

RAHUL AYANAMPUDI

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EDUCATION

Texas A&M University, College of Engineering

B.S. in Aerospace Engineering (Honors + Thesis), Minors in Computer Science, Math, and Entrepreneurship

College Station, TX

GPA: 3.91

Awards: Craig and Galen Brown Foundation Scholar (\$60k/year), TAMU Astronaut Scholar Nominee

May 2025

Programs: Grand Challenge Scholar, Aggies Invent, Greece Study Abroad, MSC Spencer Leadership Conference

EXPERIENCE

Axiom Space | Guidance, Navigation, and Controls

Houston, TX

GN&C Engineering Intern – Axiom Station Rendezvous Profile Design Software

Summer 2024

- Built 3-DOF rendezvous simulation with Clohessy-Wiltshire dynamics for ~15x faster runs than previous simulations.
- Implemented non-linear global optimization on the nominal burn profile to minimize ΔV saving up to ~\$35k per launch.
- Assessed 20 rendezvous and 5 re-rendezvous profiles with 1000+ Monte Carlo dispersions and ISS free-drift safety.
- Performed 100+ unit tests on linear differential correction guidance algorithms for single and multiple burn targeting.
- Facilitated integration of hardware-in-the-loop testing between star tracker and 6-DOF inertial rendezvous simulation.

Collins Aerospace | Mission Systems | Classified

Dallas, TX

AI/ML Engineering Intern – Modernization of the Mission System Aircraft

May 2023 – May 2024

- Developed full-stack application for military requirement analysis saving ~95% of processing time and ~\$100k annually.

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.

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.

Mechanical Engineering Intern – DJI S1000 Octocopter Sensor Payload Development

Summer 2020

- Designed and integrated an ultralight octocopter sensor payload for ~15% longer flights and advanced target tracking.
- Reduced existing payload chassis mass by ~52% by performing topological optimization and FEA stress simulations.

Aerospace Laser Optics Laboratory | Undergraduate Researcher & Author

January 2022 – Present

- Published thesis on [LIDAR Measurement of Atmospheric Profiles with a Multi-Prism Atomic Cesium Vapor Cell](#).
- Enhanced temperature profile measurements for boom propagation prediction and flight-tested system on a NASA F-15.
- Spatially separated particle and molecular scattering and improved resolution to observe ~10 MHz frequency shifts.
- Utilized hot-wire anemometry to characterize turbulence in the Subscale Atmospheric Facility crossflow and develop computational models for beam scattering through turbulent atmospheric environments for UAV defense applications.

Texas A&M Sounding Rocketry Team | GN&C & Propulsion Engineer

August 2021 – Present

- Created 2D-MOC nozzle optimizer for 750-lbf thrust hybrid engine with Python and led supersonic wind tunnel testing.
- Simulated hybrid rocket performance with 6-DOF Monte Carlo MATLAB script for trajectory analysis and recovery.
- Constructed 6-DOF model and PID controller for self-landing hopper vehicle with throttleable engine and RCS thrusters.
- Manufactured torsional rigidity measurement apparatus to characterize rocket fin aeroelasticity during flight to 30k-ft.
- Spaceport America 2024 10k COTS Solid (6th/68), Overall (10th/122), 1st in Texas, Technical Report/Onboard Video (1st).

PROJECTS

VTOL Quad-Biplane UAS | Office of Naval Research | Project Manager

August 2024 - Present

- Leading 20 engineers to build 40 lb. VTOL tactical resupply UAS with 8 lb. payload and 10-mile range in \$10k budget.
- Analyzing rotor/propeller and control effector performance and enabling autonomous GPS-based waypoint navigation.

TensiTech | Co-Founder | NSF I-Corps Site Fellow

January 2024 - Present

- Researching tensegrity structures for spacecraft mass minimization, dynamic deployment, and autonomous actuation.

High Power Rocketry | Dallas Association of Rocketry | NAR HPR L1 Certified

July 2023

- Built 7-ft dual-deploy fiberglass rocket, launched to 8,000 ft with an L-1350 solid motor, and recovered successfully.

Flock | TAMUHack | 3rd Place Team for American Airlines Challenge

February 2023

- Generated responsive American Airlines airport social media app using Node.js, React, HTML, and CSS in 24 hours.

SKILLS

Python, C++, MATLAB/Simulink, Java, Git, Jira, STAR-CCM+, PID, EKF, Pixhawk, SolidWorks, XFLR, RASAero, Linux