Hossein (Aria) Seyedzadeh
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OVERVIEW

PhD researcher specializing in CFD modeling, heat transfer, and fluid dynamics with expertise in developing and validating thermal-fluid systems. Skilled in numerical simulations, data analysis, and optimizing designs for complex mechanical and thermal challenges.

EDUCATION

PhD in Civil Engineering **(**GPA: 3.8/4)
Stony Brook University, Stony Brook, NY *Expected 05/2026*
Relevant Coursework: Computational Fluid Dynamics, Transport Phenomena, Principles in Parallel Computing, Direct Energy Conversion, Advanced Fluid Mechanics, Environmental Fluid Dynamics.
Honors & Award: Best poster award at the UMERC + METS 2024 conference.

Master of Science in Mechanical Engineering (GPA: 3.5/4)
Isfahan University of Technology, Esfahan, Isfahan *09/2020*
Relevant Coursework: Two-phase Flow and Heat Transfer, Advanced Thermodynamics, Convection Heat transfer, Micro/Nano Fluid Flows.

Bachelor of Science in Mechanical Engineering (GPA: 3.1/4)
University of Guilan, Rasht, Guilan *09/2016*
Relevant Coursework: Heat Transfer, Thermodynamics, Fluid dynamics, Gas Dynamics, Differential Equations, Numerical Methods.

SKILLS

Programming Languages: Python (proficient in AI/ML workflows, including PyTorch), C++ (debugging and module development for CFD), MATLAB (data analysis and visualization).
AI and Machine Learning: PyTorch (CNN-Autoencoder optimization), Jupyter Notebook (interactive modeling).
Data Processing and Visualization: Pandas, NumPy, Matplotlib, NetCDF, Tecplot, Paraview.
CFD and Thermal Simulation Software: OpenFOAM, ANSYS (Mechanical & Fluent), FloTHERM.
High-Performance and Scalable Computing: Linux/Unix (Bash scripting, HPC workflows), MPI, OpenMP.
CAD Software: SolidWorks, Catia, AutoCAD.
Version Control: Git, GitHub (collaborative development).
Additional Tools: LaTeX (scientific documentation), Blender (3D visualization), Adobe Photoshop.

WORK EXPERIENCE

Antora Energy Sunnyvale, CA
Heat to Power R&D Intern *06/2024 – 08/2024*
- Conducted thermal modeling and analysis using ANSYS Mechanical, simulating heat transfer and optimizing geometries for efficiency.
- Developed and optimized 3D CAD designs in SolidWorks for thermal battery components, supporting simulation workflows and parametric analyses.
- Documented and presented numerical simulation workflows, enabling seamless integration of simulation results into broader engineering projects.

Department of Civil Engineering, Stony Brook University Stony Brook, NY
PhD Research Assistant *08/2022 - Present*
- Developed high-fidelity fluid dynamics models using the VFS Geophysics open-source code, simulating complex hydrodynamic and aerodynamic systems on HPC clusters.
- Conducted numerical investigations of turbulent flows using LES and RANS turbulence models, providing insights into renewable energy and environmental applications.
- Created custom workflows for post-processing high-resolution flow data with Python, MATLAB, Tecplot, and Paraview to analyze turbulence and flow structures.
- Validated CFD results against experimental data, ensuring accuracy and applicability for real-world fluid dynamics systems.
- Collaborated with interdisciplinary teams to integrate computational insights into system designs, addressing challenges in fluid flow optimization and performance evaluation.
- Improved Convolutional Neural Network algorithms for fluid dynamics predictions as an alternative to high-fidelity CFD simulations.

Department of Mechanical Engineering, Isfahan University of Technology Isfahan, Iran
Graduate Research Assistant *09/2018 – 09/2020*
- Performed CFD simulations of microscale fluid flow and heat transfer in an electroosmotic micropump using an in-house Fortran code to optimize thermal and flow performance.
- Worked on developing a custom OpenFOAM solver to replicate and enhance simulation capabilities for microscale flow modeling.
- Validated simulation results against theoretical predictions and experimental data, ensuring accuracy in performance evaluations.

RESEARCH PUBLICATIONS

9 publications (journal and conference), 32 citations (google scholar).

ONLINE CERTIFICATES

A Hands-on Introduction to Engineering Simulations, Certificate | Fundamentals of Fluid-solid Interaction, Certificate.