

Education

Massachusetts Institute of Technology

M.S. Control Systems (in progress)
Ph.D specialty in Power Electronics (in progress)

September 2022 - Present

University of California, Santa Barbara

B.S. Electrical Engineering

September 2017 - June 2021

Research

High Voltage Power Converter for EAD aircraft

September 2022 - Present

- Designing high voltage DC-DC power converter to help enable 10+ minute flight time of EAD aircraft

Work Experience

Rotor Technologies

Embedded Engineer

October 2021 - October 2022

- Worked on high performance distributed computing system for remotely piloted helicopters
- Helped architect onboard communication & control infrastructure, optimizing for latency, robustness, and scalability
- Collaborated on development of C++ drivers for various embedded functions, including ADC, UART, SPI, and CAN
- Primary author of non-blocking ADC SPI driver

Tesla

Thermal Integration Intern

June 2020 - September 2020

- Built up software infrastructure for automated testing of Tesla Semi thermal systems, preventing 1yr delay
- Designed component level tests (fans, compressors, pumps) to prepare for more complex tests
- Utilized Jenkins for test automation, CAN+UDS comms protocols, and internal OOP python test frameworks

CTRL-labs (now Facebook Reality Labs)

Hardware Engineering Intern

June 2019 - September 2019

- Worked on analog front-end(AFE) of electromyography armband that converts motor neuron spikes to hand gestures
- Proposed & executed AFE amplifier biasing changes, resulting in 1/3 space & power reductions
- Investigated effect of oversampling on spike waveforms, caught and helped resolve very deep bug in SPI driver

Project Experience

Ionic Skies - see ionicskies.com

Team Lead

March 2020 - June 2021

- Started and led 14 person interdisciplinary senior capstone team to build first ever fully controllable ionic wind aircraft
- Validated active control of aircraft in glide tests, functional control surfaces when thrusters on, and power converter driving ionic thrusters that generated 120g (60%) thrust at 34kV
- But, ran out of time before we could fly the airplane
- Led design and development of thrusters and power converter, managed integration with airframe and launcher
- Owner of DC-DC power converter development - 3 stage inverter, transformer, multiplier circuit that successfully converts 180Vin to 40kVout, 550W, and 78% efficiency
- Team won \$6000 grand prize for best multidisciplinary capstone project
- Presented work in October '21 to Prof. Steven Barrett & Lab for Aviation and the Environment

Ball Balancing Robot (BB-9) - see mihir.space

Personal Project

2019 - 2020

- Designed & built robot that balances on a single spherical wheel
- Utilized simple control system based on complimentary filtering of IMU, then linear PID control in 3 axes
- Explored state representation in various coordinate systems, Kalman filtering, and writing embedded drivers

Other Activities

New Venture Competition - Solaris

October 2020 - May 2021

Team Lead ("CEO")

- Stared Solaris as a sister project to Ionic Skies, inspired by Solar Impulse and atklantiksolar
- Idea: fixed wing solar drone flies for days and nights without landing, collects high res data of farms, generates agricultural insights
- Team performed extensive customer discovery, meeting with farmers from Santa Barbara and Santa Maria regions
- Made NVC finals (top 5 out of ~40 teams), won honorable mention and \$2500
- Did not go through with idea after realizing lack of competitiveness with drone-in-a-box systems

ECE 5 - Learning Assistant

January - March, 2020 and 2021

- Helped teach basic electronics concepts (microcontroller programming, communication protocols, resistive networks, bench equipment) to EE freshmen
- Assisted students in prototyping their Arduino projects

Skills & Coursework

Graduate Coursework

- Solid State Circuits
- Visual Navigation for Autonomous Vehicles
- Power Electronics
- Underactuated Robotics
- Linear Systems

Skills

- Languages: C++, Python, Matlab
- Tools (Software): Vim, Bash, Git
- Tools (Hardware): Kicad, Solidworks