

# NOLAN MCCLEARY

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## SUMMARY

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**Languages:** C++, C, Python, Verilog

**Development Tools:** Git, BASH, CMake, GDB

**Protocols:** UART, SWD, MQTT

## EXPERIENCE

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### Embedded Software Intern

May 2023 – Aug 2023

*General Dynamics*

*Ottawa, Ontario*

- Developed three separate Linux user space drivers 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 temperatures, Quad SPI (QSPI) partition boot status, 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).
- Engineered an automated build system via BASH and Buildroot 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 concurrently.

### Electronics Intern

May 2022 – Dec 2022

*Teck Resources Limited*

*Sparwood, BC*

- Designed, built, and tested a remote voltage monitor and regulation system for the purpose of eliminating and remotely reporting high-voltage transients occurring at operationally critical locations inside heavy equipment. This voltage monitor was deployed at multiple sites across Teck's haul truck fleet.
- 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.

## PROJECTS

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### Laser Projector

[Link to source code](#)

*February - April 2024*

- Designed, programmed and tested an STM32-based laser projector controller capable of drawing any shape at a rate of up to 1000 points per second.
- Applied real-time PD control with digital filtering to two DC motors simultaneously to facilitate precise beam control accurate up to one tenth of a degree.
- Developed a UART-Based laser image processing and streaming application to ensure compatibility with any file following the ILDA laser image standard including complex images and animations.

## EDUCATION

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### University of British Columbia

*Bachelor of Applied Science in Electrical Engineering*

*Vancouver, BC*

*2020 - 2025*