

MARK PARAL

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PERSONAL STATEMENT:

Aeronautical and Astronautical Engineering Master's student seeking exciting opportunities in the aerospace sector.

EDUCATION:

Stanford University – Stanford, CA

Expected Graduation: 2025

Master of Science in Aeronautics and Astronautics

GPA: 3.9/4.0

Purdue University – West Lafayette, IN

Graduated with Distinction: May 2023

Bachelor of Science in Aeronautical and Astronautical Engineering

GPA: 3.9/4.0

Certificate in Entrepreneurship and Innovation

Relevant Coursework:

- Learning Based and Optimal Control – Convex Optimization – Spacecraft Attitude Dynamics – Trajectory Optimization – Robot Autonomy – Kalman Filtering

EXPERIENCE:

Flight Dynamics Intern – Lynk Global – Falls Church, VA

June 2024 – Sept 2024

- Led development of a new state estimation architecture, applicable to both on-ground and in-orbit operations
- Implemented a high-fidelity propagator to improve state estimation accuracy and prediction of future trajectories
- Engineered post processing algorithms for precise state estimation and orbit determination

Engineering Intern – Lynk Global – Falls Church, VA

May 2023 – Aug 2023

- Assembled hardware-in-the-loop (HWIL) setup for novel direct-to-phone satellites
- Developed and adapted software for handling CAN network interfaces between sensors, actuators, and dynamics simulator in C
- Built sensor simulators using microcontrollers
- Automated reaction wheel qualification testing

Undergraduate Research Assistant – Dr. Steven Son's Group – Zucrow Laboratories, IN

Aug 2022 – May 2023

- Author on "The effect of porosity on flexoelectricity in 3D printed aluminum/polyvinylidene fluoride composites" published in the Journal of Applied Physics and "The Effect of Porosity on Flexoelectricity in Fluoropolymer/Aluminum Films" 13th U. S. National Combustion Meeting Conference Paper
- Operated test setups experimentally measuring the flexoelectric coefficient of a variety of materials
- Fabricated 3D-printed energetic test samples
- Reviewed published literature on flexoelectricity and its applications to energetic materials
- Performed t-test analytics on resulting data to determine the significance of results

Avionics Hardware Intern – Blue Origin – Seattle, WA

May 2022 – Aug 2022

- Developed novel solution to enhance and expand sensor infrastructure on the New Shepard Propulsion Module
- Designed custom PCBs for signal conditioning and power distribution on the New Shepard launch vehicle
- Performed audit of New Shepard crew capsule sensors
- Wrote engineering work orders to resolve non-conformance reports

Avionics Intern – Firefly Aerospace – Austin, TX

Jan 2022 – May 2022

- Developed custom hardware and software solution to automate qualification process for harnessing on all vehicles
- Constructed payload wiring diagrams for the Alpha launch vehicle in Siemens Capital software
- Created and led a test campaign to qualify securing devices used on multiple spacecraft
- Built custom Python executables to allow for quick updates to components in Siemens Capital software

Undergraduate Research Assistant – Dr. Steven Son’s Group – Zucrow Laboratories, IN May 2021 – Dec 2021

- Author on “Piezo-Energetic Composite Film Fabrication and Poling Process for Pressure Sensor Applications” International Pyrotechnics Society Seminar Conference Paper
- Participant in Advancing Army Modernization Priorities Undergraduate Program May 2021 – Aug 2021
- Fabricated test setups to examine the properties and limitations of piezoelectric energetic gauges
- Designed and performed tests to determine the potential applications of shape memory alloys in the energetics field
- Reviewed published literature on topics such as the impact sensitivity of piezoelectric energetic materials

Avionics Lead – Purdue Space Program – West Lafayette, IN Dec 2020 – Oct 2021

- Team member since August 2019, Avionics Lead for Solids team December 2020 – August 2021, Avionics Lead for High Altitude team May 2021 – October 2021
- Investigated avionics solutions for a two-stage separation and ignition system to fly within a rocket designed to reach the Kármán line
- Designed, routed, and manufactured custom flight computers to control staging, ignition, and recovery operations
- Developed data acquisition and storage software for a custom flight computer
- Mixed propellant grains with the propulsion team for a custom class O rocket motor

TECHNICAL SKILLS:

- MATLAB – Python – C/C++ – CATIA – EAGLE – SolidWorks – PCB Design – Altium – Simulink – Capital – NX – OrCAD – Level 2 High Powered Rocketry – Linux – Amateur Radio Technician – Soldering – ROS2

ACTIVITIES AND ACHIEVEMENTS:

- 2023 Matthew Isakowitz Fellow
- Recipient of the Joe Melroy Umbreit Scholarship 2020 – 2021
- Recipient of a Purdue AAE Undergraduate General Scholarship 2022 – 2023
- Winner of the 2021 Purdue AAE 251 Northrop Grumman Rocket Design Contest
- Dean’s List and Semester Honors 2019, 2020, 2021, 2022, and 2023 from Purdue University