# Nolan McCleary

250-944-0668 | nolancmccleary@gmail.com | https://www.linkedin.com/in/nolan-mccleary | https://github.com/ncm88| https://www.nolanmccleary.com

## Skillset

**Languages**: C++, C, Python, TypeScript
**Frameworks and Supporting Technologies**: Angular.ts, Next.js, Node.js
**Developer Tools**: Git, BASH, CMake, JIRA, PlatformIO
**Misc**: Embedded Linux, RTOS, I2C, SPI, CAN, TCP/IP Networking, MQTT, JSON-RPC
**Technical Software**: MATLAB, LTspice, Wireshark

## 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 Ethernet networking, data acquisition, and remote system reconfiguration. Interfaced with the real-time operating system (FreeRTOS) 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.

## Education

### University of British Columbia — Vancouver, BC

*Bachelor of Applied Science in Electrical Engineering* — *2020 - 2025*