Logan Hartford

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Skills

- **Electrical:** Altium Designer, PDN Analyzer, High-Speed Routing, Power-Converter Design, SaturnPCB
- **Programming:** Python, C/C++, JavaScript, PlatformIO, STM32, MPLABX, PIC, Arduino, HTML/CSS, , Jekyll
- **Mechanical:** SolidWorks, Matlab, Simulink, Weldments, 3D Printing, AutoCAD, CNC Machining

Work History

Robotic Electrical System Integration, Tesla Bot | Tesla, Inc. September 2023 - December 2023
- Led electrical system integration for data collection platforms and developed test protocols to assess efficacy.
- Developed the repair process for robotic hands, improving efficiency and increasing yield from 50% to 95%.
- Implemented software-driven hardware validation tests for robotic hands, reducing issue triage time by 75%.

Cell Manufacturing Engineering, Can Stamping | Tesla, Inc. January 2023 - April 2023
- Automated data collection and aggregation with Python to aid in a project to reduce equipment downtime.
- Designed an assembly to position sensors/actuators on a high-volume production line, improving reliability 15%.
- Recovered tooling measurement data from PDFs using Python, enabling the analysis of tool lifespan trends.

Robotic Hardware Design & Firmware | EMR Laboratories Inc. May 2022 - December 2022
- Worked directly with the client to identify project requirements and deliver the final design used in a sewer robot.
- Integrated an Nvidia Jetson, motor controllers and a fiber-to-ethernet converter into a single PCB.
- Reduced the footprint of the board by 60% via BOM changes, and moving to 8-layers and a two-sided design.
- Designed a 4S Li-Ion BMS, developed the firmware and prototyped a charger that enabled in-bot charging.

Consumer Hardware Design & Firmware | EMR Laboratories Inc. September 2021 - April 2022
- Designed a low-cost, low-power safety device for workers at height to reduce injuries during boom lift operation.
- Built a test lift to simulate real-world usage and collect data used to optimize the device performance.
- Increased the device's battery life from 20 to 128 days through math optimizations and device configurations.

Design Teams

Electrical Lead, Team Lead | University of Waterloo Robotics Team September 2021 - Present
- Managed team direction, project coordination, and sub-team integration through multiple design cycles.
- Coordinated the electrical team and provided mentorship to new members throughout their PCB designs.
- Revamped the power distribution board, cut the design cycle time by 50%, reduced the footprint by 65%, and achieved the first successful implementation.

Projects

CheatScore *Python, Google Places API, Kaggle Data*
- An app to help you quantify and satisfy your cravings by finding nearby restaurants and comparing meals.
- The app visualizes the nutritional content of the meals for more informed, indulgent decision-making.

A PCB Christmas *Altium, MPLAB X, C++*
- An electronic Christmas ornament that lights up and plays songs I made for my friends and family.
- Created a Christmas tree PCB with a 7x7 LED matrix and piezo buzzer for playing and flashing songs.

Beer Can Counter *Arduino, SolidWorks, 3D Printing, C++*
- A device to count your empties and keep track of your refund money.
- Using a laser, photo-resistor, and Arduino to count and display the number of cans passing through.

Education

University of Waterloo September 2020 - May 2025
BASc Mechanical Engineering · Mechatronics Option
- **Mech Design:** Adequacy assessment and synthesis of machine elements with a focus on the design process.
- **Embedded Systems:** Synchronization and data flow; interfacing to sensors and actuators; microprocessor system architecture, parallel, serial, and analog interfacing; buses; direct memory access.
- **Controls Sytems:** Open loop and feedback control. Analysis of control systems using block diagram algebra, transient and steady-state operation.