Josh **Booth**

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PROFESSIONAL SUMMARY

I am a self-taught multidisciplinary engineer who enjoys solving unique technical problems that need custom solutions. I excel at rapid prototyping, clear communication, and fast learning. My career started as a prototype engineer, building one-off solutions for clients. I pivoted to a technical marketer to improve my business acumen.

I am now looking to join a fast-paced engineering environment of other highly-motivated individuals to help create a successful business. I am currently seeking to join a fast-paced engineering team of driven professionals, aiming to contribute to the success of an innovative business.

WORK EXPERIENCE

Technical Marketing Engineer | Microchip Technology
CURRENT, FROM JUN 2022 (FT)

- Designed embedded reference designs for customers in the power systems, lighting, industrial and automotive spaces
  - Architected and wrote embedded C code for various 8-bit PIC and AVR microcontrollers
  - Created schematics, PCBs, and plastic/metal structural enclosures for product demonstrations
- Planned and executed launches for upcoming products in the 8-bit microcontroller space
- Organized app notes, use cases, and trainings to fit new products in a market niche

Electrical Engineer | US Naval Research Lab - Space Technology Division
JUN 2017 - JAN 2022 (FT/PT)

- Created machine learning models for detecting and classifying objects in satellite imagery to increase identification speed
- Recovered RF communications lost to noise by augmenting message-passing algorithms with machine learning
- Identified promotor sequences in DNA to speed up genome sequence identification using a BRNN w/ LSTM cells (co-authored infographic)

Prototype Engineer - Contract | Booth Oil and Gas LLC.
SEP 2016, JUN 2022 (FT/PT)

- Designed and manufactured prototypes for unique 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

SAMPLE PROJECTS

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 a Raspberry Pi running custom Python controlled the printer. Involved in the development was designing the kinematic system, thermal dynamics, and software to safely control its operation while dealing with hazardous temperatures and voltages.

6'
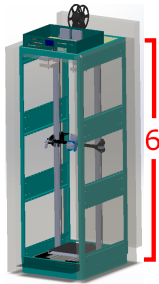
The Cold Plate 🔗   (EMBEDDED C, ANALOG & POWER DESIGN)

A thermal pump reference design showing the most efficient way to perform temperature measurement, fan control, current monitoring, and UI control. It has become Microchip's most copied code repository. Development involved SIMPLIS simulation, Altium design and embedded software architecture.

### 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.

person: 100%

DMX Light Show 🔗   (EMBEDDED C, ANALOG & POWER DESIGN)

A real-time audio processing light show integrating analog design with the microcontroller's OP-AMP, DMX, DMA, PoE, and a hardware-encoded WS2812 driver; each node used a PIC18-Q71 MCU. Utilizing the devices' CIPs, nearly no processing occurs on the CPU. Written C drivers for this project include UART, DMA, DMX, PWM, SPI, CLC, OP-AMP and ADC configurations.

Each tube's audio frequency peak:
63Hz, 160Hz, 400Hz, 1kHz, 2.5kHz, 6kHz, 16kHz
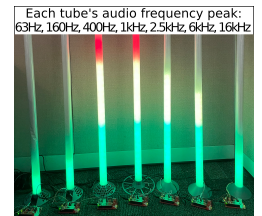
PUBLICATIONS

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

B.S. in Computer Engineering; Mathematics minor
SUMMA CUM LAUDE; 3.98 GPA; CMPE 322/120 SI; CLASS OF 2022
Shippensburg University of Pennsylvania

CORE COMPETANCIES

- **Technical:** C, Python, Linux, Marlin, Bash, Robotics, Embedded C Development, Digital Circuit Design, CAD Design
- **Software:** Git, Fusion 360, KiCAD, Eagle, MPLAB X, XC8