

NEIL WALSH

Computer Engineer

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EDUCATION

University of Wisconsin-Madison

BS, Computer Engineering
May 2023
GPA: 3.46

Notable Coursework:

Data Structures
Operating Systems
Digital Signal Processing
Object-Oriented Programming
Embedded Firmware
ASIC Design and Verification
PCB Design and Layout
Circuit Analysis
Technical Writing

KEY SKILLS

Languages:

Java
C/C++
Python
Bash
MATLAB
Verilog
HTML
XML
NodeJS
JSON

Tools, Concepts, Job Skills:

FreeRTOS
Git
TCP/IP/Networking
APIs
REST
Eclipse/Vim/VSCode
Electrical Bench Equipment
SPI/UART/I2C protocols
Circuit Prototyping
Micro Soldering
Mac/Windows/Linux

EXPERIENCE

Embedded Systems Intern – May-Aug 2022 – Matrix Product Development

- Designed and ran tests on low-power embedded circuits to predict battery life over years of use
- Worked on embedded firmware in C, C++ and Python using JSON, BLE standards and REST API
- Wrote firmware for low-power wireless communications modules
- Communicated effectively with hardware engineers for product specification questions regarding the ICs we used
- Edited and proofread schematics for embedded circuits
- Contributed to the design of multiple low-power Internet-of-Things products
- Worked with onSemi RSL10, Innophase Talaria TWO, and InPlay IN100 ICs and SoCs, writing firmware to read sensors and transmit data wirelessly
- Automated several administrative tasks related to shipping and assembly
- Prototyped and assembled boards using a reflow oven and soldering iron, sometimes hand soldering components as small as 0402 or 0201.

Service Mechanic– Mar 2021-Aug 2023– Budget Bicycle Center

- Worked in a team to repair bicycles in a fast-paced environment, quickly learning in-depth technical information and new skills

PROJECTS

Digital FM Synthesizer – 2023

- Worked in a team to design the schematic, board layout and code for a digitally generated synthesizer controlled by capacitive touch
- Wrote low-latency C code to generate a signal corresponding to the frequency of each note pressed, with potentiometer inputs read through an ADC
- Used real-time digital signal processing theory to modify the timbre and pitch of each note as it played using ADC inputs
- Optimized the generation of multiple sine waves to minimize time complexity and produce a clean and predictable output signal
- Used Modus-Toolbox, an eclipse IDE and GitHub for writing code and multimeters, oscilloscopes, soldering tools and UART for debugging

Microprocessor Video Game – 2021

- Used FreeRTOS to develop a handheld video game on the TI MSP432 microprocessor with a partner using Code Composer studio, an Eclipse-based IDE
- Wrote C code to handle control inputs and game logic within the FreeRTOS framework
- Personally handled accelerometer and button input and LCD animation and coordinated partner work through GitHub

Guitar Effects Pedals – 2017-2023

- Designed and prototyped analog and digital effects circuits
- Studied and tweaked existing circuit designs
- Investigated a business plan to build pedals more efficiently
- Explored Digital Signal Processing techniques to create real-time digital audio effects on the DaisyDSP chip platform