

# Jason Baik

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## EDUCATION

### McMaster University

Bachelor of Engineering - Electrical Engineering (Co-op)

Hamilton, ON

Sept. 2023 – May 2028

## EXPERIENCE

### Solar Cells Hardware Specialist

McMaster Solar Car Project

Oct. 2025 – Present

Hamilton, ON

- Redesigned the bypass diode PCB from schematic to assembly, performing functional validation and integrating it with cell modules.
- Configured and wired solar cells with Maximum Power Point Trackers (MPPT) to optimize power output under varying conditions.
- Tested and replaced underperforming solar cell modules to improve array efficiency and reliability.

### Technical Instructor Intern

The STEAM Project

May 2025 – Aug. 2025

Richmond Hill, ON

- Developed projects and produced scalable kits via CAD, laser cutting, and 3D printing.
- Built demo units and improved assembly reliability and documentation for student-ready hardware.
- Mentored 50+ students on microcontroller programming, debugging, and mechanical assembly in a makerspace.

## RELEVANT COURSEWORK

- |                                   |                                  |                       |
|-----------------------------------|----------------------------------|-----------------------|
| • Microprocessor Systems          | • Logic Design                   | • Signals and Systems |
| • Electronic Devices and Circuits | • Data Structures and Algorithms | • Machine Learning    |

## PROJECTS

### Embedded Mapping System | C, MATLAB, Assembly

Jan. 2025 – Apr. 2025

- Engineered a 3D room-mapping system enabling automated 360° scans, using an MSP432E401Y microcontroller and time-of-flight sensor via stepper motor control.
- Integrated I2C for sensor data acquisition and UART for data transfer using C and Assembly.
- Simulated spatial data, visualizing the features of the scan using MATLAB.
- Optimized system limitations, achieving a maximum quantization error of 1mm, ensuring high-fidelity spatial mapping under real-time data constraints.

### Autonomous Motor Controlled System | C++, Arduino, PID Tuning

May 2025 – Sept. 2025

- Designed and implemented a motor control architecture using an H-bridge motor driver and an ESP32 to actuate a flag in response to a UWB's proximity to one of the fixed anchors.
- Implemented PID feedback loop tuned via encoder and UWB sensor data, achieving a 6.8Mbps data rate for precision tracking in Arduino.
- Integrated high-current motor control circuitry with voltage regulation via buck converters, validating safe current delivery and thermal limits under full-load operation.
- Implemented embedded C++ firmware, driving real-time PWM control and direction logic with interrupt-driven encoder sampling and UART debugging interface.

## TECHNICAL SKILLS

**Languages:** C, C++, Python, Assembly, Verilog, VHDL, MATLAB, HTML, CSS, R

**Developer Tools:** Git, GitHub, Visual Studio Code, Jupyter Notebook

**Embedded and Hardware Tools:** Arduino IDE, Logic Analyzers, Oscilloscope, Multimeter

**Design and Simulation Tools:** Altium Designer, LTspice, PSpice, Simulink, Fusion 360, Autodesk Inventor

**Libraries and Frameworks:** NumPy, Pandas, Matplotlib, TensorFlow, Scikit-Learn, PySerial