

## Education

**University of Waterloo, BAsc Honours Mechatronics Engineering** Expected Graduation Apr 2026 | cGPA 3.96/92%  
**Courses:** Microprocessors and Interfacing, Actuators & Power Electronics, Computer Structures & RTOS, Autonomous Mobile Robots

## Skills

**Hardware:** STM32, Raspberry Pi, Arduino, USB, I2C, UART, CAN, Serial, Ethernet, 3D Printing, SMD Soldering, Rework  
**Design and Test Tools:** Altium (ECAD), LTspice, Vector Network Analyzer, Oscilloscope, Waveform Generator, SolidWorks

## Experience

**Core Member | Watonomous Design Team (UWaterloo Self Driving)** Nov 2025 - Present | Waterloo, ON, CA

- Implementing sub-millisecond timing and synchronization accuracy between the computer, Velodyne LiDARs, and global shutter CMOS cameras by implementing PTP over Ethernet using a Novatel GPS as the grandmaster and STM32 as a hardware trigger

**Hardware Engineering Intern | Verkada** May - Aug 2025 | San Mateo, CA, USA

- Proposed a novel product complete with comprehensive documentation including hardware block diagrams, power budget analysis (15+ subsystems), BOM cost breakdowns with margins, and mechanical integration specs for JDM kickoff readiness
- Designed and validated power architecture for Power-over-Ethernet siren-speaker product, implementing a boost-buck capacitor load smoothing circuit that reduced peak current by 11.5% and variance by 38% while maintaining system efficiency above 90%
- Developed test infrastructure for wired sensor systems including multi-device daisy-chain fixture with configurable cable lengths up to 1000m, conducting signal integrity analysis and comparative setup variation testing using oscilloscope measurements
- Implemented firmware in C for RS485 communication retry mechanisms, IR-based anti-masking detection algorithms, and I2C accelerometer drivers, integrated with Python scripting for real-time data visualization and CSV logging for validation testing

**Electrical Engineering Intern | WHOOP** Jan - May 2025 | Boston, MA, USA

- Involved in the schematic entry, layout, validation, and rework for WHOOP 5.0, WHOOP MG, and the Basic Charger, supporting devices produced in the hundreds of thousands units designed to be worn on-body 24/7 by millions of people
- Performed V&V with EVT, DVT, and PVT for the wireless power transfer (WPT) hardware integrated with NFC wireless charging, nRF Bluetooth Low Energy (BLE) communication, and USB-C configuration channel (CC) control
- Carried out electrical Root Cause Analysis of latent device failures by performing comprehensive subsystem testing in the lab
- Supported cost-down and optimization initiatives by evaluating alternative components on cost, efficiency, power, and footprint

**Hardware Systems Engineering Intern | Zoox (Amazon's Robotaxi)** May - Aug 2024 | Foster City, CA, USA

- Integrated a Linux-based manufacturing asset with CAN, 100Base-T1, and GMSL2 interfacing to communicate with drive module ECUs, LiDAR, Radar, and camera sensors and enable the parallel firmware flashing of 30+ unique vehicle controllers
- Developed CAN/UDS tools in Python to activate a vehicle control unit at manufacturing EOL, reducing its deployment time by 10
- Used Vector Network Analyzers, oscilloscopes, and waveform generators for PCBA bring-up and high-speed characterization
- Designed 2-6 layer PCBAs using LTspice with schematic capture and PCB layout in Altium for low speed, 100Base-T1 automotive ethernet, and GMSL2 video communication with STM32, I2C, UART, JTAG, and USB(2.0) integration

**Robotics Engineering Intern | Medra (\$52 million Series A)** Jan - Apr & Sep - Dec 2023 | San Francisco, CA, USA

- Designed automation systems with a 7-DOF robot arm for bio-labs as the startup's 9th hire
- Validated an ESP32 PCBA with Bluetooth Low Energy communication and UART to RS232 emulation using logic analyzers and oscilloscopes, and developed middleware in Python to integrate the hardware into the robot's autonomous software stack
- Created a robotics simulation stack and integrated sim tests in CircleCI to add motion tests to the code deployment process

## Technical Projects

### iPhone-based Open Source Autonomous Mobile Robot

Turning an iPhone into a mobile robot with custom robot hardware with BLE communication and BLDC motors with FOC control

### Automatic Self-Balancing 3-DOF Stewart Platform

Designed a robot to balance and move a ball in roll, pitch, and z with Raspberry Pi, Arduino, stepper motors, and OpenCV