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SAHARSH GUPTA

PROFILE AND PORTFOLIO

- https://www.linkedin.com/in/saharshgupta87
- https://github.com/Spacefiber
- https://sahariscity.com/

EDUCATION

Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram
M.Tech, Aerodynamics and Flight Mechanics, Expected in 01/2027
ongoing

Vellore Institute of Technology, Bhopal
B. Tech, Aerospace Engineering, 01/2025
GPA: 8/10

PROFESSIONAL SUMMARY

Aerospace engineering graduate student with experience in computational fluid dynamics (CFD), numerical simulations, control systems, and scientific computing. Worked on satellite dynamics, UAV systems, reduced-order modeling, and machine learning applications for scientific datasets. Interested in aerospace systems, simulation technologies, high-performance computing, and engineering software development.

SKILLS

- Programming and Development: Python, MATLAB, C/C++, Linux, Git
- Technical Areas: CFD and Numerical Simulation, Dynamic System Modelling, Control Systems, Scientific Computing, GPU & Parallel Computing. Data Analysis and Visualization
- Simulation & Engineering Tools: OpenFOAM, Ansys, MATLAB/Simulink, Fusion 360
- HPC & Computing: CUDA, GPU Computing. Parallel Processing

EXPERIENCE

RESEARCH ASSISTANT 06/2024 to 09/2024
Aryabhatta Research Institute of Observational Sciences (ARIES), Nainital, India

- Developed machine learning models including CNNs, LSTMs, and Random Forests for time-series prediction tasks.
- Worked with large scientific datasets using Python and GPU-based computing environments.
- Built hybrid physics-informed computational models to improve simulation efficiency.
- Contributed to scientific workflows involving numerical analysis and data-driven modeling.

PROJECTS

Satellite Attitude Dynamics & Control Simulation (ADCS)

- Modeled rigid-body satellite attitude dynamics using quaternions
- Implemented detumbling (B-dot) and PID-based attitude control
- Simulated stabilization under disturbance torques and analyzed response
- Demonstrates direct relevance to ADCS/AOCS modes and SILS frameworks

High-Speed Open-Source UAV System

- Designed and developed a UAV platform focused on aerodynamic stability and control behavior.
- Integrated embedded electronics and tested actuator response characteristics.
- Explored feedback control and flight stability concepts in real-world operation.

Parallelized POD for Large CFD Datasets (GPU/MPI)

- Developed reduced-order modeling workflows for large CFD simulations.
- Accelerated computations using CUDA and MPI-based parallelization.
- Improved computational efficiency for high-volume simulation datasets.

Rotating Cylinder Aerodynamics Study

- Investigated lift and drag characteristics through CFD simulations.
- Studied wake behavior and aerodynamic effects under rotational flow conditions.

AREAS OF INTEREST

- Satellite Attitude Control (ADCS/AOCS)
- Guidance, Navigation & Control (GNC)
- Control System Design & Stability
- Simulation (SILS) and Digital Twin Systems

PUBLICATIONS

- Influence of Surface Friction on Lift Generation and Wake Dynamics of a Rotating Cylinder Using the Spalart–Allmaras Turbulence Model, 40th INDIAN ENGINEERING CONGRESS/Springer, 2025. ISBN: 978-81-993673-4-0

RELEVANT COURSEWORK

Boundary Layer Theory, Flight Dynamics and Control, Spacecraft Dynamics, Numerical Methods, Signals & Systems

LANGUAGES

English (Fluent)

Hindi (Native)

Russian (Intermediate)

HOBBIES

Reading (Frank Herbert, Nikolai Gogol), Chess