NATHAN LEUNG *3A Mechatronics Engineering, University of Waterloo*

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Summary

- Accomplished software engineer with background in **embedded systems** and **real-time operating systems**
- Experienced in the following programming languages: **C**, **C++**, **Python**, **Java**, and **MATLAB**
- Practical knowledge of software tools and protocols such as SMS communication, AT commands (for cellular modems), Bluetooth LE (Low Energy), Google Protocol Buffers, the command line, and Git

Experience

Embedded Software Developer | **Clear Blue Technologies Inc.** Fall 2016

- Contributed to the embedded software architecture for cloud-connected solar/wind powered street lights
- Upgraded cellular communication firmware to use AT commands; involves controller/modem handshaking to utilize more complex functionality
- Built SMS-based communications engine to manage operation when primary cloud connection drops
- Reduced the hardware failsafe latency—to cease unsafe voltage/current levels—from 1s to 0.25s
- Implemented verification tests for technicians to ensure functionality of peripheral motion sensors
- Wrote unit tests and documentation for all assigned projects, while also handling reported bugs from QA
- Worked in a fast-paced team environment; used Agile Kanban development framework to push changes daily (for end-of-day builds) and participated in daily standups

Research and Development Engineer | **Lumentra Inc.** Winter 2016

- Developed a smart light-intensity measuring device that is controlled by an Android app over Bluetooth LE
- Prototyped with a microcontroller (running an RTOS) to collect data from an I2C light sensor in C
- Implemented crucial features on the Android app in Java and XML, such as graphing light intensity in real time, and storing/retrieving saved measurements with SQLite

Engineering Design Co-op | **Centerline Ltd.** Spring 2015

- Developed a work flow system to prepare aluminum rods; reduced time of the existing process by 45%
- Designed and edited CAD models of Centerline products using Autodesk Inventor 2014 and AutoCAD

Projects | nathan-leung.github.io/projects/list

Zombie Survival Embedded Video Game | *C* Spring 2016

- Top-down survival game built on an embedded microcontroller with a real-time operating system
- Allows the player to use a joystick to pick up bombs and trigger interrupt-driven explosions, which kill the randomly generated zombies that chase the player around an LCD screen

Audio Frequency Spectrum Visualizer | *MATLAB* Spring 2016

- MATLAB application that displays the magnitudes of frequency bands of an audio sample in real-time
- Used simulated band pass filters to measure the magnitude of each band, which have center frequencies ranging from 35Hz to 20000Hz, and displaying them in a bar graph updated every 50ms

Bluetooth Automated Door Lock | *Java (Android), C++ (Arduino)* Spring 2015

- Password-protected door locking mechanism, which uses an Arduino-connected motor controlled via Bluetooth from an Android application