

Education

Rochester Institute of Technology

BS Electrical Engineering, December 2020

St. Edwards High School

Pre-Engineering, May 2015

Engineering Experience

CPR Tools

March 2021 - September 2021

Electrical Engineer

Fort Myers, FL

- **Circuit Design:** Used Cadence EDA and spice simulations to design DC-DC switch mode power supplies. Designed a mixed-signal circuit that contained a microcontroller, DAC and a current feedback amplifier which was used to control a linear voice coil motor.
- **PCB Design:** Designed multilayer PCBs for manufacture. Performed PCB routing for high speed signals. Sourced vendors and parts.
- **Brushless DC Motor Control:** Researched and designed methods for controlling brushless DC motors with an arm microcontroller.
- **Xilinx FPGA:** Wrote VHDL code for an FPGA in order to investigate ways to implement servo feedback control for hard drive heads.
- **ARM Emulation:** Investigated ways to emulate ARMv7 bootloader/binaries using QEMU. Disassembled binaries with IDA Pro.
- **Reverse Engineering:** Used logic analyzers to reverse engineer SPI and I²C protocols. Wrote C++ code to mimic protocols.

LEA Professional

December 2019 - January 2020

Electrical Engineering Co-op

South Bend, IN

- **PCB Assembly:** Used hand soldering skills to populate PCBs and assembled test equipment for a power amplifier startup.

McIntosh Labs

June 2019 - August 2019

Electrical Engineering Co-op

Binghamton, NY

- **Analog Circuit Design:** Designed a circuit that effectively removed DC offset present in dirty AC wall power in order to reduce unwanted humming from transformers. Performed testing to ensure circuit was safely designed. This circuit was implemented into McIntosh Amplifiers.
- **Product Design:** Worked with a group of co-op's to design a McIntosh branded power cycler for automated validation testing. Developed a Javascript web based interface that was hosted on an embedded Linux computer and wrote C code to interface with embedded hardware.
- **EM & ESD Validation Testing:** Assisted in running EMC immunity and emissions tests on products in an EMC chamber. Performed ESD testing on products. Learned about ways to mitigate EMC and ESD related problems.
- **Reverse Engineering:** Investigated ways to bypass DRM present printer ink cartridges. Was able to emulate EEPROM chips with an Arduino microcontroller.

Crown Audio / Harman

December 2016 - June 2017, August 2017 - December 2017

Electrical Engineering Co-op

Elkhart, IN

- **Validation Test Automation:** Developed tools and techniques to automate validation tests for high power professional amplifiers. Wrote C# applications that interfaced with lab equipment over serial, GBIP, USB, and Ethernet that were successful in running both power cycle and power output validation tests.
- **Circuit Analysis / PCB Rework:** Performed trouble shooting of amplifier prototypes using circuit analysis techniques then repaired or made modifications to the PCBs by performing SMD rework. Quickly developed the soldering skills to work with 0201 sized parts as well as replacing quad row packaged parts.
- **Circuit Design:** Designed, sourced parts, laid out, and assembled a circuit that was used to speed up the runtime of a validation test. The circuit sensed the AC current draw of a unit; when no current was detected it would then short the rails of an amplifier to drain the its bulk capacitance.
- **PCB Layout:** Responsible for designing a high precision audio filter PCB. Performed parts selection and used Mentor Graphics EDA to layout circuit board.

Confidential

June 2017 - August 2017, April 2019 - December 2020

Software Developer

Portland, OR

- **MATLAB Programming:** Improved the code base of a MATLAB engineering tool that used IoT sensors to analyze real time data.

Clubs

- **Space Exploration:** Served as leader of the power subsystem for RIT's Space Exploration Club's Cube Satellite launch initiative (CSLI). Performed risk assessment and power budgeting. Authored a launch proposal that was submitted to NASA.

Skills and Knowledge

- **Programming:** C, C++, C#, ARMv7 assembly, MSP430 assembly, Python, MATLAB, L^AT_EX, git, bash scripting, Tensorflow, Verilog, VHDL
- **Electronics:** SMD soldering, PCB design experience, IC design experience, DC-DC converter design, Software Defined Radios
- **Software:** Cadence Virtuoso, Cadence Allegro, Altium, Mentor PCB, KiCad, Pspice, Creo/ProE, Xilinx, IDA, cmake, gdb
- **Computers:** Linux/GNU, Microkernel (L4Linux), Virtualization (Xen and KVM), QEMU, Networking, LUKS disk encryption

Projects and Hobbies

- **AI Audio Mixing:** Experimented with machine learning models using Tensorflow Keras to automate live audio mixing.
- **Servo Controlled Subwoofer:** Designed a subwoofer and a PID controller that would correct error in the cone's position.
- **IC Design:** Designed a half adder that was etched on a silicon wafer. Designed and simulated opamps in Cadence Virtuoso.
- **Wireless Magstripe Card:** Designed a PCB that can wirelessly emulate magstripe ID cards. Had a LiPo battery charger.
- **Drum Set Lighting:** Created sound activated drum lights using an Atmega328 micro, LED's, and piezoelectric sensors.
- **Virtualization:** PC uses a hypervisor and VMs for security.
- **Senior Design - 3D Bioprinter:** Designed the optics and power supply for curing hydrogel with UV light.
- **Software Defined Radio:** Built a SDR amateur radio setup.
- **Capture the flag:** Enjoys CTF games such as microcorruption.