# Sebastian Fiorini

3B Mechatronics Engineering

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## Skills

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

**Tools** Linux, gdb, vim, Make, git, mercurial, VirtualBox, Docker, SaltStack, Buildroot, Travis CI, Jenkins

**Technical Knowledge** Algorithms, Data Structures, Real Time Systems , Electronic Lab Test Equipment, $I^2C$/SPI/UART

## Work Experience

### Embedded Software Engineer

*Sunnyvale, California*

Nuvation Engineering

*September 2017 - Present*

- Served as a consultant and developer to manage customized Linux OS images for unreleased third party client products
- Redesigned software update procedure for embedded Linux machines to significantly reduce update and configuration time
- Developed new scheduling features and API for a custom bare metal scheduler to simplify scheduling of periodic events
- Improved on-board STM32 programmer by analyzing and modifying hex files to increase flashing speed by factor of 10

### 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 API 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

### 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 programmable power supplies and load banks for custom built testing applications

## Projects

### Submarine Design - *Current*

- Writing PID controller to maintain submarine depth and orientation when moving around an obstacle course for MTE 380
- Using computer vision localization algorithms to detect marked golf balls when navigating a known course map

### Linear Voltage Displacement Transformer

- Designed the hardware and software from scratch in order to accurately measure displacements up to ±0.22mm

### Satellite Modem Management

- Wrote and tested modem interfacing software in C for Cubesat running an *embedded Linux OS*
- Wrote 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**: Microprocessors, Real Time Systems, Power Electronics, Sensor and Instrumentation