

Ryan Smith

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EDUCATION

Binghamton University, State University of New York, Thomas J. Watson College of Engineering

Bachelor of Science in Computer Engineering

Conferred May 2020

- Major GPA: 3.7/4.0 | Cum Laude | Dean's List
- New York State STEM Scholarship Recipient
- Tau Beta Pi Engineering Honor Society

Master of Science in Electrical & Computer Engineering

Conferred May 2021

- GPA: 4.0/4.0 with dual concentrations in Computer Architecture & Networks and Power & Energy

TECHNICAL SKILLS

- **Familiar Software:** Xilinx ISE, MPLAB, Atmel Studio, Simplicity Studio, Altium Designer, Matlab, LT Spice, SIMetrix, SIMPLIS, Git, Spyder, Microsoft Visual Studio
- **Languages/Architectures:** VHDL, C/C++, Python, Perl, Bash scripting, AVR, PIC, ARM
- **Operating Systems:** Mac, Windows, Linux, FreeRTOS
- **Embedded Hardware:** Xilinx Spartan 6, Atmel SAM/AVR, PIC8/16/32, Silicon Labs EFM8/EFM32, Cypress PSOC, Raspberry Pi

PROFESSIONAL EXPERIENCE

Engineer II, Test Development Group, Microchip Technology Inc.

Jun. 2021- Present

- Working within the USB & Networking Group supporting system level test (SLT) development efforts within a semiconductor Automated Test Equipment (ATE) production test environment
- Leading the initiative to bring R&D surrounding SLT development to the New York office by establishing a lab bench setup and creating software utilities for local debug and bring up of new product SLT testing
- Developing embedded firmware for an Arm Cortex A5 microprocessor-based system on modules (SOM) and device under test (DUT) devices featuring a SAMV71 ARM Cortex M7 CPU core
- Provide SLT support to test engineering team through bench correlation experiments, hardware module debug, firmware improvements, and software automation utilities when necessary

Electrical Engineer, Research & Development, ALA Scientific Instruments Inc.

Feb. 2021- Jun. 2021

- Lead R&D engineer for new product development and existing product line support for neuroscience and electrophysiology applications
- Utilized piezo-electric bimorphs and strain gauges to accurately measure bimorph displacement and linearize the control of piezo displacement to successfully obtain a measurement resolution between 1 and 5 microns
- Debugged PID pressure control system to reduce signal noise and fine tune PID control loop allowing new product orders to be fulfilled and shipped with a more reliable and stable system

Electrical Engineer, Life Science Optics, IDEX Health & Science, LLC – Finger Lakes Instrumentation

Jul. 2020 - Jan. 2021

- Worked on electro-mechanical systems for optical imaging including high speed filter wheels and z-axis focusing devices
- Designed an automated test environment for life testing linear stage devices which included driving the devices for thousands of cycles while monitoring and reporting motor current draw, encoder position, and limit switch operation
- Collaborated with Mechanical Engineers to perform mechanical stress tests throughout life testing at periodic intervals to analyze and document device performance over its expected lifetime
- Debugged embedded firmware for an optical filter wheel device to solve position reporting issue and successfully pushed software patch to allow for major order to be fulfilled after being held up for over a year due to software bug
- Firmware design included working with stepper motors, hall effect sensors, encoders and serial communication peripherals

Co-Op/Intern, Analog Power Architecture and Applications, Microchip Technology Inc.

Mar. 2018 - Jul. 2020

- Worked within Analog Power and Interface Division of Microchip (APID) while also being a full-time engineering student
- Main roles included circuit board design, layout and assembly, hardware verification testing, thermal chamber testing, embedded systems software development, and board rework

PROJECT EXPERIENCE

Master's Degree Project- Remote Controlled Rover Embedded System, Binghamton University

Jan. 2021 - May 2021

- Designed a rover robot featuring wireless communication, and swiveling object detection using an FRDM KL25Z board
- Developed my own HAL device drivers for peripherals and hardware including SPI, UART, NRF24 transceivers, ultrasonic sensors, DC motors and stepper motors at the device register level
- Designed circuits around the Pololu DRV8833 and A4988 motor driver ICs for DC and stepper motor drive
- Successfully demonstrated the project to my faculty advisor and was granted recommendation for my Master Degree

Secondary Side Controller Standby Routine for Primary-Side Startup IC, Microchip Technology Inc.

Jun. 2019 - Jul. 2020

- Created a standby routine to control a primary-side start-up IC within an isolated flyback converter topology to maintain a low power standby state when no load is present
- Wrote Atmel SAMD10 MCU device drivers for analog comparator and pwm peripherals to allow for detection of over/under

- voltage conditions and communication between primary and secondary side controllers in an isolated flyback converter
- Developed a SIMPLIS model to accurately represent the standby routine as an analog block to be used as part of analog simulations demonstrating the standby capabilities in power converter simulations
- Routine allowed the device to turn on and off as needed within the bounds of over and under voltage thresholds for minimum power consumption in standby state

Senior Capstone Project- Mars Rover Robotic Arm, Binghamton University

Aug. 2019 - May 2020

Team Lead

- Worked within a team of five to develop a 3-D printed robotic arm subsystem for the Binghamton University IEEE Mars Rover Team
- Responsible for coordinating team meetings and managing cross functional tasks needed for project completion including mechanical, electronic and software subsystems
- Role as team computer engineer included designing the embedded control system for wireless communication and control of the arm's servo motors and gripper mechanism

MCP16311 DDPAK-3 Switching Regulator, Microchip Technology Inc.

Jun. 2019 - Aug. 2019

- Designed a step-down switching regulator module to serve as a drop-in replacement for DDPAK-3 package LDO devices
- Evaluated switching regulator vs. equivalent linear regulator over varying steady state loads for use in efficiency calculations
- Utilized thermal imager to analyze and compare thermal spread of each device over varying loading conditions
- Achieved significant increase in efficiency and decrease in device temperature with switching regulator when compared with the linear regulator in the same application

Computer Organization & Microprocessors Graduate Project, Binghamton University

Nov. 2019 - Dec. 2019

- Developed a program for an ARM Cortex M0+ MCU to control LED brightness and color selection of an RGB LED using a capacitive touch slider
- Wrote device drivers for hardware peripherals including the system timer (systick), LEDs, button and capacitive touch sensor
- Successfully distinguished between a tap input for color selection and a slide input for brightness on the same capacitive sensor

Autonomous Mine Detecting Robot, Binghamton University

Jan. 2019 - May 2019

- Designed an autonomous robot that had the ability to find metal washers or "mines" within a 6'x6' maze environment
- Developed software for autonomous motion using both an Atmega AVR 32u4 microcontroller and a Xilinx Spartan 6 FPGA
- Interfaced ultrasonic sensors for autonomous motion and obstacle avoidance and a metal detector circuit to count washers
- Successfully detected all "mines" in the course within the time allowed

Maze Solver Robot, Binghamton University

Apr. 2018 - May. 2018

- Used a Dagu Rover 5 robotic platform, a QTR light sensor, and an 8-bit Atmel MCU to complete a line maze made of tiles
- Wrote software for a maze solving algorithm targeted for the ATmega328p MCU using C language