Josh **Booth**

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🏠 Chandler, AZ

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 contributing to the mass market strategy for multiple products and creating demos and reference designs to explain technical concepts in an easily digestible way for the mass market and field sales reps. Internally, I also lead an analytics initiative that lead 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

Developed a machine learning and data analytic foundation through projects such as detecting and classifying objects in satellite imagery, recovering RF communications lost to noise by augmenting a message passing algorithm with ML (ML network can put the lost message in context of the other messages) and identify promoter sequences in DNA using Bidirection RNN with LSTM cells.

SEP 2016, JUN 2022 (FT/PT)

Booth Oil and Gas LLC.
Prototype Engineer

Developed 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
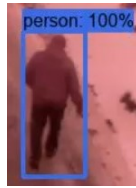
NOTABLE PROJECTS

DMX Light Show ✂

A real-time audio processing light show highlighting the flagship features on the PIC18Q71 microcontroller. Using a single OP-AMP, it extracts 7 bands of frequencies from an audio signal using a custom band pass filter design. It then sends lighting information over DMX to 1 of 7 nodes to create a light visualization. Each nodes updates it's WS2812 LEDs via their SPI drivers that have been logically equated to the 1-wire protocol using CIPs.
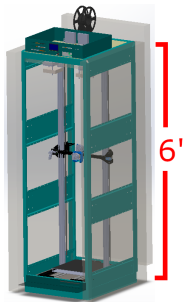

6'

AI-Driven Security System ✂

Prototype engineer for a solar-powered security system that gives real-time alerts with video anytime a classified 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.

6'

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