NIXON CHAN

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EDUCATION

University of Waterloo *2020-2025*
Bachelor of Applied Science: Mechatronics Engineering (Co-op) *GPA: 94%*
3x Engineering Term Dean's Honours List
Languages: Python, C++, C, C#, Rust | **Software:** Git, Linux, Azure, GCC, CMake, Make, Pytest, Docker, Jenkins, Jira/Confluence

TECHNICAL EXPERIENCE

Software Engineer - *Altohelix Corporation* *Aug 2021 - Present*
- Successfully led and mentored a team of engineers through the bring-up of a drone flight management web application.
- Led development on various novel features, such as creating LTE range-extension modules for the Boston Dynamics Spot.
- Architected an object detection application using Python, OpenCV, Azure Custom Vision, and Function App which enabled classification of over 10 live images per second from Spot and drones.
- Built a Dropbox web feature using C#, Razor Pages, Google Drive API, and Dropzone, enabling progressive file uploads.

ML Stack Software Engineer Intern - *Cerebras Systems* *Jan 2023 - Apr 2023*
- Significantly reduced distributed compute network packet latency by over 80% through the integration of RDMA-based technologies such as Mellanox VMA and Linux RSockets to replace the existing TCP sockets implementation.
- Applied heuristic and profile-guided compiler optimizations in GCC, Make, and CMake, resulting in a 9% reduction in training iteration time for billion-parameter models, which significantly improved overall system performance.
- Automated debug output cookie hashing for weight streaming buffers and MLIR operations using Boost and C++17, improving debugging and error analysis for complex distributed systems.

Linux Systems Software Developer Intern - *Dejero Labs* *May 2022 - Aug 2022*
- Developed a Linux CVE scanner for CI using Python and Jenkins to automatically scan 500+ Debian builds within 15 seconds.
- Created and integrated unit test coverage tools into the build sequence using Jenkins Plugins and improved the quality of code coverage analysis using gcovr, pytest, and gocov-xml to generate Cobertura XML coverage files.

UAV Autopilot Embedded Software Engineer Intern - *UWaterloo Aerial Robotics Group* *Jan 2021 - Apr 2022*
- Engineered autonomous takeoff and landing control systems for a fixed-wing aircraft using C++17 and finite state machines.
- Enhanced the performance and reliability of the attitude control system and flight dynamics using Simulink and GDB.
- Introduced an SD card driver for STM32F7 using STM32 HAL and FatFS for data storage and logging.

Software Quality Analyst Intern - *i4i (Infrastructures for Information)* *Sep 2021 - Dec 2021*
- Created an Excel data conversion tool that automatically converts data into XML using Python and XSLT, reducing user data entry time by approximately 95%.
- Manually tested scripts for a portal-based pharmaceutical document authoring application using QaTraq.

PROJECTS

Neural Net in Rust *Feb 2023*
- Developed a neural net in Rust and trained on MNIST, achieving 95% accuracy on a hundred-parameter model.
- Implemented various loss optimization algorithms in Rust including SGD, mini-batch GD, and Adam.

Labyrinth RTOS *Dec 2022*
- Built a preemptive EDF scheduling RTOS in C and ARM assembly for a LPC1768 (Cortex-M3) as a part of the MTE 241 course
- Programmed interrupt handlers and multi-threaded/task handling to increase CPU utilization and prevent race conditions
- Debugged RTOS using Keil uVision debugger, analyzing ARM assembly instructions and register information

AWS DeepRacer WildCard Competition *May 2022*
- Competed against graduate and undergraduate students across Canada during the AWS Ottawa WildCard competition, achieving a time of 11.3 seconds and placing 2nd/13.
- Trained reinforcement learning agent for autonomous 1:16 scale racing using PPO and a customized reward function.