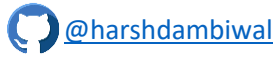


HARSH ASHISH DAMBIWAL

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PROJECTS

- ❖ **Bi-Directional Digital Twin of SCARA Robot** 2025 – Present
Built a real-time digital twin using ROS and NVIDIA Isaac Sim to mirror physical SCARA robot kinematics and dynamics. Implemented bidirectional communication between physical system and simulation. Integrated ESP32 telemetry with MATLAB monitoring and Python-based visual feedback for error correction.
Tools: ROS, Isaac Sim, MATLAB, Unity, Fusion360, NVIDIA Omniverse
- ❖ **VTOL UAV Design – SAE Drone Development Challenge** 2024 – 2025
Designed a two-motor VTOL UAV with robust aerodynamic design, safe vertical takeoff and landing, and 2 kg payload capacity. Conducted airfoil and wing performance analysis (Cl vs Cd, Cl/Cd vs AoA) using XFLR5 for UAV evaluation.
Tools: CAD, XFLR5, Fusion360
- ❖ **Improved Cold Storage System for Onion** 2025
Designed improved ventilation crate structure to reduce agricultural storage losses. Analyzed environmental parameters (temperature, humidity, airflow) and validated the model using ANSYS Workbench simulation.
- ❖ **Dye Sensitized Solar Cell Holder Design** 2024
Developed an adjustable DSSC holder enabling angular adjustment and optimal light alignment for solar cell performance experiments.

TECHNICAL LEADERSHIP & COMPETITION EXPERIENCE

- ❖ **Vice -Captain | Team Blitzkrieg | SAE DDC 2025-26** 2025 – 2026
Aero Club MITAOE
Led UAV team in SAE DDC Regular Category organized by SAE India. Contributed to aircraft design, airframe development, and flight testing. Achieved Overall AIR 1 in Regular Category at national level.
- ❖ **Aerodynamics Department | Team Ashwamedh | SAE DDC 2024-25** 2024 – 2025
Aero Club MITAOE
Performed complete airframe design and aerodynamic wing analysis for VTOL UAV. Conducted aircraft performance evaluation using XFLR5.

TECHNICAL SKILLS

- Aircraft Design & Aerodynamics: UAV Design, XFLR5, Flight Stability Concepts, Airfoil Analysis
- Simulation & Robotics: ROS (Basic), Gazebo, NVIDIA Isaac Sim, MATLAB (Basic), Unity
- CAD Tools: Fusion360, ANSYS Workbench, CURA
- Programming: Python
- UAV Flight & Control: RC Transmitter Operation, UAV Flight Simulation (RC Desk Pilot), ArduPilot/PX4 Flight Controller Configuration, Mission Planner

SOFT SKILLS

Languages: English (Professional), Hindi (Professional), Marathi (Native), Marwadi (Native) ● Strong communication, adaptability, and time management developed during internship. Collaborated with cross functional teams to deliver engineering solutions under deadlines.

EDUCATION

MIT Academy of Engineering, Pune
B.Tech Mechanical Engineering

2023 – 2027
CGPA: 6.5