Aditya Keshri

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Professional Summary

Master's student in Hybrid Electric Propulsion Technology focused on CFD, thermal management, BTMS, heat exchangers, HVAC fundamentals, and fluid-flow simulation. Experienced with ANSYS Fluent, OpenFOAM, MATLAB, Python, nTopology, CATIA, and ParaView for simulation, modelling, post-processing, and technical analysis. Currently working on CFD-based battery cooling using porous media and TPMS heat-exchange structures for electric aircraft applications, with growing focus on machine learning for flow modelling.

Technical Skills

- **CFD & Simulation:** ANSYS Fluent, OpenFOAM, CFD modelling, fluid-flow simulation, conjugate heat transfer, pressure drop analysis, turbulence modelling, boundary conditions, meshing, validation
- **Thermal Engineering:** Battery thermal management, heat exchangers, cooling ducts, porous media, HVAC fundamentals, duct flow, airflow distribution, pressure loss calculation, heat transfer, thermal-fluid systems
- **Programming & Data Analysis:** Python, MATLAB, machine learning for flow modelling, regression models, clustering, numerical analysis, simulation data processing
- **Design & Post-processing:** nTopology, CATIA, TPMS structures, CAD software, ParaView, result visualization, technical reporting

Relevant Experience

Study Project - Battery Thermal Management with Porous Media | BTU Cottbus-Senftenberg, Germany / Pusan National University | Aug 2025 - Present

- Conducted CFD simulations in **ANSYS Fluent** to study thermo-hydraulic performance, temperature uniformity, heat transfer behaviour, and pressure drop in battery cooling systems.
- Designed and optimized **TPMS-based heat-exchange structures** in nTopology for improved battery thermal management in electric aircraft applications.
- Performed **3D conjugate heat-transfer simulations** and analyzed trade-offs between cooling performance, pressure drop, and flow distribution in BTMS concepts.

Project Intern - Space Debris Drag Estimation | Indian Space Research Organization, Trivandrum, India | Jan 2023 - Sep 2023

- Investigated estimation methods for space debris characteristics such as **ballistic coefficient and radar cross-section** in Low Earth Orbit.
- Used **regression-based models and data analysis** to estimate drag-related parameters and identify correlations between orbital behaviour and debris characteristics.
- Gained experience in **MATLAB-based data analysis, numerical modelling, and aerospace simulation workflows**.

Selected Projects

Thermal Management Cooling Duct with Compact Heat Exchanger | DLR Institute / BTU Cottbus-Senftenberg

- Conducted experimental analysis of a cooling duct with a compact **louvered plate-fin heat exchanger**, measuring pressure drop and flow behaviour using static pressure taps, Pitot tube measurements, and temperature sensors.
- Evaluated heat-transfer and pressure-loss behaviour under varying airflow and coolant conditions, including Reynolds number and pressure drop analysis.

Drag Estimation for Space Debris | Bachelor's Final Year Project

- Estimated hard body radius and ballistic coefficient of LEO space objects using **machine learning-based regression, clustering, MATLAB, GMAT, and ANSYS Fluent**.
- Analyzed orbital and drag-related data to identify correlations between **radar cross-section, ballistic coefficient, and trajectory behaviour** for space debris characterization.

Education

Master's in Hybrid Electric Propulsion Technology | Brandenburg University of Technology Cottbus-Senftenberg, Germany | Oct 2024 - Present
Focus: CFD, thermal management, battery systems, heat transfer, OpenFOAM, machine learning for flow modelling

Bachelor's in Aeronautical Engineering with Machine Learning | APJ Abdul Kalam Technological University, India | Jun 2019 - Oct 2023

Languages

English: C1 | German: B1 | Hindi: Native | Malayalam: Basic