Michael Hosue

3B Mechatronics Engineer

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SKILLS

Software Tools

C
C++
Python
TCL
Matlab
Git & SVN
Slash
QT
MQTT
ROS
Bluetooth LE
Keil RTX-RTOS
Linux
Bash

Hardware

Altium Designer
Arduino
NXP LPC1768
PIC
Nordic nRF52
STM32 Nucleo
Logic Analyzers

Courses

Linear Systems and Signals
Automatic Control Systems
Algorithms and Data Structures
Computer Structures and Real Time Systems
Microprocessor Systems and Interfacing
Sensors and Instrumentation
Actuators and Power Electronics

EXPERIENCE

System Stability Engineer
Ford Motor Company - 2018

Designed and automated functional tests in Python (using Slash) for ECUs running QNX.

Maintained code quality and dependability through embedded bug fixes for infotainment system stability monitor (C++).

Product Engineer
Sera4 - 2018

Created python library (shipped to customers) which enables remote access & control of BLE enabled lock controllers.

Enhanced product test system by re-designing PCB to fix UART communication and adding functionality for automated BLE tests, re-flashing firmware during tests and more.

Designed procedure to calibrate product RTCs within 10s without the need for any additional tools.

Software Developer
Avidbots - 2017

Created messaging system between robots and web application via MQTT to show status updates.

Updated and maintained angular web application, PHP APIs and telemetry streamer in respective docker containers.

Implemented cleaning map generation software for web application in Java.

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.

Security Researcher
Blackberry - 2015

Identified key steps to cross compile linux kernel fuzzer for Blackberry phones and fuzz android specific kernel modules.

PROJECTS

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 (ongoing)

An all terrain search and rescue vehicle controlled by an ATmega2560 microcontroller and equipped with a variety of sensors to maintain localization, detect obstacles and find targets. The vehicle is designed to autonomously navigate flat land, sand and water, locate and extinguish fires, find and deliver food and locate stranded (Lego) survivors.

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.

Bright Box
1st place at UofT Hacks

Created smart light switch using “Particle” prototyping board providing users control and ability to set alarms and schedules over HTTP requests via an android application.