ABHISHEK MUKHERJEE

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Professional Summary

Aerospace engineer focused on CFD, flow physics, and simulation automation. I am currently at IIST working on custom solvers, high-fidelity aerodynamic analysis, and Python-based tooling that speeds up design iterations. I love turning messy fluid dynamics into clean, actionable engineering insights. Now looking to bring this skillset into a fast-paced space startup where I can work across propulsion, aero, and systems-level challenges.

Education

Indian Institute of Space Science and Technology, Thiruvananthapuram — Aug 2024 – May 2026 *(Expected)*
M. Tech in Aerodynamics and Flight Mechanics

- **GPA:** 7.6/10 (upto second semester)
- **Coursework:** Flight Dynamics and Control, Computational Methods for Compressible Flows, Multi-Disciplinary Design Optimization, Design and Modelling of Rocket Propulsion Systems

Kalinga Institute of Industrial Technology, Bhubaneswar — Aug 2020 – May 2024
B. Tech in Aerospace Engineering (Hons.)

- **GPA:** 9.2/10
- **Coursework:** Aerodynamics, Atmospheric Flight Mechanics, Spaceflight Mechanics, Propulsion
- **Course Project:** Investigation of performance characteristics of two-dimensional convergent-divergent nozzles

Experience

Manufacturing Engineering Intern — Sept 2023 – Nov 2023
Tata Lockheed Martin Aerostructures Limited, Hyderabad

- Streamlined the MIS database refactoring process and tool order documentation by automating workflows using Visual Basic, significantly reducing manual effort and turnaround time.
- Supported process planning teams for the C130-J Empennage and F-16 Wings, gaining real-time exposure to assembly techniques and production management workflows.

Projects

Implementation of Kinetic Energy Preserving (KEP) scheme for compressible flows simulations (*ongoing*)

- Implementing stable and conservative split-forms of the convective fluxes for compressible gas dynamics equations for low dissipation simulations and validating against benchmark test cases.
- *Tools Used:* Python, and popular scientific libraries. HDF5 (.h5) file format for data storage.

Numerical solution of flow over airfoils using a constant-strength line vortex panel method

- Developed a panel method solution for a given airfoil geometry, implemented influence coefficient matrix formulation and applied Kutta condition for realistic trailing edge behavior.
- *Tools Used:* Python, XFOIL

Numerical simulation of the 6DOF motion of an aircraft model with control surface deflection response

- Simulated full 6DOF aircraft motion by solving coupled translational and rotational dynamics equations.
- Investigated dynamic response to elevator, rudder, and aileron inputs under trimmed flight conditions.
- *Tools Used:* Python

Investigation of aerothermodynamic performance of convergent – divergent nozzles in rocket engines

- Conducted CFD simulations on a planar nozzle geometry to analyze flow characteristics and performance metrics of 2D convergent-divergent nozzles under varying pressure ratios and convergence angles.
- Validated simulation results against published literature data for accuracy.
- *Tools Used:* ANSYS Fluent, CATIA, Python

Highlighted Skills

Languages: Python, C, C++, Bash Scripting, MATLAB, LaTeX

Software: ANSYS Fluent, CATIA, Paraview, OpenFOAM

Tools and Platforms: Git, Github, Linux, Jupyter Notebook, Quarto Publishing