Jason Baik

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Education

McMaster University | Expected Graduation: **May 2028**   **Hamilton, ON**

Electrical Engineering
- Cumulative GPA: 3.42/4.0

Project Experience

LiDAR Mapping System   **Hamilton, ON**
- Engineered a 3D room-mapping system enabling automated 360° scans, using an MSP432E401Y microcontroller and VL53L1X 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 including FPU rounding errors, stepper motor delays, and serial transmission constraints, achieving a maximum quantization error of 1mm, ensuring high-fidelity spatial mapping under real-time data constraints.

Closed-Loop Motor Controlled System   **Richmond Hill, ON**
- 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.

Analog Amplifier   **Hamilton, ON**
- Designed and implemented a common collector BJT amplifier with <10% signal attenuation using NPN and PNP integrated circuits.
- Simulated and validated amplifier, confirming a frequency response above 100 Hz and linearity using LTSpice.
- Constructed and tested the physical circuit, verifying close agreement between simulated and real-world performance using oscilloscope measurements and demonstrating superior gain compared to theoretical estimates.

Web Scraper Bus Time Display   **Richmond H, ON**
- Programmed an Arduino microcontroller to control an LCD display module, to dynamically update and display the quickest bus arrival times.
- Automated real-time data acquisition accomplishing ±30s accuracy using from Google Maps via Python libraires such as Selenium and PySerial.
- Developed data processing and communication protocols to format and transfer schedule data seamlessly from Python to Arduino via UART.

Experience

Instructor - Co-op Position   **Richmond Hill, ON**
The STEAM Project   *May 2025 – August 2025*
- Designed student projects optimized for scalable production using laser cutting and 3D printing.
- Guided students through hands-on projects using tools like CAD software, 3D printers, robotics, and woodworking tools, promoting practical problem-solving in a creative makerspace environment.
- Taught coding, python, robotics, and microcontroller programming using platforms such as Arduino and robotics kits.

Skills

Programming Languages: C, C++, Python, Assembly, Verilog, VHDL, HTML, CSS, R
Design & Simulation Tools: LTspice, PSpice, MATLAB, Simulink, Fusion 360, Autodesk Inventor
Software: Microsoft Suite, Github, VSCode, Arduino, Quanser Labs, Cura
Technical Skills: Soldering, 3D Printing, Welding, Oscilloscope Measurement, Mechanical Assembly