



Aswin D Menon

Bachelor of Technology
Aerospace Engineering
Indian Institute of Technology, Kharagpur

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INTERESTS

Aircraft Control Systems | Bio-Inspired Systems | Autonomous Flight | Missile Guidance | Helicopter Controls

EDUCATION

| Degree | Institute | CGPA/Percentage | Year |
|------------------------|-------------------------------------------------|-----------------|------|
| Bachelor of Technology | Indian Institute of Technology, Kharagpur | 8.64 | 2025 |
| Higher Secondary | Govt. Model HSS, Calicut (KBPE) | 97.17% | 2020 |
| High School | Bharatiya Vidya Bhavan, Chevayur, Kerala (CBSE) | 95.67% | 2018 |

EXPERIENCE

- Undergraduate Research | Unmanned Aerial Vehicles Lab | Prof. Sikha Hota** *August 2024 - Present*
 - Implemented Biased PNG, Two-Stage PNG, and Time-to-go Polynomial Guidance laws for 2D missile interception scenarios
 - Affirmed that the guidance algorithms achieved desired impact angles while satisfying acceleration and FOV constraints
 - Adopted multi-planar guidance laws for 3D interception and working to eliminate lateral acceleration profile discontinuities
- Research Intern | RWR&DC | Hindustan Aeronautics Ltd** *May 2024 - July 2024*
 - Analyzed, in-depth, the AFCS (Automatic Flight Control System) and actuator mechanisms of a semi-autonomous helicopter
 - Integrated Pitt-Peters dynamic inflow model into the helicopter dynamics simulator to improve transient response predictions
 - Validated simulation results against flight test data, for collective dump input, identifying areas for future developments
- Summer Intern | Aircraft Division | Hindustan Aeronautics Ltd** *June 2023*
 - Gained hands-on exposure to processes from machining to final assembly of various Hawk, Jaguar, and LCA Tejas aircrafts
 - Acquired in-depth knowledge of system integration through immersive training in aircraft hangars and production facilities

PROJECTS

- Aerial 2D Mapping and Estimation of Forest Area Cover | Prof. Sandeep Saha** *Jan 2024 - Apr 2024*
 - Constructed orthorectified 2D maps from aerial images, having GPS and altitude data, by stitching using Pix4Dmapper
 - Enhanced the map resolution using EDSR and estimated average forest canopy height for sample data by creating a DSM
 - Automated forest cover estimation using a U-Net CNN model trained on labeled aerial imagery and diverse public datasets
- CFD Analysis of Sports Ball Aerodynamics | Prof. Sunil Manohar Dash** *Jan 2024 - Apr 2024*
 - Simulated flow around golf ball & basketball (with & without spin) in ANSYS Fluent and analyzed aerodynamic coefficients
 - Investigated dimple effects on golf ball aerodynamics by varying size parameters and Magnus effect on basketball's trajectory
- Design and Analysis of a Quad-Wing Flapping Prototype | Prof. Sandeep Saha** *Aug 2023 - Nov 2023*
 - Designed and built a dragonfly-inspired quad-wing flapping prototype with a gear-slider mechanism for variable wing phase
 - Integrated a passive joint to allow wing rotation for realistic lift generation and conducted smoke visualization experiments
 - Gauged force changes with varied wing beat frequencies and front-wing-hind-wing phase differences, using precision sensor
 - Analyzed spanwise and chordwise wing flexibility effects on lift using 3 different wing materials, utilizing a high-speed camera
- Aerial Carbon Emission Monitoring System | Prof. Srinibas Karmakar** *Aug 2023 - Nov 2023*
 - Designed a drone-deployed module equipped with MQ7 and MQ135 sensors and measured CO and CO2 emissions real-time
 - Developed a method for ascent time calculations, intended for a helium-balloon-lifted setup, adopting an atmospheric model
 - Administered an altitude tracking system using BMP280 sensor data and employed nRF24L01 modules for data transmission
- Qualitative study on Worthington Jets | Prof. Sandeep Saha** *Mar 2023 - Apr 2023*
 - Experimentally investigated the effects of hydrophobicity, impact velocity, and sphere size on Worthington jet characteristics
 - Captured high-frame-rate video recordings to observe the surface closure phenomenon and recreated the Manu bomb effect
- Smart Irrigation System | Prof. Manjunatha Mahadevappa** *Feb 2022 - Mar 2022*
 - Implemented an automated irrigation system, using Arduino, optimizing water usage based on soil moisture and temperature
 - Integrated and calibrated moisture sensor, LM35 and a water pump, and developed embedded software to control irrigation

TECHNICAL SKILLS

- Languages:** Python | C | MATLAB | Arduino | Visual Basic | LaTeX
- Software:** MATLAB/Simulink | Ansys Fluent | Fusion 360 | Pix4Dmapper | Photoshop | Premiere Pro

RELEVANT COURSEWORK

Automatic Control of Aircraft | Flight Stability and Control | Introduction to Flight Vehicle Controls | Mechanics of Flight
Embedded Control Systems | Systems Laboratory | Introduction to Helicopter Engineering | Dynamics for Aerospace Engineers

ACHIEVEMENTS AND EXTRA-CURRICULARS

- AIR 5855 (top 0.55%) in JEE Advanced, AIR 8532 (top 0.8%) in JEE Mains, Rank 28 (out of 70000) in KEAM,** *2021*