Mahdi Farsi

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Professional Summary

- Accomplished PhD candidate in Mechanical Engineering with over eight years of research experience in advanced Computational Fluid Dynamics (CFD), large eddy simulation (LES), turbulent flow, heat transfer, two-phase flow, and wind energy applications.
- Expert in executing CFD analyses through both commercial software (Ansys Fluent, CONVERGE CFD) and custom code development (Fortran, C, Python).
- Proven record of designing and implementing advanced simulation strategies, leading to impactful publications and successful collaboration in multidisciplinary research teams.

Professional Experience

Graduate Research Assistant *Houston, TX*
CFD and Turbulence Modeling Group, University of Houston *Jan 2021 – Current*

- Performed large eddy simulations (LES) of pollutant transport and dispersion from a localized source in oceanic and atmospheric environments using the open-source LESGO-JHU.
- Developed cognitive algorithms to solve the inverse problem of pollution source localization using autonomous robots under sparse sensing conditions.
- Performed large eddy simulations (LES) of ship channel and shallow bay interactions under wind and wave forcing to understand turbulent mixing mechanisms between a shallow bay and a deep ship channel.
- Conducted particle image velocimetry (PIV) of vertical-axis wind turbine wake flows to analyze the impact of blade helicity on wake characteristics.
- Performed detached eddy simulations (DES) of incompressible flow through various Master Flo Valve (USA) choke valve designs using Ansys Fluent to evaluate flow-induced corrosion in each design.
- Numerical modeled of a novel design for metal-organic chemical vapor deposition (MOCVD) equipment, capable of manufacturing superconductor tapes with superior electrical performance, using Ansys Fluent.

Graduate Teaching Assistant *Houston, TX*
University of Houston *Jan 2021 – Current*

- Served as teaching assistant in courses: Fluid Dynamics, Heat Transfer, Thermodynamics, and Experimental Methods.
- Mentored students through office hours and one-on-one communication
- Graded exams and assignments and reporting individual progress to the instructor.

Research Assistant *Mashhad, Iran*
Heat Transfer Research Center, Ferdowsi University of Mashhad *Sep 2019 – Dec 2020*

- Investigated heat transfer enhancement in mid-size heat exchangers through manipulating flow geometry, both numerically and experimentally.
- Proposed and numerically evaluated novel pattern of minichannel heat sinks for increasing heat absorption using Ansys Fluent.

Graduate Research Assistant *Tehran, Iran*
MAPFAN Research Institute, University of Tehran *Jan 2017 – Aug 2019*

- Studied heat transfer mechanism in mid-size air-cooled turbogenerators using numerical simulation with Ansys Fluent.
- Developed correlations for convective heat transfer coefficient in different cooling paths of air-cooled turbogenerators using statistical techniques.

Education

Ph.D. in Mechanical Engineering, Thermal Fluid Systems *Expected Aug 2025*
University of Houston, Houston, TX

Master of Science in Mechanical Engineering, Thermal Fluid Systems *Jan 2019*
University of Tehran, Tehran, Iran

Bachelor of Science in Mechanical Engineering *Jul 2016*
Sharif University of Technology, Tehran, Iran

Skills

- **Programming & HPC:** Python, Fortran, MATLAB, C, Open MPI
- **CFD & Simulation Tools:** Ansys Fluent, CONVERGE CFD
- **CAD & Design:** SolidWorks, Ansys SpaceClaim
- **Data Analysis & Post-Processing:** ParaView, Ansys CFD-Post
- **AI Framework & Libraries:** Tensorflow, Keras
- **Laboratory & Experimental:** Wind tunnel testing, Particle Image Velocimetry (PIV), thermal measurement/instrumentation

Awards

- 2024 Bidani scholarship Award for Ph.D. students
- 2023 General Scholarship Award for Ph.D. students
- 2022 American Bureau of Shipping (ABS) Academic Excellence Endowed Scholarship
- 2021 Future Faculty Program (FFP) Fellowship

Publications

M. Farsi, D. Yang, *2024*
"Application and Evaluation of Cognitive Search Algorithms for Pollutant Source Localization in Atmospheric Boundary Layer Flows: A Large Eddy Simulation-based Study", Bulletin of the American Physical Society.

M. Farsi, M. Li, J. Breier, S.A. Socolofsky, D. Yang, *2023*
"Large-eddy simulations of ship channel and shallow bay interactions under wind and wave forcings", 76th Annual Meeting of the Division of Fluid Dynamics.

M. Farsi, M.J. Shariatzadeh, M.A. Bijarchi, E.P. Masouleh, M.B. Shafii, *2021*
"Low-speed wind energy harvesting from a vibrating cylinder and an obstacle cylinder by flow-induced vibration effect", International Journal of Environmental Science and Technology.

M. Khoshvaght-Aliabadi, E. Hosseinirad, **M. Farsi**, F. Hormozi, *2021*
"Heat transfer and flow characteristics of novel patterns of chevron minichannel heat sink: An insight into thermal management of microelectronic devices", International Communications in Heat and Mass Transfer 122, 105044.

M. Farsi, M. Khoshvaght-Aliabadi, A. Alimoradi, *2021*
"A parametric study on heat transfer and pressure drop characteristics of circular tube with alternating flattened flow path", International Journal of Thermal Sciences 160, 106671.

M. Khoshvaght-Aliabadi, **M. Farsi**, S.M. Hassani, N.H. Abu-Hamdeh, A. Alimoradi, *2021*
"Surface modification of transversely twisted-turbulator using perforations and winglets: An extended study", International Communications in Heat and Mass Transfer 120.

M. Farsi, S. Karbalayi, F. Kowsari, P. Hanafizadeh, *2020*
"Effect of radial injection on heat transfer of a Taylor–Couette–Poiseuille flow", Numerical Heat Transfer, Part B: Fundamentals 77 (3), 271-285.