Azhar Gafoor CTP

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Education

Indian Institute of Science **Aug. 2022 – Ongoing**
PhD in Computational and Data Science. CGPA: 9.80 *Bangalore, KA, India*

Indian Institute of Technology Madras **Aug. 2020 – April 2022**
M. Tech in Thermal Engineering. CGPA: 9.79 *Chennai, TN, India*

College of Engineering, Trivandrum **Sep. 2011 – April 2015**
B. Tech in Mechanical Engineering. CGPA: 8.44 *Trivandrum, KL, India*

Achievements

- Secured All India Rank **565 (99.59 percentile)** out of 137826 in GATE 2020 conducted by IIT Delhi.
- Selected for the **Prime Minister's Research Fellowship (PMRF)** which is awarded to **3.5%** of the existing PhD student

Relevant Coursework

- Numerical Optimization
- Numerical Linear Algebra
- Environmental Data Analytics
- Non-Linear Model in Climate Sciences
- Environmental Fluid Dynamics
- Incompressible Fluid Flow
- Inverse Methods in Heat Transfer
- Micro & Nanoscale Energy Transport
- Numerical Methods in Thermal Engineering
- Foundation of CFD

Experience

Bharat Petroleum Corporation Limited **June 2015 – March 2019**
Assistant Manager Operations *Belagavi, KA, India*

- Created an internal control of day-to-day transactions and punctually opened and closed business activities.
- Taught employees how to collaborate on daily tasks and achieve service targets. Effective time management reduced working hours by 20% and thereby eliminating overtime.
- Coordinated with engineering and projects (E&P) team to revamp 6 bay tank lorry filling gantry (TLFG) to 8 bay without affecting retail operations, and while upgrading tank farm and gantry automation by LnT.
- Helped a team of 20 maintain business professionalism by coaching each on methods for delivering exceptional service to every customer.
- Accomplished objectives by undertaking department activities during the absence of the line manager.
- Handled different work areas such as Maintenance, HSSE (Health, Safety, Security and Environment) and Planning & Supply.

Course Projects

Physics Informed Neural Networks(PINNs) to simulate fluid flows | *Python, Tensorflow, Keras* **IISc May 2023**

- PINNs model was developed to simulate laminar flow in a channel.
- The results show agreement with the analytical and CFD solution of Navier-Stokes equation for laminar channel flow.

Document Image Classification | *Python* **IISc Dec 2022**

- Two ML models, Convolutional Neural Network (CNN) and Logistic Regression (perceptron), were developed to classify images to 16 different classes using a train and test set of labelled 16000 images.
- CNN model gave a test accuracy of 72.27 %, whereas the logistic regression model gave 84.20%.

Numerical Solution for Lid Driven Cavity | *Python, Finite Difference Method* **IITM May 2021**

- Finite Difference Method (FDM) was used to solve benchmark lid-driven cavity problem and the accuracy of the method was validated using Ghia et al. data (1982).
- Analysed the contours of Pressure and Velocity, Streamlines for different Reynolds numbers.

Term Papers

- **Applications of Micro/Nano Fluidics in Energy Conversion**
- **Study On Lattice Boltzmann Method And High-Order Upwind Compact Finite-Difference LBM**

Projects

A Three-Dimensional Simulation of Non-Newtonian Blood Flow Through Irregular Arteries Using Off-Lattice Boltzmann Method | *Fortran, LBM* **June 2021 – May 2022**

- Developed off-lattice Boltzmann solver in three-dimensional cylindrical coordinates to simulate non-Newtonian blood flows under pulsatile conditions.
- Derived expression for non-Newtonian source term using Chapman-Enskog (CE) expansion.
- Validated the solver for shear thinning and thickening behaviour of blood using Power-law model.
- A model irregular stenosis is constructed using cosine and sine function to investigate the effect of various geometric and flow parameters on the blood flow dynamics under pulsatile inflow condition.
- Systematically investigated the effect of degree of surface irregularity of the stenosis and the shear-thinning effect of blood on the flow dynamics.

Vibrational Analysis of Flow Through Pipes | *ANSYS* **Aug. 2014 – April 2015**

- Determined the fundamental vibration frequency of viscoelastic polyurethane pipe without mass, with added mass, and with flow.
- Validated the analytical data and results obtained using ANSYS fluid-structure interaction simulation with that from the experimental data.

Technical Skills

Languages: Python, C++, LaTeX
Developer Tools: VS Code, Google Cloud Platform
Technologies/Frameworks: Linux, GitHub, MATLAB, ANSYS Fluent, OpenFOAM, ParaView

Co-Curricular / Extracurricular

- Certification in 3-day Practical Fire Fighting training organized by Institute of Petroleum Safety, Health & Environment Management, ONGC, Goa from 18/01/2016 to 20/01/2016.
- Participated in a Glider Design and Fabrication Workshop organized by Aerotrix on 15/09/2012.
- Participated in the event 'Why Engineering?' at the annual technical fest Drishti '12 of College of Engineering, Trivandrum.