Nixon Chan

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Education

Bachelors of Applied Science: Mechatronics Engineering ***Sep 2020 - Present***

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

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** and **I2C**
- Developed dropbox web feature using **C#, Razor Pages**, **Google Drive API,** and **Dropzone,** enabling progressive file uploads
- Automated blob storage to database metadata synchronization using **Python, Azure Function App,** and **SQL**, processing new cold start triggers in ~30 seconds

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: 2x 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 (2nd Place)

- 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

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