Arnab **Ghosh**

PhD Student · Engineer · Physicist · Programmer

@ arnab.sphs12@gmail.com linkedin/arnab-ghosh +(31) 6252524768
github/arnab-ghosh Eindhoven, Netherlands

Indian 21/10/1993

About me

A passionate PhD student of Applied Physics with experience in programming, CFD, large data analysis and visualisation. Looking for challenging roles in programming, machine learning and data analysis.

Work experience

May 2019 - Present

PhD in Applied Physics / Software Developer

- EINDHOVEN UNIVERSITY OF TECHNOLOGY
  - **Developer and maintainer** of in-house code LBE3D for solving fully resolved particles in complex fluid flow problem with multiphase in 3D using **C Language** on **Linux**
  - Understanding the effects of solid particles on the physics of inkjet printing technology using numerical methods (LBM) through collaborations with Twente University
  - Utilised Snellius **HPC** for computational power using **SSH-clients**
  - Maintained a **Git** repository through the utilisation of **CI/CD** pipelines
  - Analysis using **NumPy** and **Pandas** and visualisation of large datasets using **ParaView, Matplotlib**, and **Gnuplot**
  - Documentation of developer issues using **Markdown** and **LaTeX**
  - Submitted and published articles in peer-reviewed journals

July 2016 - June 2018

Mechanical Engineer / Fluid Thermal

- INDIAN INSTITUTE OF TECHNOLOGY
  - Developed **C** code from scratch for the study of fluid-particle interaction in 2D
  - Utilised **Tecplot** for visualisation and **LaTeX** for documentation
  - Made extensive use of **Bash, Linux** and **SSH-clients**

2022 - Present

Machine Learning (Deep Learning / Artificial Intelligence)

- EINDHOVEN UNIVERSITY OF TECHNOLOGY
  - JM Burgercentrum course on "**Fluid problems using Machine Learning**"; solved test cases with different models using **PyTorch** on **Jupyter notebook** (Logistic Regression, MLP, CNN)
  - Completed assignment tasks based on **Kaggle**
  - Solved popular test cases like MNIST digits, IMDB movie review, Boston housing dataset, California housing prices, Spam or Ham
  - Read and practiced books by **Aurélien Géron** and **François Chollet**

June 2015 - May 2016

Industrial / Commercial Software (Batchelor project)

- HERITAGE INSTITUTE OF TECHNOLOGY
  - Modelled a horizontal axis wind turbine blade using NACA aerofoils on **SolidWorks**
  - Analysed fluid flow over the turbine blade using **Ansys Fluent**
  - Analysed induced structural stress on the turbine blade with **Ansys Mechanical**

Education

2019 - Present — **Ph.D., Applied Physics** (expected May 2024)
- EINDHOVEN UNIVERSITY OF TECHNOLOGY, NETHERLANDS

2016 - 2018 — **Masters in Technology, Mechanical Engineering**
- INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI, INDIA

2012 - 2016 — **Bachelors in Technology, Mechanical Engineering**
- HERITAGE INSTITUTE OF TECHNOLOGY, KOLKATA, INDIA

Competencies / Skills

Programming Language	C language, Python, Bash, Git, MATLAB, Mathematica
Data analysis	NumPy, pandas, MS Excel
Machine Learning	TensorFlow, PyTorch, Keras, scikit-learn, Neural Networks, CNN, Logistic Regression, Multi Layered Perceptron
Data Visualisation	Matplotlib, ParaView, Tecplot 360, gnuplot, Blender
Design Software	SolidWorks, AutoCAD
Documenting/Editing	LaTeX, Markdown, VS Code, Sublime, MS Office, Emacs
Operating systems	Linux, MacOS, Windows

Teaching and Presentation

- Delivered my research as talks/posters at multiple international conferences in Netherlands, USA and India (including **APS**, JMBC, DSFD, FMFP)
- Accumulated **300+** hours of teaching experience to Bachelor's and Master's students at Eindhoven University of Technology
- Conducted **100+** hours of teaching Fluid Mechanics for Master's and Bachelor's students at Indian Institute of Technology Guwahati, India
- Provided **100+** hours of teaching to underprivileged children in Guwahati, India

Achievements

- Secured an All-India Rank of **1010** in the Graduate Aptitude Test in Engineering (**GATE**) out of **0.2 million** candidates
- Achieved an All-State Rank of 4038 in West Bengal Joint Entrance Exam (**WBJEE**) among **0.12 million** candidates
- Awarded a grant of **49 million** computational hours on Snellius as part of a 5-members group

Publications

- A. Ghosh, A. Gabbana, H. Wijshoff, and F. Toschi, Effective Force Stabilising Technique for the Immersed Boundary Method, Communications in Computational Physics 33, 349–366 (2023) 🔗 link
- A. Ghosh, S. Majumber, G. Natarajan, and D. N. Basu, Comparative Study of Two Immersed Boundary Approaches in the Lattice Boltzmann Framework, Proceedings of the 7th International and 45th National Conference on Fluid Mechanics and Fluid Power (FMFP), (2018) 🔗 link
- The list of publications can be found on 🔗 GoogleScholar/ArnabGhosh
- Contact information of referees can be provided upon request

Language proficiency

- English (TOEFL 109)
- Bengali (native)
- Hindi (native)
- Dutch (A1)