Hamidreza
Khoshtarash Sangbejari

Curriculum Vitae

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📍 California, Davis

Profile

Graduated with a master's degree (ranked 1st and among top 3% of the department; selected as the best student) in Mechanical Engineering with published journal articles, fluent in English and proficient in technical tools; with more than five years of research and teaching experience, currently study Ph.D. program in civil and environmental engineering in UC Davis. I am interested in developing and validating numerical models for multiphase flow, environmental flows, and transport in porous and confined media and up-scaling these processes. I use various mathematical tools, including finite volume and finite element techniques, and many more. As a researcher, I contribute to developing a range of open-source software as part of my passion.

Education

PhD, Research Associate at Civil and Environmental Engineering
2024- present

University of California, Davis

Thesis Title: *"Hydrodynamics and reactive transport in bioclogged porous media"*

Master of Science in Mechanical Engineering
2019 - 2021

Iran University of Science and Technology, Tehran, Iran

- *Ranked 301-350th in QS World University Rankings by Subject 2022, Mechanical, Aeronautical & Manufacturing Engineering*

GPA: *18.88/20.00*

Thesis Title: *"Pore-scale Analysis of Two-phase Nanofluid Flow and Heat Transfer in Open-cell Metal Foams by Considering Brownian Force"* (**Grade:** *20/20*)

Supervisor: Dr. Majid Siavashi

Bachelor of Science in Mechanical Engineering
2013 - 2018

Urmia University of Technology, Urmia, Iran

Final Project Topic: *"Investigation of the Effects of Nanofluid Flows on the Performance of Double-pipe Heat Exchangers"* (**Grade:** *20/20*)

Supervisor: Dr. Saber Yekani Motlagh

Research Interests

- Multi-phase Flow Modeling
- Computational Fluid Dynamics (CFD)
- Computational Heat Transfer
- Pore-scale Modeling
- Transport Flow in Porous Media
- Machine Learning

Language Competence and Test Scores

Persian *(Native)*, English *(Fluent)*, French *(Advanced)*

TOEFL iBT:

Overall Score:	Reading:	Writing:	Listening:	Speaking:
105	27	27	29	22

GRE:

Overall Score:	Verbal Reasoning:	Quantitative Reasoning:	Analytical Writing
330	160	170	4.0

Publications
Journal Articles:
1. Sadr, Arsalan Nasiri, Masih Shekaramiz, Meysam Zarinfar, Amin Esmaily, **Hamidreza Khoshtarash**, and Davood Toghraie. "*Simulation of Mixed-Convection of Water and Nano-Encapsulated Phase Change Material inside a Square Cavity with a Rotating Hot Cylinder*." **Journal of Energy Storage 47**, **2022** ([Link](#))
2. **Hamidreza Khoshtarash**, Majid Siavashi, Milad Ramezanpour, Martin Blunt. "*Pore-scale analysis of two-phase nanofluid flow and heat transfer in open-cell metal foams considering Brownian motion*." **Journal of Applied Thermal Engineering**, **2023** ([Link](#))
3. Milad Ramezanpour, **Hamidreza Khoshtarash**, Majid Siavashi, Martin Blunt. "*Transport and deposition of nanoparticles in porous media at the pore scale using an Eulerian-Lagrangian method*." **Journal of the Taiwan Institute of Chemical Engineers**, **2024** ([Link](#))

Technical Skills
- OpenFOAM
- Python
- Ansys Fluent
- C++
- MATLAB
- Fortran

Professional and Academic Experience
- **Teaching Assistant** *2020*
  - Advanced Engineering Mathematics
  - Continuum Mechanics

  Iran University of Science and Technology, Tehran, Iran

- **Teaching Assistant** *2018*
  - Fluid Mechanics
  - Teaching OpenFOAM

  Urmia University of Technology, Urmia, Iran

- **Online Teaching** *2020*
  - English for intermediate

  Yas Institute, Tehran Iran

- **Online Teaching** *2021*
  - French for beginners

  Yas Institute, Tehran Iran

Related Courses and Academic Projects

Advanced Engineering Mathematics	*19.5/20*	Continuum Mechanics	*20/20*
Advanced Heat Transfer	*18.5/20*	Advanced Thermodynamics	*18.2/20*
Radiation Heat Transfer	*20/20*	Heat Transfer II	*20/20*

Selected Projects:
- **Conjugate natural convection inside hybrid nanofluid-filled annulus using two-phase model:**
  - *Simulation and investigation of two-phase natural convection heat transfer in tubes filled with hybrid nanofluid. In this project, various nanofluids have been investigated inside the annular tubes to investigate the displacement heat transfer. Coding and simulation in OpenFOAM*
- **MHD nanofluid free convection inside cavity:**
  - *In this project, the effects of magnetic field on natural convection heat transfer in a square cavity by nanoparticles were investigated. Coding and simulation in OpenFOAM*
- **International astronomical search collaboration:**
  - *Member of the asteroid discovery research team. Identification in near-Earth object observations and discoveries of main belt asteroids*
- **Numerical analysis of natural convection heat transfer of nanofluids in a square cavity:**
  - *Investigating and simulating the natural heat transfer of nanofluids in a square cavity. Coding and simulation in OpenFOAM*
- **Pore-scale simulation of nanofluid flow in porous media reconstructed by micro-tomography images:**

- *Pore-scale simulation of nanofluid flow in porous media reconstructed by micro-tomography images.*
- *These images were sent from Imperial College London and simulation and coding were done in OpenFoam software.*
- **Energy and exergy analysis of the Combined Cycle, consisting of solid oxide fuel cell (SOFC) and Stirling cycle:**
  - *In this project, a combined ammonia power plant with a gas turbine and a solid oxide fuel cell system, along with a Stirling cycle and an organic Rankine cycle, was considered, and simulation and coding were done in MATLAB software.*

Certifications

- Energy systems optimization training course with MATLAB programming (Tehran University, Iran, 2021)
- Artificial intelligence course focusing on programming in Python, machine learning and deep learning (Tehran University, Iran, 2021)

Memberships

- Member of the astronomy research team, Urmia University
- Member, Utech Academy of Tehran university

Honors and Awards

- **Head of the Mechanical Engineering Scientific Association**, Iran University of Science and Technology
- Selected as the **best student** of Mechanical Engineering, Iran University of Science and Technology, **2020**

Conferences and Workshops

- Hydrogen production using microbial electrolysis cells, The 6th International Conference on Emerging Trends in Energy and Environment Conservation (ETEC), (Tehran university, Tehran, Iran 2017)
- Experimental investigation of the effect of different orientations on heat transfer of a smooth rectangular rotating channel, The 7th National Gas Turbine Conference (Iran University science and technology, Tehran, Iran 2022)
- OpenFOAM programming teaching workshop at the University of Science and Technology (Urmia university of technology, Urmia, Iran 2016)
- English programming teaching workshop at Urmia University of Technology, 2015
- French programming teaching workshop at Urmia University of Technology, 2017