

Matt MacLeod

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SUMMARY

Ambitious Embedded Systems Engineer with 5 years of coding experience and over 3 years of professional involvement across all stages of product development in diverse industries. In my career, I've successfully contributed to numerous projects within teams of varying sizes. Most recently, I held the position of Firmware Engineer at AMD, where I contributed to the LPDDR5 and DDR5 memory programs. This experience has deepened my expertise in collaborative development environments, including managing pull requests, conducting code reviews, working with automated pipelines, and ensuring code quality through formatters, linters, and rigorous QA testing.

SKILLS

Languages & Protocols: C, C++, Python, CMake, Bash, git, perforce

Embedded Systems: Microprocessors: (Armv8-M, Armv7E-M, Avr), RTOS: (Zephyr, FreeRTOS), Interfaces: (SPI, I2C, UART, CAN)

Hardware: Design Software (Eagle, Altium, LTspice, VeriSystemC), Debug Tools: (gdb, RTT)

Lab Equipment: Oscilloscope, Logic analyzer, Digital Multimeter, Signal Generator, Power Supplies

WORK EXPERIENCE

Senior Firmware Engineer

MAY 2023 – July 2024 (1yr, 2Mo)

AMD

Vancouver, BC, Canada

- Wrote RISC-V based firmware solutions (in C) for DDR5/LPDDR5 PHY.
- Implemented features (using system C) from JEDEC specifications into an architectural model emulating DDR5/LPDDR5 PHY to expedite pre-silicon firmware development.
- Developed tools (using C++ 20) for emulating intrinsic analog characteristics of PHY to DRAM boundary to enhance training firmware accuracy.

Embedded Firmware Engineer

JULY 2021 – APR (1Y, 9MO)

Rainhouse

Victoria, BC, Canada

- **Lead electronics team** in start-up (team of 4), to deliver all required hardware, embedded firmware, and full stack software for a wireless IoT, SMART CNC machine tool product line. Resulted in successful delivery of TRL-7 prototype, SDK, and the filing of 2 international patents.
- Wrote optimized, **multi-threaded embedded software (in C)** for 2 dual core **ARM SoCs**, to facilitate the real-time transmission and reception of 7 independent sensors over Bluetooth low energy at 1Mbps throughput.
- Experience with full board bring up of embedded ARM SoC including PCB design, bootloader configuration, debugging hardware peripherals and writing embedded software.
- Wrote the full stack IoT architecture encompassing gRPC streams to achieve 99.99% signal transmission over upper limit of Bluetooth low energy.
- Wrote **embedded Linux**, Zephyr **RTOS** based drivers (in **C**) for the nrf5340 ARM SoC to interface accelerometer ICs, ADC controller ICs, PCM microphones, thermocouples, and force sensors for high performance data collection.

Electrical Systems Design Engineer (Internship)

JAN 2020 – AUG 2020 (8 MO)

Motorola Solutions

Vancouver, BC, Canada

- Developed a software for hardware, automation framework (using C++/python) to characterize the IO performance of SSDs, HDDs and raid controllers over a temperature hysteresis profile. Final solution resulted in a **12x faster test procedure** and improved the storage device characterization **accuracy by 50%**.
- Spearheaded the board bring up, **hardware re-design** (using Altium) and **debug** of a PoE controller board for an NVR product family. Resulted in successful delivery of first-generation rugged NVR product line.

Electrical Engineer (Internship)

MAY 2019 – AUG 2019 (4 MO)

Seaspan ULC

Vancouver, BC, Canada

- **Collaborated across multi-disciplinary teams** and managed sub-contractors to deliver electrical single line diagrams for Canadian Coast Guard and Naval vessels.
- Sourced several major electrical instruments that became standard among a replenishment ship for the Canadian Navy.

Jr Autonomous Systems Engineer (Internship)

SEPT 2018 – DEC 2018 (4 MO)

InDro Robotics

Ganges, BC, Canada

- Designed, built and tested a working TRL-7 prototype of an after-market payload deployment mechanism that could be actuated through the DJI hand controller and mounts externally onto DJI's M210 drone. Resulted in the solution becoming a part of the company's product line.
- Programmed **embedded Linux flight controllers using C++** to integrate third party sensors and cameras with OEM **drones** for remote sensing operations.

Electrical Engineer (Internship)

JAN 2018 – APR 2018 (4 MO)

AML Oceanographic

Sidney, BC, Canada

- Tasked with using limited resources to improve the existing quality control process of PCBs before the next stage of manufacturing
- Automated the testing procedure of raw circuit boards using a combination of custom PCBs, test jigs and firmware validation scripts to yield a 5x faster quality control process.

PERSONAL PROJECTS

Nissan Leaf Battery Analytics Framework (RP2040, C++, python)

- Goal: Decode the CanBus messages to persist intrinsic battery pack sensors from a depleted Nissan leaf pack to a cloud storage system for predictive analytics in a remote, off grid storage system.
- Embedded Systems: See custom [can bus decoding library](#)

LLM Voice Assistant (Python):

- Goal: Using open-source tools, create a voice to speech assistant that utilizes modern LLMs to respond to both interpret and respond in verbal prompts that can be deployed through any desktop.
- See Project [here](#)

More Coming soon. For now, check out my [GitHub!](#)

PATENTS

- Sensor-based Smart Tooling for Machining Process Online Measurement and Monitoring ([Available](#))
- Real-Time DAS and SDK for Machine Parameter Online Measurement and Monitoring ([Available](#))

EDUCATION

Bachelor of Electrical Engineering (Digital and Embedded Systems Specialization)

SEPT 2016 – AUG 2021

University of Victoria

Victoria, BC, Canada