

Marcus Finlay

Mechatronics Engineering Student

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EDUCATION

McMaster University

Bachelor of Engineering, Mechatronics Engineering, Co-op

Cumulative GPA: 3.8 /4.0

Expected Graduation: April 2029

WORK EXPERIENCE

Superior Boiler Works & Welding Ltd.

Mechanical Engineering Intern

May 2025 - Aug 2025

Stoney Creek, ON

- Created 3D models and production drawings using Autodesk Inventor to fabricate pressure vessels and storage tanks.
- Attended project management meetings and design reviews to better understand the engineering design process.
- Collaborated with a team of engineers and fabricators to incorporate manufacturing feedback into production drawings.
- Planned a certification weight test for a pressure vessel and presented the proposed approach during project meetings.
- Performed and reviewed pressure vessel calculations using COMPRESS to ensure compliance with ASME code.
- Prepared engineering reports and maintained revision sheets to track changes across design iterations.

Stoney Creek Furniture

Warehouse Assistant

Jun 2022 - Aug 2024

Stoney Creek, ON

- Built furniture using a variety of hand and power tools to prepare for customer pickups and deliveries.
- Operated forklifts to access furniture stored within the racks of the warehouse.
- Utilized various waste compactors to control the waste from opening product in the warehouse.

PROJECTS

Self-Balancing Robot | C++, ESP32, PID Control, Sensors, Encoders

- Designed and built a two-wheeled robot that maintains its own balance. Used an ESP32, a custom chassis, tilt sensors, motors, encoders, and control electronics.
- Developed a C++ program that reads sensor data and uses PID control to keep the robot from falling over.
- Implemented wireless phone control using a WebSocket server to send driving and steering commands to the robot.
- Tracked down the cause of system failures, using a digital multimeter to test each part separately.

Wearable Obstacle Detector | Distance Sensors, Haptics, Prototyping

- Built a wearable prototype using angled distance sensors and haptic feedback to help a client with hearing and peripheral vision loss navigate their surroundings.
- Led the project team by delegating tasks, coordinating timelines, and communicating progress to keep the project on schedule.
- Presented the prototype through a live demonstration, showing how its accessibility features addressed the client's needs.
- Compared different sensing options and refined sensor placement to improve obstacle detection.
- Tuned haptic feedback to provide intuitive obstacle alerts without relying on visual or auditory cues.

Image Processor | C++, Object-Oriented Programming

- Developed an image processor using C++ to explore filtering algorithms and image processing techniques.
- Organized image storage and file handling into reusable C++ classes to simplify adding new filters as development continues.

SKILLS

Programming & Controls: C++, Python, Arduino, PID Control, Embedded Systems, Image Processing

CAD & Engineering: Autodesk Inventor, AutoCAD, COMPRESS, MATLAB

Hardware & Tools: ESP32, IMUs, Encoders, DC Motors, Motor Drivers, Sensors, Soldering, 3D Printing, Hand and Power Tools

Technical Interests: PLC/HMI Programming, Industrial Robotics, Machine Vision, Manufacturing Automation

Professional: Microsoft Office (Excel, Word, PowerPoint), Technical Documentation, Presentations, Project Coordination