Josh **Booth**

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Chandler, AZ

WORK EXPERIENCE

CURRENT, FROM JUN 2022 (FT)

Microchip Technology
Applications/Marketing Engineer

- Developed various demos on PIC and AVR microcontrollers.
- Wrote production-quality embedded C code for customers to use as reference.
- Developed microcontroller libraries for abstracted use.
- Created PCBs and structural enclosures for the demos.
- Led 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

- Used python for various machine learning and data analytic projects such as:
- Detecting and classifying objects in satellite imagery.
- Recovering RF communications lost to noise (BRNN w/ GRU cells.)
- Identifying promotor sequences in DNA to speed-up genome sequence identification (BRNN w/ LSTM cells.)

SEP 2016, JUN 2022 (FT/PT)

Booth Oil and Gas LLC.
Prototype Engineer

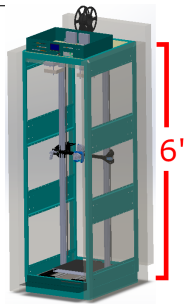
- Designed and manufactured prototypes for novel business problems (see 3D PEEK Printer, AI-Driven Security System).
- Offered technical expertise for project planning, cost estimation, and feasibility studies.
- I communicated with the client to manage their expectations and incorporate or remove features 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

NOTABLE PROJECTS

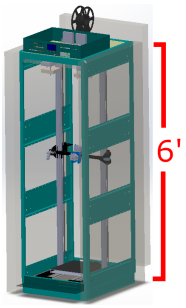


DMX Light Show

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

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