

## EDUCATION

### University of Waterloo Mechatronics Engineering

Bachelor of Applied Science—2020

## EXPERIENCE

### Firmware Engineer Level - 2019

**Created** shim layer for nRF5 SAADC driver to allow concurrent use of the peripheral between voltage and current monitors.

**Implemented** low battery detection for locks by monitoring voltage droop during lock operation and chimes.

**Characterized** current consumption to detect motor stalls and prevent system brownouts.

### Product Engineer Sera4 - 2018

**Designed** procedure to calibrate product RTCs within 10s without the need for equipment external to the product.

**Created** python library to enable remote access & control of BLE enabled lock controllers.

**Enhanced** product test fixtures by re-designing PCB to fix serial communication and adding functionality for BLE tests, re-flashing firmware during tests and more.

### System Stability Engineer Ford Motor Company - 2018

**Designed** and automated functional tests for infotainment system ECUs using the Slash framework.

**Maintained** code quality and dependability through embedded bug fixes for ECU stability monitor.

**Executed** and documented embedded device functional test cases to support application integrity.

### Computer Engineer AGFA Graphics - 2016

**Developed** and tested user control software for industrial printers in C++ and QT used for GUI.

**Improved** product safety by implementing a collision detection setting allowing the print head to scan for possible collisions prior to printing.

**Increased** bulk printing efficiency by 150% through implementing layered pauses; allowing users to set 'media change' pauses prior to printing.

## SKILLS

### Software Tools

C	QT
C++	MQTT
Python	ROS
Matlab	Bluetooth LE
Git & SVN	Keil RTX-RTOS
nRF5 SDK	Linux

### Hardware

Altium Designer  
NXP LPC1768  
Jetson Nano  
Nordic nRF52  
STM32 Nucleo  
Logic Analyzers

## PROJECTS

### CycleVision [cyclevision.co](https://cyclevision.co)

An integrated bicycle safety system utilizing the Nvidia Jetson Nano. The system uses a CNN with a real time camera feed to detect potential collisions with approaching vehicles and pedestrians. It is also equipped with controllable turn signals and night lights as well as a companion app for viewing the camera feed, directions and riding statistics.

### Gait Phase Detector

A C++ program that detects the different phases of bipedal movement in real time. The detector reads data from accelerometer and gyroscope sensors attached to a person's foot, filters and processes the signals and displays the data in a Qt GUI.

### Autonomous Rescue Vehicle

An all terrain search and rescue vehicle controlled by an ATmega2560 and RPi. The vehicle is equipped with a variety of sensors to maintain localization, detect obstacles and find targets while autonomously navigating its terrain.

### RTX Space Attack!

A space battle video game developed on the Keil LPC1768 evaluation board. The game uses the RTX-RTOS to implement and manage concurrent threads for the various components of the game and players control their space craft using the onboard push buttons and joystick.

### Linear Variable Differential Transformer

An electro-mechanical transducer used to measure displacement through change in induced EMF. An Arduino collects the output and displays the final displacement with 3% uncertainty.

### Lazy Car (Self Driving Robot)

A self driving robot controlled by a PIC microcontroller and equipped with phototransistors, a thermistor and a hall effect sensor. The robot uses step detection to remain on track and is capable of detecting electro-magnetic fields and sampling temperatures along its course.