Michael Ferrell

Los Angeles, CA
949-344-5277 | michaelrferrell03@gmail.com | michaelrferrell.github.io | linkedin.com/in/michaelferrell03

Education

University of California, Los Angeles Sept 2022 - June 2026
BS, Aerospace Engineering GPA: 3.75
UCLA Alumni Scholar

Experience

Rocket Project at UCLA

Ground Systems Lead Engineer July 2023 - Present

- Led and directed a dynamic team of 5 student engineers in the comprehensive design of ground electronics systems tailored for a LOx/Ethanol liquid bipropellant rocket.
- Designed and manufactured the Data Acquisition (DAQ) subsystem which captures real-time fill, pressure, temperature, and thrust data. This information is seamlessly uploaded to a local server and safeguarded through microSD card backups, showcasing a commitment to data integrity and accessibility.
- Developed Printed Circuit Boards (PCBs) that interface with load cells, thermocouples, and pressure transducers. Utilized decoupling capacitors and op amps to mitigate noise and ensure clean data.
- Programmed microcontrollers embedded within each PCB to orchestrate the reception of data from the ADCs and simultaneously store the data onto microSD cards and transmit the data to a Raspberry Pi to be uploaded to the local server.
- Designed and constructed the Controls subsystem which executes commands to actuate solenoid valves and ignite e-matches, thereby performing critical fill, launch, and abort procedures.
- Innovated a PCB integrating optocouplers to validate solenoid states at the launch pad, effectively converting 24V signals to 5V for streamlined processing and transmission by the board's microcontroller.
- Implemented a failsafe auto-abort feature, programming the system to promptly safe-state each solenoid if communication between the launch pad and bunker is lost for over 30 seconds.
- Oversaw rigorous testing of the Controls and Switchbox subsystems, ensuring consistent communication and reliable control of the Propulsion team's systems during extended operational durations.

Avionics Engineer Jan 2023 - June 2023

- Contributed to the construction of an advanced avionics system housed inside the nose cone that delivered real-time GPS, altitude, temperature, and acceleration data.
- Orchestrated the design and assembly of a space-efficient, low-power PCB dedicated to in-flight data collection and seamless transmission using LoRa technology.
- Innovatively implemented a power conservation strategy by integrating a pull-pin switch within the nose cone, which enabled the convenient activation and deactivation of the avionics system post-integration.
- Wrote the transmission code of the main microcontroller, solving an interference issue between the GPS and transceiver by programming them to operate in offsetting intervals.
- Executed comprehensive testing to validate sensor readings, ascertain LoRa transmission range in noisy environments, and evaluate battery efficiency.

Skills

Design & Manufacturing

- SolidWorks to design parts for 3D printing.
- Autodesk Eagle and Fusion 360 to design electrical schematics and PCBs.
- PCB assembly involving SMD components.
- Manual lathe and mill.

Programming

- C++ and Java for large scale program development utilizing data structures and algorithms.
- Python for simulations and data analysis of propulsion tests and flight data.
- MATLAB for modeling and simulation of a variety of model rocket designs.