

# Nixon Chan

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## Skills

**Languages:** Python - C++ - HTML/CSS - SQL - C# - Arduino - Matlab/Octave - XML - Groovy

**Tools:** Git - Linux - Azure - Jenkins - Jira - SSH - Simulink - .NET Core - Razor Pages

**Hardware:** Solidworks - Fusion360 - DMM

## Experience

### AI/ML Software Developer (Part-Time Contract)

Aug 2021 - Present

*Altohelix, Markham, ON*

- Architected a sign recognition application for Boston Dynamics Spot using **Python**, **Azure Custom Vision** and **Function App** to classify over ~600 live images per minute
- Extended recognition application to extract and analyze frames from drone capture videos using **OpenCV**
- Integrated LTE wireless range extension functionality into Boston Dynamics Spot using **SSH**, **Linux**, **Raspberry Pi**, and **Azure VM**
- Created a VPN server on Azure VM using **OpenVPN**, **SSH**, and **SCP**, and utilized **iptables** to forward port traffic to Raspberry Pi
- Developed thermal recognition system with **Raspberry Pi** thermal camera using **Adafruit Circuit Python**
- Developed drop box website feature using **C#**, **Razor Pages**, **Google Drive API**, and **Dropzone** to enable file uploads
- Automated blob storage to database metadata synchronization using **Python**, **Azure Function App**, and **SQL**

### Linux Systems Software Developer Intern

May 2022 - Aug 2022

*Dejero, Waterloo, ON*

- Implemented a **Linux** vulnerability scanner application in Python, scanning over 500 Debian packages for issues in ~15 seconds
- Integrated security scanner with **Jenkins** to automate security scanning for builds using **Jenkinsfiles** and **Groovy** scripts
- Created **HTML/CSS** vulnerability output tables for better user comprehension and data digestion using **Jinja** templating
- Implemented unit test coverage tools using **gcovr**, **pytest**, and **gocov-xml** to generate **Cobertura XML** coverage files
- Integrated coverage files into build sequence using **Jenkins Plugins**, allowing developers to rate coverage on their CR's
- Implemented tool in **Python** to analyze code coverage of a given commit SHA using set theory operations

### UAV Autopilot Embedded Software Engineer Intern

Jan 2021 - Apr 2022

*University of Waterloo Aerial Robotics Group, Waterloo, ON*

- Designed, simulated, and tested autonomous landing and takeoff control systems on a fixed wing aircraft using **C++** and **FSM's**
- Restructured and debugged the previous attitude control system using **Simulink** and **GDB**
- Optimized **Simulink** and PID model to better represent flight dynamics and tested path following using Flight Gear
- Researched and introduced SD card driver for STM32 F7 using **STMCubeMX** and **FatFS**

### Software Quality Analyst/Developer Intern

Sep 2021 - Dec 2021

*i4i (Infrastructures for Information), Toronto, ON*

- Designed conversion tool automating Excel data conversion into **XML**, using **Python** and **XSLT** reducing user input time by ~95%
- Tested scripts relating to company database and Microsoft Word authoring tool using **QaTraq**

## Honours and Awards

**Academic:** 1B&2A Term Dean's Honour List - University of Waterloo President's Scholarship of Distinction

**Non-academic:** Alex Venables Scholarship in Engineering - Air Cadet League of Canada Scholarship - Duke of Edinburgh Silver - Lord Strathcona Medal - Glider Pilot Scholarship/License

## Projects

### AWS DeepRacer Wildcard Competition (2<sup>nd</sup> Place)

- Trained **reinforcement learning** agent to drive a 1:16 scale race car around a track, purely using a camera as input
- Competed against graduate and undergraduate students across Canada during the Ottawa wildcard competition, achieving a time of 11.3 seconds and placing second overall

### Embedded Voice Recognition (Keyword Spotting)

- Developed keyword recognition system using **Edge Impulse**, with a 90% audio recognition accuracy
- Extracted features from audio datasets using anti-aliasing, Fourier transforms, and mel frequency cepstral coefficients

## Education

### BASc: Mechatronics Engineering

Sep 2020 - Present

University of Waterloo - Waterloo, ON - GPA: 93%