Eric **Turner**

2A Mechatronics

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Work Experience

Undergraduate Research Assistant — *Waterloo, Ontario*

University of Waterloo with Dr. Nishida — *Jan 2025 - Dec 2025*

- Used ESP32 to communicate with low cost air quality sensors through I2C and UART. Collected data was sent in real time to a google sheet through HTTPS requests to the Google Cloud APIs.
- Analyzed and compared cooking emission data gathered from low cost sensors with data from high end sensors.

CAD/CAM Programmer — *Markham, Ontario*

Sable Metal Fabrication — *Sep 2024 - Dec 2024*

- Created CAD models, drawings, and work instructions for manufacturing.
- Optimized designs for manufacturability and nested sheet metal parts for laser cutting.
- Led the design and construction of a mezzanine storage system, sourcing key components.
- Developed custom sheet metal and 3D-printed solutions, including welding fume hoods and assembly jigs.

Engineering Analyst — *Brampton, Ontario*

A. Berger Precision — *Jan 2024 - Apr 2024*

- Automated inspection using an optical micrometer, cutting cycle time by 50%.
- Conducted continuous improvement studies, improving process throughput by 13%.
- Created SolidWorks models and drawings from customer prints to ensure accurate manufacturing specifications.
- Evaluated an automated inspection system integrating robotics and AI vision.
- Designed and 3D-printed inspection fixtures and tooling for production.

Member of Accumulator & Powertrain team — *Waterloo, Ontario*

Formula Electric Design Team — *Sep 2023 - Ongoing*

- Designed a sheet metal shroud using Solidworks to prevent water from entering the battery while allowing sufficient airflow through the battery to cool the cells.
- Designed and prototyped custom 3D printed mounts for integrating electrical components within the lid of the accumulator, ensuring precise fitment and optimal functionality.

Projects

Wireless Environment Monitoring Sensor

Personal Project — *Nov 2024 - Jan 2025*

- Designed and developed a custom circuit board using Altium Designer for schematic and PCB layout. Optimized design for cost, power efficiency and compact footprint.
- Integrated ESP32-C6 microcontroller with firmware written in C to interface with three sensors using I2C communication. Wrote and debugged sensor libraries.
- Enabled real time data monitoring using MQTT to post information to the cloud via the onboard WiFi network.
- Achieved high power efficiency through a buck converter and deep sleep mode, extending battery life significantly.

Automated Billiards Robot — *Waterloo, Ontario*

School Project — *Oct 2023 - Dec 2023*

- Engineered a worm gear drive system to efficiently charge and launch a steel machined pool cue, ensuring consistent and powerful ball striking.
- Designed the control system using Lego EV3 and firmware written in C.
- Implemented an ultrasonic sensor to locate robot position relative to corner pockets.

Skills

Programming	Python, C/C++, VHDL, MATLAB, PLC(Ladder).
Tools	3D printing, Soldering, Lathe, Mill, Drill Press, Gauging, Spot Welder, Oscilloscope, DMM.
Software	SolidWorks, Altium, Fusion 360, AutoCAD, Microsoft 365, ANSYS Discovery, Quartus Prime, LTspice.
Microcontrollers	Arduino, Raspberry Pi, ESP32.

Education

University of Waterloo — *Waterloo, Ontario*

BASc in Mechatronics Engineering — *Sept 2023 - Expected Apr 2028*

- Overall GPA of 3.98
- Dean's List in 1B term