

# 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

Oct. 2025 – Present

*McMaster Solar Car Project*

*Hamilton, ON*

- Redesigned the bypass diode PCB in Altium Designer, optimizing the layout to reduce the effective area used by 35% and performing functional validation and integrating it with cell modules.
- Programmed firmware on the current sense board to improve current-reading stability by 40%+ through filtered zero-offset calibration for an ESP32 microcontroller.
- Tested and replaced underperforming solar cell modules to enhance array efficiency using a multimeter, increasing output by 33%+.

### Technical Instructor Intern

May 2025 – Aug. 2025

*The STEAM Project*

*Richmond Hill, ON*

- Created scalable hardware kits through CAD, laser cutting, and 3D printing, improving production consistency and effectively reducing iteration time by 30%.
- Developed and validated demo units, rewrote assembly guides that cut troubleshooting time for instructors by an estimated 60% to increase productivity.
- Supported 50+ students in embedded programming and mechanical design, achieving a 95% project-completion rate across workshops.

## PROJECTS

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

May 2025 – Sept. 2025

- 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 buck converters, improving power conversion efficiency by approximately 25% and validating safe current delivery under full-load thermal limits.
- Combined UWB range measurements with encoder feedback, improving dynamic positional accuracy by 45%+ and stabilized motion tracking across varying speeds.
- Implemented embedded C++ firmware, driving real-time PWM control and direction logic with interrupt-driven encoder sampling, reducing control-loop latency by 40%+ and improving system responsiveness.

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

Jan. 2025 – Apr. 2025

- Engineered a 3D room-mapping system enabling automated 360° scans, using an MSP432E401Y microcontroller, reducing user input by 98.4%
- 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 in real time.

### Snake Game | C++, Data Structures

Jan. 2025 – Apr. 2025

- Developed an object-oriented C++ implementation of the classic Snake game with a modular architecture supporting flexible updates and debugging.
- Integrated advanced data structures (BSTs, hash tables, linked lists) to optimize game logic, collision handling, and runtime efficiency by 50%+.
- Engineered memory-efficient systems and collision-resistant hash tables, enhancing performance and stability during gameplay.

## 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