Robby Nelson

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Georgia Institute of Technology

Objective

Multidisciplinary thinker in GT ECE looking for internships in Summer 2021. Interested in Embedded/Low Level Software, Quantum Computing, Controls, and ML/AI. Loves working with Computing and Autonomous systems and has consistently jumped headfirst into projects outside of immediate areas of expertise.

Education

Georgia Institute of Technology, B.S. Electrical Engineering (GPA: 3.73) *Class of 2022*

- Relevant Courses: Programming HW Systems, State Space Controls, Analog Circuits, Quantum Mechanics, Microelectronics, DSP, Feedback Controls, Digital Design, Electromagnetics
- Enrolled in Computer Science Minor with courses in OOP, Data Structures, AI/ML, Engineering Computation

Work Experience

Tesla Motors, Vehicle Software Intern *May 2020 – August 2020*

- Created a hardware and software setup to validate audio functionality of the Tesla Premium Audio Amplifier. Wrote Python code that utilized Fast Fourier Transforms and Unix audio utilities to send signals on car audio channels and integrated it with a large internal automation library. Created a hardware configuration with Multiplexers, Transformers, and other components to select the correct audio channel.
- Worked to create key components for an outdated Python library to simulate touch commands on the Tesla Model S and Model 3 Center Displays, enabling engineers to quickly develop new Firmware and validate legally required capabilities such as the emergency call button. Utilized several proprietary libraries for interacting with the vehicle.
- Wrote software to identify critical firmware bugs including backup camera failures and incorrect vehicle process restarts
- Vastly improved and modernized the Tesla Firmware test automation by migrating 15 Jenkins Jobs and physical hardware Nodes to a new server. Set up a Docker environment with ported networking in order to streamline common job nodes and improve debugging. Modified existing software architecture for a distributed systems approach.

NCR Corporation, Software & Electrical Intern *May 2019 – August 2019*

- Designed and built robotic device and 2 layer PCB using Cadence Allegro to automate EMV capable payment terminal
- Implemented remote controlled test harness using Raspberry Pi, Python, and Bottle
- Developed automated performance testing framework for payment devices using Python, threading module, and Pytest, extending and leveraging several large, pre-existing codebases
- Reduced performance testing costs through automation, with an expected savings of thousands of dollars over a two year period

Activities and Research

Georgia Tech Systems Research Lab *January 2019 – Present*

- Co-Author on a paper pending submission to the American Control Conference.
- Working as an undergraduate researcher on a swarm robotics localized tracking project that uses multiple robots and derivative free calculation methods to follow a malicious agent through an environment. Led project to create MATLAB code to track a moving agent using the Speed-Up-Slow-Down strategy by reading multiple journal papers in theoretical controls. Submitted and successfully ran code on the Georgia Tech Robotarium robots.
- Worked to implement MATLAB code for multi-agent 2D Control Theory source seeking algorithms on physical GT-MAB blimps using Xbee modules and OptiTrack cameras.
- Designed software functions for plotting blimp waypoints and scaling them to a more reliable interval

GT Solar Racing *January 2019 – May 2019, August 2020 – Present*

- Member of Batteries / Battery Management sub team
- Working on C/C++ microcontroller project to reduce time to detect failures in battery monitoring electronics

Georgia Tech ECE Hive Makerspace *May 2019 - Present*

- Peer Instructor: Embedded Systems Specialization
- Facilitated the creation of multidisciplinary student projects using electronics equipment and manufacturing tools

Yellow Jacket Space Program *August 2019 – May 2020*

- Worked on a C/C++ data logging solution with Teensy microcontroller and SD protocol to facilitate reliable storage of mission critical data. Headed preliminary design research for the power module subsystem

Applicable Skills

Languages: C++/C, Python, MATLAB, VHDL/Verilog (learning), Assembly, Bash, Java

Software: Git, UNIX Systems, SPICE, Jenkins, Android Studio, Cadence Allegro, Autodesk Inventor

Hardware: PCB Design, DSP, Digital Design, Analog Circuitry, Raspberry Pi, Arduino, ARM Mbed, Oscilloscopes/Benchtop Tools, Surface Mount Soldering, TI Launchpad