SIDDHARTH GOEL

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EDUCATION

Purdue University, West Lafayette, IN

Master of Science in Aeronautical and Astronautical Engineering — January 2025 - May 2026
Bachelor of Science in Aeronautical and Astronautical Engineering/ Minor in Computer Science: — August 2021 – December 2024
GPA: 3.82

Technical Skills**:** MATLAB, Simulink, Java, C, C++, Python, NX, Jira, Confluence, NX Siemens

Relevant Coursework**:**
AAE 567 - Intro to Kalman Filtering and state estimation ; AAE 568 - Applied optimal control and estimation, AAE 564 – System Synthesis and analysis, AAE 590 – Estimation and Control Lab, AAE 550 (Audit): Multi-Disciplinary Optimization

DESIGN EXPERIENCE

Co-Founder and President, GoAero Purdue, West Lafayette, Indiana — April 2024 – Present

- Founded BoilerAid to compete in the GoAero competition to develop a semi-autonomous search and rescue vehicle.
- Managed all aspects of the team spanning technical work, fundraising, faculty outreach, recruitment, and project management.
- Led the design process from initial conceptual design to critical design of an eVTOL vehicle that fits into the UAM ecosystem.
- Created a technical vehicle design proposal that won a US University Innovation award of over $28k supported by a NASA grant.
- Worked with PX4, cascaded controllers, and practical PID controller implementation and tuning.

Engineering Intern, Reworld Waste, Morristown, New Jersey — June 2024 - August 2024

- Initialized scope, requirements, and concept of operations of drone based NDT inspections of Reworld's energy generation facilities.
- Defined initial drone standards for drone usage at Reworld to comply with FAA Part 107 regulations, and internal safety standards.
- Developed a phased roll out plan to accommodate operational infrastructure.
- Organized drone demonstrations with vendors and manufacturers to provide proof of concept.
- Conducted an internal analysis to validate economic feasibility, technical capability, and operational requirements.

Personal Optimal Control and path planning problem portfolio — January 2024 - Present

- Developed optimal trajectory of non-linear quadcopter with slung load to minimize payload oscillation via indirect methods.
- Planned Earth-Mars constrained orbital transfer with mass considerations to solve minimum time, fuel, and energy problems.
- Used Convex Programming with lossless convexification techniques to generate an Martian lander path with glide slope constraints.
- Explored and implemented Model Predictive Control, Gauss Newton LQR, Convex Programming, and other optimal control solutions.

Purdue Space Program (PSP), Purdue University

Active Controls – Avionics Software Lead — August 2023 - January 2024

- Wrote testing and control scripts for various components and actuators in C++ for conducting system identification.
- Encoded state estimation algorithms using Encoders, IMU, GPS, and force transducers.
- Modelled Vehicle dynamics into Simulink to simulate various control architectures.

Active Controls- Structures Lead — August 2022 - August 2023

- Developed the structural architecture of an electric powered lander vehicle.
- Designed and manufactured a 3-D printed gimbal with 2 degrees of freedom for thrust vectoring.
- Optimized air intake design for the vehicle to improve thrust output.

Drone Design Intern at Redon Systems, Hyderabad, India — May 2023 - August 2023

- Wrote iterative sizing code for electric UAV's using MATLAB.
- Worked on the preliminary design of a barrel launched electrically powered UAV using NX and XFLR-5.
- Simulated flight control law in Python via gazebo in Linux.

RESEARCH EXPERIENCE: 190+ credited research hours

Graduate Research Assistant, Automation and Optimization Lab (AOL), Purdue University – Dr Ran Dai — January 2025 – Present

- Conducted a literature review on vision based estimation of center of mass, and moment of inertia ratios of space objects.
- Explored various attitude prediction and measurement strategies formulated as Extended Kalman Filters and Least Squares problems.
- Formulated a framework for capturing fast spinning objects in space such as asteroids, space debris, and satellites via a robotic arm.

Research Assistant, VRSS labs, Purdue University – Dr Karen Marais — August 2023 – August 2024

- Developed an accident analysis framework for establishing safety standards in construction in space using Java.
- Analyzed disasters using FLAPP framework to capture inter-player interactions, pathogen propagation, and system failure.
- Designed an app to autonomously create the analysis graphics using analysis tables and user provided data.

AWARDS AND HONORS

- Honors: Dean's List and Semester Honors- All semesters (Fall 2021 – Fall 2024)
- AAE Undergraduate General Scholarship Recipient (Fall 2024)

AFFILIATIONS - Honors Society for Aeronautical and Astronautical Engineers – Sigma Gamma Tau (SGT) — August 2022 - Present