# Arnab **Ghosh**

PhD student

## About me

A passionate PhD student of Applied Physics with experience in programming to solve large scale fluid physics problems, data analysis and visualisation. Possessing youthful exuberance for learning machine learning and actively seeking challenging projects to work on within a team.

## Personal

Arnab Ghosh
nationality: Indian
1993

## Areas of specialization

Engineer · Physicist · Programmer

## Competencies

C / Python / Linux
Git / Bash / OpenMPI
SSH-clients / LaTeX
NumPy / Matplotlib
Paraview / MS Office
SolidWorks / Ansys Fluent

## Interests

Squash, Padel, Cooking, Hiking, Active portfolio management, Stock market and ETFs


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arnab-sphs12
Eindhoven, Netherlands


## Experience

May 2019 — Present

**PhD in Applied Physics/Software Developer**

Eindhoven University of Technology

- Understanding the effects of solid particles on the physics of liquid jetting in light of inkjet printing technology using numerical methods (**Lattice Boltzmann Method**)
- Collaborated with the Physics of Fluid group at Twente University for experimental data on the phenomenon of particle dynamics in liquid jetting
- 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** and **MacOS**
- Maintained a **Git** repository through the utilisation of **CI/CD** pipelines
- Analysis and visualisation of large datasets using **ParaView, Matplotlib/Python**, and **Gnuplot**
- Documentation of developer issues using **Markdown** and **LaTeX**
- Submitted and published papers in peer-reviewed journals on modelling, simulation and **fluid physics**

July 2016 — June 2018

**Mechanical Engineer/Software Developer**

Indian Institute of Technology Guwahati

- Developed **C** code from scratch for simulating in 2D fluid-particle interaction using a coupled **Immersed Boundary** and **Lattice Boltzmann** solver
- Utilised **Tecplot** for visualisation and **LaTeX** for documentation
- Made extensive use of **Bash** and **Linux**

1 week, 2022

**JM Burgercentrum course "Fluid problems using Machine Learning"**

Eindhoven University of Technology

- Solved multiple test cases with different models using **Pytorch** on **Jupyter notebook**
- Completed assignment tasks based on **Kaggle**

Jan 2015 — May 2016

**Modelling and Structural analysis of a horizontal axis wind turbine blade (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**

## Degree

2019—Present **Ph.D., Applied Physics**
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, India

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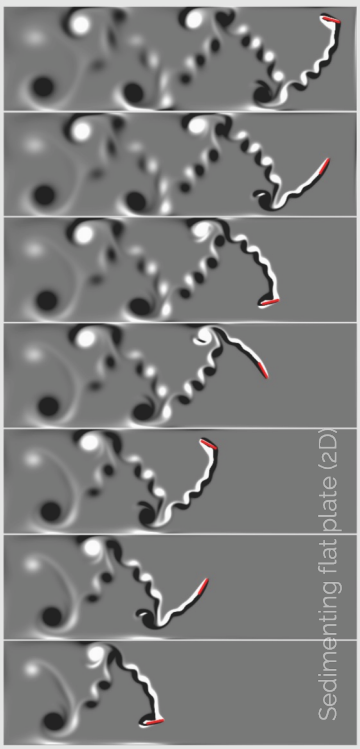


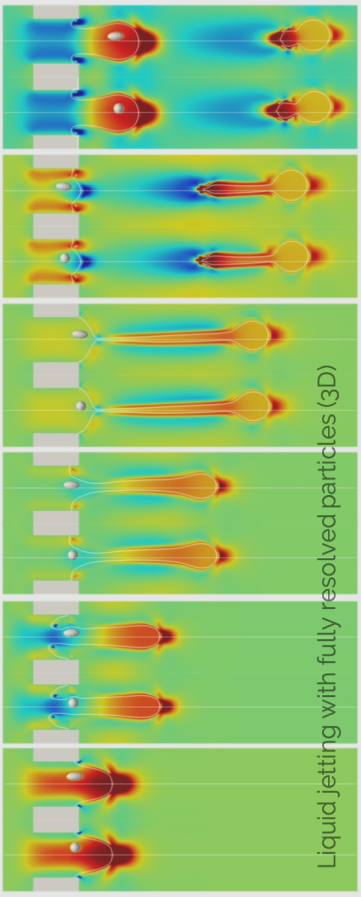


## Programming/Software

| | |
|---|---|
| **Programming Language** | C, C++*, Python, Bash, Git, MATLAB*, Mathematica* |
| **Data analysis** | NumPy, pandas, MS Excel |
| **Data Visualisation** | Matplotlib, ParaView, Tecplot 360, gnuplot |
| **Design Software** | SolidWorks, AutoCAD |
| **Documenting/Editing** | LaTeX, Markdown, VS Code, Sublime, MS Office, Emacs |
| **Operating systems** | Linux, MacOS, Windows |

* Elementary proficiency

## Presentations and Teaching

- 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)