



Aswin D Menon

Bachelor of Technology | Aerospace Engineering
Indian Institute of Technology, Kharagpur



aswin-d-memon.github.io

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

- AIR 5855** (top **0.55%**) in **JEE Advanced** | **AIR 8532** (top **0.8%**) in **JEE Mains** | **Rank 28** (out of **70000**) in **KEAM** (2021)
- Awarded departmental transfer to Aerospace Engineering based on a strong freshman-year academic performance (2022)

EXTRA-CURRICULARS

- Won overall **gold** at the Inter IIT Cultural Meet, 2023; Secured **3rd** (2023) & **5th** (2024) for Inter-Hall Short Film Making
- Member of RadhaKrishnan Hall soccer team (2022 to present), qualifying for Inter-hall GC **quarterfinals** in 2023 & 2024