NATHANIEL KALANTAR

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EDUCATION

University of Michigan Ann Arbor, MI
M.S.E. Electrical & Computer Engineering *December 2024*
B.S.E. Electrical Engineering (GPA: 3.83/4.00) *December 2023*
Relevant Coursework: Power Electronics, Embedded Systems, Analog Circuits, Electromagnetics, Control Systems, DSP

WORK EXPERIENCE

Impulse Space Redondo Beach, CA
Embedded Software Intern *May 2023 – August 2023*

- Improved in-flight valve fault detection by implementing overcurrent trip, open circuit, and poppet pullin detection
- Calibrated thermocouples and RTDs in the spacecraft's engine controller software with lookup tables generated in Python, according to onboard amplifier circuits and NIST/ITS-90 standard calibration equations

SpaceX Cape Canaveral, FL
Launch Intern, Falcon Pad Engineering *September 2022 – December 2022*

- Reduced launch turnaround time by reworking umbilical cable routing and mounting in the Falcon 9 launch mount
- Debugged launch pad hardware and data acquisition system anomalies to support refurbishment between launches, including PTC fuses, load cell test devices, load pins, solenoid valves, and 4-20mA sensors

Ursa Major Technologies Lafayette, CO
Avionics Intern *May 2022 – August 2022*

- Automated engine controller acceptance tests with a 10-layer PCB that simulates open and short circuits conditions in harnessing for 4 BLDC motors, 8 limit switches, 12 Hall effect sensors, and 4 resolvers

PROJECTS

Switching Converter PCB: Power Electronics Course Project *September 2023 – November 2023*

- Developing a two-stage switching converter in Altium to drive a 1A load with variable input voltage and transients
- Analyzing performance of a closed-loop buck converter controller and a feedforward boost converter controller

RFID Reader PCB: Senior Capstone Project *September 2023 – November 2023*

- Sized matching networks on a PCB in Altium to interface an RFID transceiver IC to 12 multiplexed HF antennas

U of M Rocketry Team: Michigan Aeronautical Science Association Ann Arbor, MI
DAQ Design Project *May 2022 – April 2023*

- Designed schematics in Altium for a mixed-signal analog input PCB capable of reading 18 voltage sense channels at 1 kHz and transmitting data to onboard memory and over a parallel-terminated LVDS serial backplane interface
- Implemented overvoltage protection and filter circuits with less than 100nA of leakage current on user-facing inputs

Avionics Lead *September 2021 – April 2022*

- Led a team of 15 students to develop a data and controls system to fire a liquid rocket engine, supporting 17 solenoid valves, 23 pressure transducers, 9 thermocouples, 2 stepper motors, 2 potentiometers, and 3 load cells
- Resolved instrumentation and power issues in the field during fast-paced liquid engine test campaigns
- Verified build quality and hardware functionality on an engine controller PCB that successfully launched in May 2023
- Programmed engine controller in C to perform active tank pressure control and remote valve actuations

SKILLS

Electrical Engineering: Altium, KiCad, LTSpice, PCB Design, Switching Converters, Microcontrollers, Instrumentation
Electrical Hardware: Oscilloscopes, Function Generators, DMM, Power Supplies, Soldering, Rework, Harnessing
Programming: Python, C, C++, Matlab, Simulink, LabVIEW (basic), Verilog (basic)