Josh **Booth**

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WORK EXPERIENCE

CURRENT, FROM JUN 2022 (FT)

Microchip Technology
Applications/Marketing Engineer

Bridged the gap between technical aspects of 8-bit microcontroller products and their marketing strategies. This role involved educating the mass market and field reps of technical concepts by creating engaging demos and reference designs. It also involved contributing to the mass market strategy planning and execution for multiple products. Internally, I lead an analytics initiative that produced to better data-driven decisions about our marketing campaign strategies.

JUN 2017 - JAN 2022 (FT/PT)

United States Naval Research Laboratory
Electrical Engineer Student Trainee

I developed a machine learning and data analytic foundation through projects such as detecting and classifying objects in satellite imagery, recovered previously impossible to recover RF communications lost to noise using ML (ML lets us put the lost message in context of the other messages) and identify promoter sequences in DNA to speed-up genome identification.

SEP 2016, JUN 2022 (FT/PT)

Booth Oil and Gas LLC.
Prototype Engineer

I design and manufactured specialized prototypes for novel business problems the client faced in both day-to-day operations as well as for future expansion (see 3D PEEK Printer, AI-Driven Security System). I offered technical expertise for project planning, cost estimation, and feasibility studies. In addition to other project management tasks, I communicated with the client to manage their expectations and incorporate or remove features as their needs changed.

PUBLICATIONS

2023   App. Note 4889: Using Core Independent Peripherals (CIPs) to Implement a Peltier Cooled Metal Plate ⌗

2023   Embedded.com - Reducing BOM cost in embedded systems using advanced MCU peripherals ⌗

2018   Machine Learning in Radio Frequency Communications ⌗

2017   Prediction of Bacterial Promoter Sequences using Machine Learning ⌗
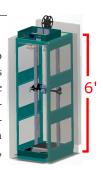
CORE COMPETANCIES

- **Technical:** C, Python, Linux, Marlin, Embedded Development, Digital Circuit Design, 3D CAD Design, Data Analytics
- **Software:** Git, Fusion 360, KiCAD, Eagle, Sourcetree, MPLAB X, XC8, Bash, FreeCAD
- **Other:** System Administration, Embedded Communications Protocols (I2C, SPI, DMX, UART, CAN), IT Professional

NOTABLE PROJECTS

DMX Light Show ⌗

A real-time audio processing light show highlighting the flagship features of the PIC18Q71 microcontroller. The design extracts bands of audio frequencies (bass, mid, treble, etc.) and sends the lighting information over DMX to 1 of 7 nodes to create a audio-esponsive light show. Some of the project's technical hurdles involved the design for proper low-noise analog and power design on the same PCB, fault-tolerant DMX and SPI communications, and implementing PoE for the high power requirements.

AI-Driven Security System ⌗

Protoype engineer for a solar-powered security system that gives real-time alerts with a classified video anytime a human, vehicle, or large animal is spotted on the property. The client also wanted all footage to be stored locally for legal purposes, so a custom program extracted motion clips after the footage was saved, which could then be reliably transported back to a central node to do the ML classification on.

3D PEEK Printer ⌗

Designed and built a large-scale 3D printer capable of printing engineering-grade plastics. This printer was specialized to print static mixers out of PEEK for biofuel refinement. Involved in the development was designing the kinematic system, thermal dynamics, and software to safely control it's operation while dealing with hazardous temperatures and voltages.

The Cold Plate ⌗

A reference design showing the most efficient way to perform common microcontroller tasks on a PIC16 such as temperature measurement, fan control, current monitoring, and UI-control; all wrapped up into an engaging demo. It has become Microchip's most copied code repository.

EDUCATION

2018-2022	**Computer Engineering**	
	SUMMA CUM LAUDE; 3.98 GPA; COMP ORG SI	
	Bachelors of Science	
	Shippensburg University of Pennsylvania	
2018-2022	**Mathematics**	
	Minor	
	Shippensburg University of Pennsylvania	

AWARDS

2020	Secret Security Clearance (inactive Mar 2022)
2018	Eagle Scout
2017	CompTia A+ Certified