Gulzar Ali

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Summary

Aspiring computational scientist with expertise in fluid mechanics, machine learning, and CFD simulations, seeking to contribute to cutting-edge research in multi-scale and data-driven modeling.

Education

National University of Sciences and Technology (NUST) Islamabad, Pakistan
Master of Science in Computational Science and Engineering (CSE) *Jan. 2023 – Present*
CGPA: 3.25/4.00

Courses: Computing for CSE, Computational Linear Algebra, Applied Mathematics, Advanced Partial Differential Equations, Applied Machine Learning, Data Analysis and Statistics

University of Engineering and Technology (UET) Lahore, Pakistan
Bachelor of Science in Mechanical Engineering *Oct. 2018 – Aug. 2022*

Experience

CFD Support Engineer March 2025 – Present
Forbmax

- CFD Support and Training for KAUST
- Developing CFD cases for HPC frameworks tailored for clients
- Providing CFD Consultancy for R&D in Academia and Industry

CFD Applications Developer Jun. 2024 – Oct. 2024
DenseFusion and Redstart Technology Solutions *Islamabad, Pakistan*

- Practical experience in Computational Fluid Dynamics (CFD) and High Performance Computing (HPC)
- Development and optimization of scalable CFD applications
- Hands-on training and problem-solving sessions
- Collaborative project work, enhancing both technical knowledge and applied research skills

Projects

Deep Learning-Enhanced CFD Approach in Data Centers | *ANSYS, Python, Pytorch* May 2024 – Present
Master's Thesis, NUST

- CFD modelling of a data center
- Trained deep learning models on the generated CFD dataset to predict hotspots in racks

Simulation of Fluid Flow in Porous Media | *COMSOL Multiphysics* Oct. 2017 – Aug. 2018
Bachelor's Thesis, UET

- Developed a model of fluid flowing through a porous media used in Time Temperature Indicators
- Simulated for different geometries and fluids used to reduce the wicking time

Simulation of 2D Advection-Diffusion Equation Using MPI in Python | *Python, MPI* Jun. 2024 – Aug. 2024
Parallel Computing Workshop 2024, DenseFusion

- High Performance Computing and Parallel Computing
- Developed parallel Advection-Diffusion Codes
- Analyzed code performance using scalability tests

Calculating Lift and Drag using Second Order Vortex Panel Method | ***Matlab***
Computational Aeronautics Lab, NUST

- Airfoil modelling using mathematical equations
- Applied the Vortex Panel Method to compute lift and drag at various angles of attack, improving understanding of aerodynamic behavior

Development of AI applications for flow prediction using CNN and GNN | ***Ansys, Pytorch***
Forbmax

- Flow modelling for CFD problems like Backward Facing Step and Simple Cylinder
- Parametric simulations for data generation
- AI models development and testing

Technical Skills

Languages: Python, C/C++
Software's and Operating Systems: ANSYS, COMSOL Multiphysics, OpenFOAM, Linux
Developer Tools: Git, Docker, Visual Studio Code, PyCharm
Libraries: Pandas, NumPy, Matplotlib, Pytorch, mpi4py, keras, Pytorch

Certifications

- **Developing Scalable CFD Applications Powered by HPC** Oct. 2024
  CFD, MPI, Scalable Applications
- **The Data Science Boot Camp 2022** Sept. 2022
  Machine Learning, Data Visualization, Statistical Analyses
- **Foundations of Project Management** Sept. 2022
  Project LifeCycle, Risk Management, Agile Methodology
- **How To Write and Publish a Scientific Paper** Feb. 2022
  Literature Review, Manuscript Preparation, Peer Review Process

Publications

- Ali, G., Sheikh, K. A., Shahbaz, F., Mushtaq, A., Zafar, M. I., and Jabbar, A. U. Real-Time Thermal Field Prediction in Data Center Using Deep Learning Surrogates for CFD.
  Submitted to Proceedings of the International Bhurban Conference on Applied Sciences and Technology (IBCAST 2025), IEEE (Under Review).

Reference

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