Josh **Booth**

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Chandler, AZ

WORK EXPERIENCE

Applications/Marketing Engineer | Microchip Technology

CURRENT, FROM JUN 2022 (FT)

- 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.

Electrical Engineer | United States Naval Research Laboratory

JUN 2017 - JAN 2022 (FT/PT)

- 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.)

Prototype Engineer | Booth Oil and Gas LLC.

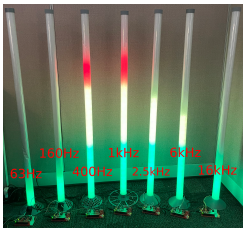
SEP 2016, JUN 2022 (FT/PT)

- 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.
- Communicated with the client to manage their expectations and incorporate or remove features as their needs changed.

EMBEDDED DEVELOPMENT PROJECTS

DMX Light Show

(EMBEDDED C, ANALOG & POWER DESIGN)

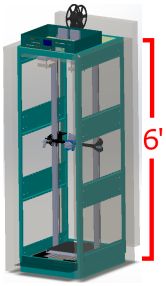


A real-time audio processing light show integrating audio filtering, DMX, DMA, PoE, and a hardware-encoded WS2812 driver; each node using a PIC18Q71 MCU.

Written C drivers for this project include UART, DMA, DMX, PWM, SPI, CLC, OP-AMP, and ADC configurations.

3D PEEK Printer

(EMBEDDED C, PYTHON, ANALOG & POWER DESIGN)



Designed and built a large-scale 3D printer capable of printing PEEK for biofuel refinement.

An STM32 MCU running Klipper and an Rpi running custom Python controlled the printer. 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.

AI-Driven Security System

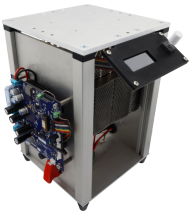
(PYTHON, BASH, MACHINE LEARNING)

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.

Custom python and bash programs handled data transfer throughout the mesh network and into/out of the neural network.

The Cold Plate

(EMBEDDED C, ANALOG & POWER DESIGN)



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.

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

EDUCATION

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

CERTIFICATIONS/AWARDS

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