# Thomas Riley

2A Honours Electrical Engineering
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## Skills

**Languages:** C/C++, Java (including Android), LaTeX, Bash, VHDL, MATLAB, Python

**Operating Systems:** Linux (Debian, Fedora, Arch Linux) , Windows, macOS

**Applications:** Altium EDA, Upverter, Kiel $\mu$Vision, AutoCAD, emacs, Android Studio, MS Word, MS Excel

**Lab Skills:** Electronics troubleshooting and verification using D.S.O., D.M.M. etc; SMD Soldering

## Experience

**Electronics Designer / Firmware Developer** — **GymNext**
Penetanguishene, On — *May 2017 - Aug. 2017*

- Designed a new edition of the FlexTimer, a BLE controlled gym timer. Migrated current project from RFduino based chip to Rigado chip set.
- Wrote firmware in C using the Kiel $\mu$Vision 5 IDE for the Nordic nRF52 (ARM Cortex-M4F based SoC).
- Used lab equipment such as a oscilloscope, function generator, and multimeter to design a circuit to implement a digitally controlled variable volume buzzer at a low cost.
- Used Altium CircuitMaker to design the schematic and PCB layout for both the control and display board.
- Hand assembled boards using air-gun reflow and a reflow oven to solder SMD parts. Tested and verified boards using oscilloscope, digital multimeter and frequency counter.

**Hardware Electrical Team Member** — **Midnight Sun Solar Rayce Car Team**
Waterloo, On — *Sept. 2016 - Feb. 2017*

- Worked as part of a team to design a solar race car to compete in the American and World Solar Challenges.
- Co-designed a motor precharge circuit to limit the inrush current to the motor controller, as well as a model of battery module to be implemented in battery enclosure.
- Tested motor precharge circuit using lab test equipment including oscilloscope, digital multimeter, and power supply.
- Gained introduction to circuit design with Altium Designer CAD software.

## Projects

**LED Array Counter** — July 2015

- Created LED array and wrote accompanying C++ Arduino code in order display counter on LEDs.
- Soldered LEDs in array connecting cathodes in rows, and anodes in columns to order to make individual LEDs indexable (by driving cathode HIGH and anode LOW). The leads were then connected to a pin header in order to make them controllable by Arduino.
- Used clocked refresh to take advantage of persistence of vision in order to allow multiple LEDs to appear to be on at once.

**Wireless Power Transfer Circuit** — January 2016

- Designed an circuit on perf. board that powers LED wirelessly.
- Used 555 timer as an asynchronous multivibrator to switch N-channel MOSFET, creating pulse signal in primary coil.
- Used inductive coupling in order to transfer power to secondary coil attached to LED

**Custom Mechanical Keyboard** March 2016

- Created 'Ergodox' ergonomic mechanical keyboard from open-source design.
- Purchased parts from various sources and had board fabricated, then hand soldered switches and components to board in order to create keyboard.

**Triangle Solver Android App** March 2016
(Academic)

- Created app which when given three pieces of information about a triangle (side lengths or angles), will calculate all other sides and angles.
- Allowed user to enter information in either degrees or radians.
- Prevented user from entering erroneous input, and prompts user if they enter parameters which cannot form a valid triangle.

**Dots and Boxes Game Android App** April 2016
(Academic)

- Created simple two player game in android studio based on the classic paper and pencil game.
- Used object oriented programming to simplify design.
- Wrote well commented code in order to ensure code readability.

**Created Personal Website** December 2016

- Created website using Jekyll software to generate static site from custom written HTML/CSS that could be hosted on GitHub pages.
- Used liquid template language to organize Jekyll site, and used markdown to write articles for site.
- Incorporated features such as pagination and Facebook comments into blog posts.

## Education

**University of Waterloo** Waterloo, ON
Bachelor of Applied Science Candidate, Electrical Engineering *Sep. 2016 - Present*

- Cumulative GPA: **3.97/4**
- Engineering Ambassador (Fall 2017)
- Waterloo Rocketry Team (Fall 2017)
- Academic Class Representative (Winter 2017-Present)
- Volunteered at Fall Open House (Fall 2016) as Engineering representative, and Engineering Orientation (Fall 2017) as a leader.

## Awards

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| Rank 1 in Electrical Engineering 1B | Winter 2017 |
| Rank 7 in Electrical Engineering 1A | Fall 2016 |
| President's Scholarship of Distinction | 2016 |
| The Governor General's Academic Medal | 2016 |
| Prince Philip Scholarship | 2016 |
| Principal's Award | 2016 |
| National Biology Scholar | 2016 |
| Frey Science Award | 2016 |
| Euclid Contest Distinction | 2016 |
| Character Recognition Award | 2016 |