Gulzar Ali

☎ +923105955186 | ✉ gulzarali05@gmail.com | 🔗 linkedin.com/in/G-Ali-engr | ⚙ github.com/gulzarali19

SUMMARY

Aspiring computational scientist with expertise in fluid mechanics, machine learning, and numerical modeling, seeking to contribute to cutting-edge research in CFD-ML integration.

EDUCATION

National University of Sciences and Technology (NUST) — Islamabad, Pakistan
Master of Science in Computational Science and Engineering (CSE) — *Jan. 2023 – Dec. 2025*
CGPA: 3.4/4.00

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*

PUBLICATIONS

Ali, G., Khalid, E., Khan, H., & Mushtaq, A. **"CNN-Based Surrogate Model for Rapid Prediction of Flow Fields in Early-Stage Urban Design and Planning."** *5th International Conference on Digital Futures and Transformative Technologies (ICoDT2)*, Islamabad, Pakistan, (To Appear in IEEE Xplore Proceedings, 2025).

EXPERIENCE

CFD Support Engineer — March 2025 – Present
Forbmax
- Developing CFD cases for HPC Frameworks tailored for Clients
- Providing CFD Consultancy for R&D in Academia and Industry

Research Assistant — Jan. 2025 – Present
Super Computing Lab
- Investigating DRL methods for two equation closure models
- Improving RANS Simulation for Cold-Wall Hypersonic Flows

Research Assistant — Jan. 2025 – Present
Computational Aeronautics Lab
- Development of surrogate model for rapid prediction of urban flows- Digital Twin for investigating pollutant dispersion and comfort zones for pedestrians
- Investigating PINNs for mean flow reconstruction for Hill-flow Problem

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

Augmented Machine Learning in Turbulence Models | *OpenFOAM, Python* — Nov. 2025 – Present
Super Computing Lab, NUST

Identify and approximate parameters within two-equation Turbulence model using machine learning to reduce RANS mean flow field error

Convolutional and Graph-NN on Benchmark CFD Cases | *ANSYS, Pytorch* — July 2025 – Present

Forbmax

Developed models for flow prediction under encoded initial parameters. Automate CFD data generation for Backward Facing Step and Cavity Flow

PINNs for Mean-Flow Reconstruction in CFD | *Python, Pytorch*   Oct. 2025 – Present
Forbmax

Exploring PINNs for Forward and Inverse Problems, making tutorials for 1D-Burger's Equation for Academia

Surrogate Model for Rapid Prediction of Urban Flows | *Python, Pytorch*   Sept. 2025 – Oct. 2025
Computational Aeronautics Lab, NUST

Proposed DL model that can learn flow patterns around buildings for early stage design and planning

Advection-Diffusion Equation using MPI in Python | *Python, MPI*   Jun. 2024 – Aug. 2024
Parallel Computing Workshop 2024, DenseFusion

Simulated Advection-Diffusion Equations to investigate code performance on High Performance Computing using Parallel Computing

CFD-DL Hybrid Thermal Model For Hotspot Mitigation | *ANSYS, Python*   May 2024 – Dec. 2025
Master's Thesis, NUST

Development of DL model for real time prediction of Thermal fields within Racks using Conditional Decoders contributing towards active thermal management and rapid design space exploration

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

Simulating darcy's law for modeling of imbibition process in porous media for the development of Flexible Time-Temperature Indicators

TECHNICAL SKILLS

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

CERTIFICATIONS

- **Developing Scalable CFD Applications Powered by HPC** | *Densefusion*   Oct. 2024
  CFD, MPI, Scalable Applications

- **The Data Science Boot Camp 2022**| *365datascience*   Sept. 2022
  Machine Learning, Data Visualization, Statistical Analyses

- **Foundations of Project Management**| *Google*   Sept. 2022
  Project LifeCycle, Risk Management, Agile Methodology

- **How To Write and Publish a Scientific Paper**| *Ecole Politechniq*   Feb. 2022
  Literature Review, Manuscript Preparation, Peer Review Process

REFERENCE

Dr. Rooh Khurram

Staff Scientist
Core Labs: KAUST Supercomputing Lab
King Abdullah University of Science and Technology, Saudi Arabia
Tel: +966 (12) 808 0383
Mobile: +966 (0) 544701571
Email: rooh.khurram@kaust.edu.sa

Dr. Ammar Mushtaq

Associate Professor
School of Interdisciplinary Engineering & Sciences (SINES)
National University of Sciences and Engineering (NUST), H-12, Islamabad, Pakistan
Office: +92-51-8865736
Mobile: +92-323-4563474
Email: ammar.mushtaq@sines.nust.edu.pk

Dr. Absaar ul Jabbar

Assistant Professor
School of Interdisciplinary Engineering & Sciences (SINES)
National University of Sciences and Engineering (NUST), H-12, Islamabad, Pakistan
Tel: +92-51-9085725
Email: absaar@sines.nust.edu.pk