: June 5, 2026
Status: Pending

- Hybrid RANS/LES Interface-Resolved Heat Flux Model (HRL-HFX) for Hypersonic Flows
Proposal No.: N25B-T033-0062 (Topic N25B-T033)
Role: Principal Investigator
Submitted: May 19, 2025
Status: Not Funded

COURSES TAUGHT

THERMAL-FLUID SCIENCES

Thermodynamics
ME 329: Applied Thermodynamics — Minnesota State University, Spring 2020 and Summer 2022
ENSC 381: Engineering Thermodynamics — Bethany Lutheran College, Fall 2019
Fluid Mechanics
ME 3335: Engineering Fluid Mechanics — Texas State University, Fall 2024- Present
ME 321: Fluid Mechanics — Minnesota State University, Fall 2018 and Spring 2021
Heat Transfer
ME 324: Heat Transfer — Minnesota State University, Spring 2019 and Summer 2022
ME 320: Heat Transfer — Boise State University, Summer 2018
Thermal-Fluid Laboratory
ME 4131: Fluids Thermal Laboratory — Texas State University, Fall 2025- Present
ME 436W: Thermal/Fluids Laboratory — Minnesota State University, Fall 2018- 2021
ME 10322: Thermal/Fluid Sciences II (practicum course) — Rowan University, Spring 2017
ME 3900: Thermo-Fluid Laboratory — Villanova University, Fall 2013 and Spring 2014
Thermal-Fluid Elective/Stack Courses
ME 603: Computational Fluid Mechanics and Heat Transfer — Minnesota State University, Fall 2020

ME 439: HVAC Design — Minnesota State University, Fall 2019
ME 416: Thermal/Fluids Systems Design — Minnesota State University, Spring 2019
ME 7038: Computational Fluid Mechanics and Heat Transfer — Villanova University, Spring 2017

Thermal-Fluid Courses for Non-ME Curriculums

ME 299: Thermal Analysis for EE & CivE Students — Minnesota State University, Spring & Summer 2019 and Fall 2021

Engineering Mechanics

Statics

ENGR 2301: Statics — Texas State University, Summer 2023
ME 212: Statics — Minnesota State University, Summer 2019 and Fall 2020/2021

Dynamics

ME 214: Dynamics — Minnesota State University, Spring 2020 and Spring 2021
ENGR 220: Dynamics — Boise State University, Fall 2017 and Spring 2018

Engineering Mechanics Courses for Non-ME Curriculums

ME 213: Statics & Dynamics for EE Students — Minnesota State University, Fall 2021

Mechanics of Machines

Machine Dynamics

ME 380: Kinematics & Machine Dynamics — Boise State University, Spring 2018

Machine Design

ME 10301: Machine Design — Rowan University, Fall 2016

Dynamics and Control of Mechanical Systems

System Dynamics & Control

ME 10344: System Dynamics and Control II — Rowan University, Spring 2017
ME 10343: System Dynamics and Control I — Rowan University, Fall 2016

Freshman Courses

Engineering Graphics/ Technical Drawing

ENGR 1304: Engineering Graphics — Texas State University, Fall 2022/2023, Summer 2023, Spring 2023

Introduction to Mechanical Engineering

ME 1201: Introduction to Digital Mechanical Engineering — Texas State University, Fall 2022/2023/2024 Spring 2023/2024/2025
ME 1101: Introduction to Digital Mechanical Engineering Laboratory — Texas State University, Spring 2023/2024

Engineering Science & Math

Engineering Mathematics, Statistics & Probability

ME 291: Engineering Analysis — Minnesota State University, Spring 2020

Senior Design /Capstone Project

Mechanical Engineering Design

ME 4391: Mechanical Engineering Design II — Texas State University, Spring 2026- Present
ME 4390: Mechanical Engineering Design I — Texas State University, Fall 2025- Present

Design Project

ME 438W: Design Project II — Minnesota State University, Spring 2019/2020
ME 428: Design Project I — Minnesota State University, Fall 2018/2019

Graduate Theses

- Co-advisor and Advisory Committee Member for the following Master's theses, Department of Biology, Texas State University:
  - "A novel device based on counter-current heat exchange for simultaneously studying factors affecting the thermal preference, CT_{MIN} & CT_{MAX} of small aquatic organisms" by Enzo Silvagni (2024 & 2025)
- Co-advisor and Advisory Committee Member for the following Master's theses, Mechanical Engineering Program, Minnesota State University:
  - "Optimized placement of vertical axis wind turbines (VAWTs)" by Joshua Dickinson (2021)
  - "Indoor navigation for visually impaired person using inertial and geomagnetic information" by Jayanth Ammanabrolu (2020)

Undergraduate Senior Design/Capstone Projects

- Senior Design Advisor, Texas State University:
  - "Game on 360 Mechanical Design Basis & Cooling Strategy " (Spring 2026 – Present)
  - "FSAE Passive Interconnected Hydraulic Suspension" (Fall 2025 & Spring 2026)
- Senior Design Advisor, Minnesota State University:
  - "Water-cooled single-server rack system" (Fall 2019 & Spring 2020)
  - "Gander Towers HVAC&R Design" (Fall 2018 & Spring 2019)

CURRICULUM DEVELOPMENT

- Designed and developed a graduate-level course in **Computational Fluid Dynamics (CFD)** from the ground up, including curriculum, lectures, assignments, and hands-on simulation projects.
- Led the development of **Thermal-Fluids Laboratory** course materials in collaboration with a faculty colleague, including laboratory experiments, instructional manuals, and assessment tools.
- Co-developed the freshman-level course **Introduction to Digital Mechanical Engineering** in collaboration with two faculty colleagues, with a primary focus on introducing students to **Industry 4.0 tools and technologies**, including digital engineering, CAD, programming, automation, additive manufacturing, sensors, data analytics, and emerging smart manufacturing concepts.
- Co-developed the **Introduction to Digital Mechanical Engineering Laboratory** in collaboration with two faculty colleagues, providing hands-on experience with Industry 4.0 technologies through CAD, engineering computation, digital manufacturing, programming, and project-based learning activities.
- Led the development of a freshman-level **Engineering Graphics** course in collaboration with a faculty colleague, integrating CAD and digital engineering tools to prepare students for modern engineering practice and Industry 4.0 environments.
- Led the implementation of **project-based learning (PBL)** methodologies across multiple undergraduate mechanical engineering courses in collaboration with a faculty colleague to enhance student engagement and experiential learning.
- Led the design and development of a **Thermal-Fluids Laboratory** in collaboration with a faculty colleague, including laboratory experiments, equipment selection, instructional materials, and safety procedures to support undergraduate mechanical engineering education**.**

PROFESSIONAL SERVICES

PROPOSAL REVIEWER

- **National Science Foundation (NSF)** – Reviewer for multiple **SBIR/STTR** proposals (2021).

JOURNAL REVIEWER

Reviewer for manuscripts submitted to the following **peer-reviewed journals**:

- *ASME Journal of Electronic Packaging*
- *ASME Journal of Thermal Science and Engineering Applications*
- *ASME Journal of Engineering and Science in Medical Diagnostics and Therapy*
- *Energy*

- *Energy and Buildings*
- *Journal of Applied Fluid Mechanics*
- *Entropy*
- *International Journal of Electrical Power and Energy Systems*
- *Science of the Total Environment*

CONFERENCE SERVICES

- **Student Poster Co-Chair**, 19th IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (**ITherm 2020**).
- Reviewer for technical papers submitted to **ASME** and **IEEE ITherm** conferences.

UNIVERSITY AND DEPARTMENTAL SERVICES

Texas State University

- Member, Mechanical Engineering **ABET Assessment and Program Development Committee**.
- Member, **Non-Tenure Track Career Advancement Task Force**.
- FY24 **ITOC Committee** Member.
- Member, **Scholarship Committee**.
- Member, **Mechanical Engineering Faculty Search Committee**.

Minnesota State University

- Department Representative for **Laboratory Safety**, Mechanical and Civil Engineering Department.

Boise State University

- Member, **Program Operations Committee**.
- Member, **Curriculum Alignment Team**, Department of Mechanical and Biomedical Engineering.

Rowan University

- Department Representative for **Undergraduate Scholarship Selection**, Mechanical Engineering Department.

PROFESSIONAL MEMBERSHIPS

- American Society of Mechanical Engineers (**ASME**), *Member*
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (**ASHRAE**), *Member*
- American Society for Engineering Education (**ASEE**), *Member*
- Institute of Electrical and Electronics Engineers (**IEEE**), *Member*

INDUSTRY EXPERIENCE

IRANIAN FUEL CONSERVATION COMPANY (IFCO) — TEHRAN, IRAN

DEPARTMENT HEAD – FUEL ECONOMY STANDARDS IN THE TRANSPORTATION SECTOR JANUARY 2006 – MAY 2008

- Led the Fuel Economy Standards Department, overseeing engineering projects related to energy efficiency and fuel conservation in the transportation sector.
- Managed multidisciplinary engineering teams responsible for developing and implementing fuel economy standards and technical guidelines.
- Collaborated with government agencies, industry stakeholders, and research organizations to support national energy conservation initiatives.

RESEARCH AND PROJECT ENGINEER OCTOBER 2003 – DECEMBER 2005

- Conducted engineering research and technical analyses to improve energy efficiency in transportation systems.
- Developed and evaluated fuel conservation technologies, thermal systems, and energy management strategies.

- Participated in multidisciplinary engineering projects involving thermal-fluid systems, energy conversion, and transportation energy policy.

SAIPA AUTOMOTIVE GROUP — TEHRAN, IRAN

MECHANICAL ENGINEERING INTERN SUMMERS 1998 & 1999

- Assisted engineering teams in automotive design, manufacturing, and testing activities.
- Gained practical experience in mechanical systems, production processes, quality control, and automotive engineering.

HONORS AND DISTINCTIONS

- **NSF IUCRC Breakthrough Recognition (2014)** – Postdoctoral research selected as one of the **National Science Foundation Industry–University Cooperative Research Centers (IUCRC) Breakthroughs** and showcased to Members of Congress, the White House, and congressional staff as a notable example of NSF-supported research with industrial impact.
- **Graduate Academic Excellence** – Ranked **3rd** among **40 students** admitted to the Master of Science program in Mechanical Engineering at **K. N. Toosi University of Technology**, Tehran, Iran (2000).