

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

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.