NICHOLAS PAIVA

nick-paiva.com
nick.paiva.work@gmail.com
Pittsburgh, PA

Education

2016 – Dec. 2019

Carnegie Mellon University • Pittsburgh, PA • 3.92 GPA

Bachelor of Science in Electrical and Computer Engineering, Dean's List

Work Experience

2022- Present

Senior Electrical and Computer Engineer • HEBI Robotics • Pittsburgh, PA

- Worked with vendors to design a custom 10S Lithium-Ion Battery for robotics applications
- Designed an open-source Battery Interface Board to provide a bridge from the battery charge tracking IC to CAN, and an additional board to provide CAN to Ethernet conversion
- Maintained and managed large quantity production of core product PCBAs
- Developed web interface enabled automated test fixtures for core products using Python
- Worked closely with Mechanical Engineers to develop size-constrained PCBAs for new products, including a high power custom harmonic-drive based actuator
- Responsible for ensuring Electromagnetic Compliance (FCC, CE-EMC, MIL-STD 461) of products
- Performed Pre-Compliance EMC testing using low-cost tools
- Soldering, Rework, and Hand assembly of PCBA prototypes
- Used WSL and OpenOCD to set up a toolchain for ARM firmware debugging and development
- Subject matter expert for Electrical Engineering and Low-Level Firmware development

2021-2022

Electrical and Computer Engineer • HEBI Robotics • Pittsburgh, PA

- Designed custom power and Ethernet electronics for space-constrained robotics applications
- Managed builds and testing of PCBAs in medium to large production runs
- Designed, manufactured, programmed, and tested an Ethernet controlled FOC Motor Controller with 1kW peak output and 33kHz control loop on an STM32F7 microcontroller running an RTOS
- Responsible for the development of low-level firmware drivers for new sensors and peripherals

2019- 2021

Engineer • Carnegie Mellon Biorobotics Lab • Pittsburgh, PA

- Wrote firmware and designed electronics for 2 meter tall and hyper-modular robots
- Developed a small form factor 12S BMS and soft-start boards for a distributed power system
- Designed custom electromagnetic coil for novel elastomer-based force/torque sensor
- Lead electrical designer for an underwater snake robot
- Created Qt-based software interface and continuous integration tools using GitHub Actions for robotic systems
- Designed a water-proofed control case for a snake robot

2017- 2019 Research Assistant • Carnegie Mellon Biorobotics Lab • Pittsburgh, PA

• Designed a miniaturized platform with an under 1 square inch footprint and wide input power supply for edge computing, analog sensing, and inertial measurement

• Evaluated and supported the development of several state of the art sensing technologies

Fall 2019 Teaching Assistant • Carnegie Mellon University • Pittsburgh, PA

• Supported a course on the theoretical background and practical application of robot kinematics and dynamics

Summer 2019 Electrical Engineering Intern • HEBI Robotics • Pittsburgh, PA

• Developed a modular power controller to manage power requirements of robotic systems

• Designed a configurable test bench to assess the robustness and efficiency of DC/DC regulators

2016-2019 System Lead • Carnegie Mellon Racing • Pittsburgh, PA

• Worked on a team to create an award winning Formula 1 Electric race car

• Designed, documented, and routed the wiring harness for the car

Summer 2018 Electrical Engineering Intern • Deeplocal • Sharpsburg, PA

• Optimized firmware for a Cypress PSoC to control 300 LEDs, 6 motors, and sensors from a single low-cost chip

• Selected and tested motors and motor controllers based on torque and speed requirements

Skills

PCB and Hardware Design	Altium Designer • PSoC Creator • SystemVerilog • LTSpice
Electronics Manufacturing	Soldering • Reflow • PCB Rework • Automated Test Fixtures
Firmware Development	STM32 • ARM • ChibiOS (RTOS) • SPI • I2C • UART • Ethernet
Circuit Design	Power Electronics • Embedded Computing • Analog Design
Programming	C++ • C • Python • x86 Assembly • MATLAB • LaTeX • Java • ROS
Fabrication and Prototyping	Fusion 360 • Laser Cutting • 3D Printing • Carpentry