RAHUL AYANAMPUDI

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EDUCATION

Texas A&M University, College of Engineering **College Station, TX**
B.S. in Aerospace Engineering with Honors and Thesis, Minors in Computer Science and Math *GPA: 3.95*
Awards: Craig and Galen Brown Foundation Scholar (valued at $60,000/year), Dean's Honor Roll May 2025
Programs: Grand Challenge Scholars Program, C3 Certificate, MSC Spencer Leadership Conference

EXPERIENCE

Collins Aerospace | Mission Systems Dallas, TX
Systems Engineering Intern – Modernization of the Mission System Aircraft Summer 2023 - Present
• Developed **full-stack** application to automate military requirement analysis eliminating ~93% of processing time.
• Applied MBSE to ensure security requirement compliance for an advanced USAF satellite communication network.
• Created 10 CAMEO SysML diagrams to decompose complex systems for the Survivable Airborne Operations Center.

Air Force Research Laboratory | Aerospace Directorate Dayton, OH
Aerospace Engineering Intern – Reusable Propulsion Scaling Study Summer 2022
• Optimized scramjet engine with 10x the mass flow of the X-15 to enable reusable intercontinental hypersonic aircraft.
• Increased **combustion** efficiency by ~12% by modifying fuel distribution, heat release profile, and cavity geometry.
• Refined complex computational models for quasi-1D flow physics to approximate experimental RC22 ground testing.

Air Force Research Laboratory | Aerospace Directorate Dayton, OH
Software Engineering Intern – Aerodynamic and Propulsion Sensitivity Study on Hypersonic Aircraft Summer 2021
• Analyzed design sensitivities for 8,000+ variations in vehicle geometries, viscous flow effects, and flight conditions.
• Generated low-fidelity **Python** tool to automate optimal aircraft configuration determination with ~20-minute runtime.
• Addressed material challenges related to the extreme aerodynamic loads and thermal heating of high-speed flight.

Air Force Research Laboratory | Sensors Directorate Dayton, OH
Mechanical Engineering Intern – DJI S1000 Octocopter Sensor Payload Development Summer 2020
• Designed and integrated an ultralight octocopter sensor payload using **Autodesk Inventor** and **FDM printing**.
• Reduced existing payload chassis mass by ~52% by performing topological optimization and **FEA** stress simulations.
• Configured ergonomic mount solution for next-generation antennae enabling 60° rotation for advanced target tracking.

EXTRACURRICULARS

Texas A&M Sounding Rocketry Team Dynamics & Propulsion Engineer August 2021 – Present
• Created 2D-MOC nozzle optimizer for 750-lbf thrust hybrid engine with **C++** and led supersonic wind tunnel testing.
• Simulated hybrid rocket performance with **6-DOF Monte Carlo MATLAB** script for trajectory analysis and recovery.
• Manufactured torsional rigidity measurement apparatus to characterize rocket fin aeroelasticity during flight to 30k-ft.

Aerospace Laser Optics Laboratory Undergraduate Researcher & Author January 2022 – Present
• Authored *LIDAR Measurement of Atmospheric Profiles with Atomic Cesium Vapor* and flight tested on a **NASA F-15**.
• Demonstrated extent of light scattering from laser propagation through turbulent atmospheric regions for **UAV** defense.
• Designed modular optical-access port extension using **SolidWorks** for the ACE Hypersonic Wind Tunnel to elongate laser focal length and enhance femtosecond laser electronic excitation and tagging (FLEET) flow diagnostic applications.

PROJECTS

High Power Rocketry | Dallas Association of Rocketry July 2023
• Built 7-ft dual-deploy fiberglass rocket, launched to 8,000 ft with an L-1350 solid motor, and recovered successfully.
• Utilized EggTimer Quantum and EggFinder Mini Transmitter onboard for real-time GPS tracking and altimeter data.
• Earned High Power Rocketry Level 1 and Level 2 Certifications from the National Association of Rocketry.

Flock | TAMUHack – 3rd Place Team for AA Challenge February 2023
• Developed responsive American Airlines airport social media app using **Node.js**, **React**, **HTML**, and **CSS** in 24 hours.
• Featured live flight tracking with **FlightAware API**, Reddit style forum, and passenger instant messaging system.

Drone Package Delivery | Engineering Design and Development May 2021
• Designed mid-size quadcopter modular package retainer to reduce shipping costs and expedite urban delivery services.
• Programmed in-flight navigation system, **Arduino** ultrasonic sensors, and Dijkstra's algorithm for route planning.

SKILLS

Python, C++, MATLAB, XFLR, STAR-CCM+, ANSYS, CAMEO, SolidWorks, Milling, RASAero, MultiSim, GitHub, Linux