NIXON CHAN

nixonchan.dev | LinkedIn | +1 (647) 923-2316 | ctnchan@uwaterloo.ca | Toronto, Canada

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, C/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 new drone flight management web application.
- Led the development on various novel feature bring-ups, such as creating VPN and LTE range-extension modules for 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 Boston Dynamics 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 and integrated a Linux vulnerability scanner in Python with Jenkins, automating security scanning for builds using Jenkinsfiles and Groovy scripts, which significantly improved build efficiency and system security. The scanner was capable of scanning over 500 Debian packages for vulnerabilities in ~15 seconds.
- Created and integrated unit test coverage tools into the build sequence using Jenkins Plugins and improving 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 and tested autonomous landing and takeoff control systems for a fixed-wing aircraft by designing, simulating, and implementing algorithms with C++ and finite state machines (FSMs).
- Enhanced the performance and reliability of the attitude control system and flight dynamics by using Simulink and GDB.
- Introduced an SD card driver for STM32F7 using STMCubeMX and FatFS, providing data storage and logging capabilities.

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 From Scratch
- Developed a neural net in Rust and trained on MNIST, achieving 95% accuracy on a hundred-parameter model
- Implemented various optimization algorithms, such as SGD, Mini-batch GD, and Adam in Rust

AWS DeepRacer WildCard Competition
- Trained reinforcement learning model for autonomous 1:16 scale racing using PPO and a customized reward function
- Competed against graduate and undergraduate students across Canada during the Ottawa wildcard competition, achieving a time of 11.3 seconds and placing second overall