

NOLAN MCCLEARY

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EXPERIENCE

Embedded Software Intern

May 2023 – Aug 2023

General Dynamics

Ottawa, Ontario

- Developed three separate linux drivers and their corresponding proxy services in C++ to acquire, decode, and stream critical Zynq Ultrascale+ MPSoC (Xilinx) information through a UNIX Domain socket and a series of custom JSON-RPC API endpoints. This included real-time monitoring of Processor and FPGA temperatures, Quad SPI (QSPI) partitions, and boot binary checksums.
- Wrote two separate front-end overlays in TypeScript to dynamically display streamed system info data on an in-house thin-client web application (Angular) used for field testing various applications including adaptive ballistic control systems, smart displays, and integrated networking solutions.
- Engineered an automated build system utilizing BASH scripting to allow the Ultrascale+ firmware core to be built without any external board-specific dependencies. Key components to be built included an Embedded Linux kernel (PetaLinux), FPGA image, bootloader, the root filesystem, and all relevant baremetal applications. This board-agnostic approach allowed for the creation of a unified GitLab CI/CD pipeline for the purpose of running static code analysis directly on the firmware core itself, allowing seamless testing and integration of new features across three separate Xilinx toolchains.

Embedded Systems Intern

Sep 2022 – Dec 2022

Teck Resources Limited

Sparwood, BC

- Developed the primary firmware codebase for a remote voltage transient detection system using an ARM-based microcontroller unit with functionality to handle MQTT-based networking, data acquisition, and remote system reconfiguration. Interfaced with the real-time operating system (RTOS) in order to implement a symmetric multiprocessing runtime, further improving system robustness and efficiency. This voltage monitor was deployed across multiple sites on-board Teck's haul truck fleet in order to collect information on high-voltage transients causing damage to the haul truck's edge computer power supplies.
- Suggested, prototyped, and successfully implemented a capacitor-driven uninterruptible power supply (UPS) to provide always-on functionality to the voltage monitor during transient-induced power cable disconnects.
- Added an adaptive scheduling and file retention mechanism for an in-house streaming service written in C#, allowing workers who missed important safety meeting live-streams to access the streamed slideshow documents from the computers on-board their haul trucks.

Wildland Firefighter

May – Aug 2020, 2021

Government of British Columbia

Vanderhoof, BC; Fort Nelson, BC

- Directed helicopter-based remote water transport and deployment operations while simultaneously managing water distribution networks and pump sites.
- Oversaw contract crew operations at multiple locations across the province.
- Resolved multi-crew conflicts and worked collaboratively in a fast-paced environment with short and unpredictable time frames.

Private Math Tutor

Sep 2019 - May 2020

Self-Employed

Vanderhoof, BC

- Ran a small-scale tutoring business and individually helped five students at both Nechako Valley Secondary School and the College of New Caledonia.
- Achieved a one hundred percent client satisfaction rate and developed an interest in articulating abstract concepts as effectively as possible.

EDUCATION

University of British Columbia

Vancouver, BC

Bachelor of Applied Science in Electrical Engineering

2020 - 2025

TECHNICAL SKILLS

Languages: C++, C, Python, Verilog

Developer Tools: Git, BASH, Linux, CMake, JIRA, PlatformIO

Networking: I2C, SPI, CAN, TCP/IP, MQTT, JSON-RPC

Technical Software: MATLAB, LTspice, Wireshark, Quartus Prime