

Sebastian Fiorini

3A MECHATRONICS ENGINEERING

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Skills

Languages C, Python, Java, C++, GoLang, Bash, Labview, MATLAB

Tools Linux, gdb, vim, Make, git, mercurial, VirtualBox, Docker, Travis CI

Technical Knowledge Algorithms, Data Structures, RTOS, Electronic Lab Test Equipment, I²C/SPI/UART

Work Experience

Embedded Software Engineer

North York, Ontario

CLEAR BLUE TECHNOLOGIES

December 2016 - April 2017

- Designed, tested, and deployed networking, battery management, and lighting capabilities on embedded streetlight controller in C through over the air updates
- Developed method to avoid flickering lights with *ATMEL DSP* libraries when unreliable third party hardware was used
- Debugged hardware *interrupts* and wrote waveform initialization routines for inverter loads to reduce their inrush current
- Worked with *XBee*, *ZigBee* chips, and *3G cell modems* to establish internet connections and obtain *GPS* coordinate information
- Optimized controller battery life by designing a new charging phase to extend power generation from solar panels and wind turbines on cloudy and wind-free days

Software Engineer

North York, Ontario

CLEAR BLUE TECHNOLOGIES

April 2016 - August 2016

- Designed calls between controller and cloud using *Google Protocol Buffers* to download system settings and send telemetry data
- Developed and implemented state machine for LEDs on controller for installers to determine communication status with cloud
- Created generic modem interfacing program (similar to Unix *chat*) for bare metal software to easily work with different modems
- Conducted database administration activities and document updates in *MongoDB* to ensure API call job queues worked correctly
- Forked miniterm.py to monitor controller behavior and graph IO data over time of controller ports
- Wrote client side git hooks in *bash* to ensure code style adherence using *Clang*

Automated Test Engineer

Mississauga, Ontario

COOPER INDUSTRIES, FIFTHLIGHT LTD

September 2015 - December 2015

- Designed tests for embedded controller to check adherence to lighting protocol using *LabView* and NI TestStand
- Worked with *USB*, and *RS-232 DLL's* to control PSU's and programmable load banks for custom built testing applications
- Soldered PCB boards for firmware development and prototyping

Projects

Multithreaded 2048

- Recreated the popular tiling game 2048 for Keil RTX RTOS with multiple *threads* and *semaphores* to control game logic
- Wrote colour conversion algorithms to create colour wheel effects when spinning on-board potentiometer
- Currently in the process of porting the code over for terminal use with ncurses library

Linear Voltage Displacement Transformer

- Designed and tested hardware and software in order to accurately measure displacements up to $\pm 0.22\text{mm}$
- Converted *Arduino* 5V DC signal into sinewave using *555 timer* and a series of low pass filters
- Amplified output signal to 5V and used peak detector in order to improve accuracy when reading from ADC

Satellite Modem Management

- Wrote and tested modem interfacing software in C for Cubesat running an *embedded Linux OS*
- Referenced data sheets to write AT commands to open and manage point-to-point protocol connection with ground station

Education

University Of Waterloo

Waterloo, Canada

BACHELOR OF APPLIED SCIENCE, MECHATRONICS ENGINEERING

September 2014 - Expected April 2019

- **Relevant Courses:** Computer Interfacing, Power Electronics, Sensor and Instrumentation
- Overall GPA of 3.75

Interests

Linux Ricing (Visual Modification), Cuisine, Hiking, Quentin Tarantino Movies, FIRST Robotics