

Ryan Chang

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EDUCATION

McMaster University, Hamilton, ON

Expected Graduation: 2029

Candidate for Bachelor of Electrical Engineering and Biomedical Engineering, Co-Op

- CGPA: 3.98/4.00
- Relevant Courses: Data Structures & Algorithms, Circuit Analysis, Electromagnetism, Principles of Programming
- Awards: NSERC Undergraduate Student Research Award, Dean's Honor Roll, Engineering Award of Excellence

EXPERIENCE

Software Development Intern

Nov. 2025 – Present

PatientCompanion

Waterloo, ON

- Engineered a Python-based optical character recognition scraping solution that automated the extraction of critical contact information (names, emails) from over **300+ image-based records**.
- Engineered a toggleable, continuous voice detection feature within the **React Native** application using **Azure Speech API**. This upgrade replaced the previous, always-on setup by delivering explicit user control to initiate and terminate real-time voice detection.

Machine Learning Research Intern (NSERC)

May 2025 – Sept. 2025

McMaster University, Supervisor: Dr. Thomas Doyle

Hamilton, ON

- Designed and deployed an optimized Human Activity Recognition system on a **Raspberry Pi**, enabling continuous classification of 6 activities via **2.56-second** data windows on the edge.
- Engineered **end-to-end data pipelines** in **Python (NumPy, Pandas, SciPy)** to preprocess raw time-series sensor data, transforming **50K+ windows** from **10+ datasets** into supervised learning formats.
- Developed **PyTorch FFNN** models, achieving **96%** within-participant and a **92%** cross-dataset accuracy.
- Architected and deployed a scalable **IoT pipeline** using **AWS IoT Core, Lambda, and S3** for low-latency inference and secure, persistent storage.

PROJECTS

Carpet Type Image Classification | Python |

- Designed and deployed an automated ML pipeline for industrial quality assurance, performing real-time classification of 4 distinct carpet types, achieving **82.2%** accuracy
- Preprocessed **7K+ images** with YOLOv1 and Python to segment and crop carpet regions for cleaner inputs.

McMaster SumoBot | C++, Arduino, Embedded

- Collaborated in a technical team to build an **autonomous fighting robot**, winning **10+** competition battles.
- Designed **C++ algorithms** for real-time autonomous movement and opponent detection.
- Integrated data from **Arduino, ultrasonic, and infrared sensors** for responsive control.

Snake Game (C++ OOD Design) | C++

- Architected a modular C++ game using OOD principles and dynamic arrays for real-time state management
- Developed core mechanics including snake movement, growth logic, food generation, and collision detection.
- Optimized object lifecycles and manual memory management to ensure stable and leak-free gameplay.

EXTRACURRICULARS

Graphic Designer & Outreach Member

Dec. 2024 – Apr. 2025

McMaster Exoskeleton Team

Hamilton, ON

- Designed Instagram content in Photoshop (5+ hrs/week), growing reach to 10K+ views and 500+ followers.
- Initiated outreach to potential sponsors via email, contributing to over \$100,000 in sponsorship funding.

TECHNICAL SKILLS

Languages: Python, JavaScript, HTML/CSS, C++, C, Arduino, MATLAB

Developer Tools: VS Code, Google Colab, Git, GitHub, Figma, Autodesk Inventor, OnShape, AWS, Raspberry Pi

Libraries: PyTorch, Numpy, Scikit-Learn, Matplotlib, Pandas

Laboratory Skills: Oscilloscopes, Signal Generator, Multimeter