Ryan Chen

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Education

University of Waterloo **Expected April 2031**

Bachelor of Applied Science in Electrical Engineering *Waterloo, Ontario*

President's Scholarship of Distinction

Availability: 4-month co-op term, January – April 2027

Relevant Coursework: ECE 198 (Project Studio) – breadboarded an RLC band-pass filter, measured its frequency and phase response with an oscilloscope and function generator, and plotted the results to locate resonance.

Technical Skills

Languages: Verilog, Python, C/C++, MATLAB
Digital Design: RTL Design, Simulation Testbenches (cocotb), Clock-Domain Crossing (CDC)
Hardware & Lab: KiCad (Schematic Capture, PCB Layout), Oscilloscope, Function Generator, Multimeter, LCR Meter
Tools & Protocols: Git, PlatformIO, Arduino, Breadboarding, I2C, UART, SPI

Projects

SPI-Controlled PWM Peripheral – UWASIC (ASIC Design Team) | *Verilog RTL, cocotb* **Oct 2026**

- Wrote a mode-0 SPI peripheral in Verilog RTL that receives 16-bit commands and sets five registers controlling the team's 16-output PWM module; handled clock-domain crossing with two-flip-flop synchronizers into the 10 MHz clock.
- Verified the design in simulation, writing cocotb testbench tests for PWM frequency and duty cycle; all three tests pass.

Power Monitor – Personal Project | *C, Python, Arduino Uno, INA219* **Sep 2026**

- Breadboarded, debugged, and bench-tested a power monitor circuit with an Arduino Uno reading an INA219 sensor over I2C, validating DC load voltage within 1% and current within 2% of a multimeter across 5 test points.
- Streamed 10 samples per second over UART as 25-byte CRC-checked packets to a Python tool that logs to CSV and plots live; a 10-minute test logged 6,000 packets with 0 dropped and 0 checksum errors.
- Wrote the design spec and managed task-by-task implementation, reviewing and testing each change before committing; the integer-only C firmware's logic is covered by 72 C and 146 Python unit tests.

Experience

Electrical Team Member **Sep 2026 – Present**

Electrium Mobility *Waterloo, Ontario*

- Designed an H-bridge motor driver PCB in KiCad for a 9 V brushed DC motor driven in both directions at up to 200 mA; selected components, captured the schematic, and completed the board layout, passing ERC and DRC.
- Bench-tested the assembled H-bridge board for functionality, confirming it performed as designed.
- Planning how to fit the battery pack and wiring inside the frame of the team's electric bike; trained in the team's procedures for spot welding, charging, and handling energized lithium packs.

Research Assistant – Reinforcement Learning **Jun 2026 – Aug 2026**

University of Alberta *Edmonton, Alberta*

- Built a Q-learning agent in MATLAB that learned the shortest path through a 5×5 grid world after 500 training episodes, implementing the epsilon-greedy policy and Bellman equation.
- Fixed a bug that made the agent repeat the same move in untrained states by adding random tie-breaking; reported results to the supervising professor weekly and in a technical report.

Assistant Instructor **Sep 2025 – Jun 2026**

Kumon *Edmonton, Alberta*

- Delivered math and reading instruction to 80+ students aged 5–16, adjusting problem sets to individual learning pace.

Junior Coach **May 2025 – Jun 2026**

B-Active Badminton Club *Edmonton, Alberta*

- Led specialized drills and matches for 50+ junior athletes twice weekly, providing technical feedback.

Athletics & Leadership

Competitive Badminton **Sep 2018 – Jun 2026**

- **6-Time Provincial Champion**; #1-ranked junior in Alberta; national bronze medalist; **High School Team Captain**