Isaac Doyle

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Education

McMaster University Hamilton, ON

Bachelor of Engineering in Software Engineering *Expected Grad: 2028*

- Data Structures and Algorithms, Embedded Systems, Digital Logic Design, Object-Oriented Programming, Systems Programming (C)

Projects

MindTrace | *HTML, JavaScript, CSS, MongoDB, Node.js + Express, JWT auth* January 2026

- Built a full-stack mental health tracking web app that lets users sign in and log daily mood, energy, stress, and sleep.
- Designed and implemented JWT-based authentication with password hashing (bcryptjs) to secure user access.
- Modeled user and log data in MongoDB using Mongoose schemas and delivered CRUD routes for entries.
- Implemented API middleware for auth/validation and enabled CORS for safe client-server communication.
- Created a responsive UI in HTML/CSS with client-side logic for login and data interactions.

Leaf-Watch | *React, JavaScript, Leaflet, Python, scikit-learn, Pandas, NumPy* November 2025

- Developed a full-stack web application that visualizes global deforestation trends using an interactive Leaflet map and real-time environmental data.
- Implemented machine learning models in Python (scikit-learn) to predict future deforestation risk areas based on historical land-use and climate data.
- Integrated the ML backend with the frontend via REST APIs, enabling real-time visualization of prediction results and environmental impact metrics.

ATMS | *C++, Python, Arduino, PlatformIO, Linux, NumPy, Matplotlib* July 2025

- Built a real-time automated thermal control system using PID algorithms in C++ to stabilize CPU/GPU temperatures.
- Utilized Arduino and PlatformIO to collect temperature data via thermistors and control fan PWM outputs.
- Automated data logging and analysis in Python using NumPy and Matplotlib for visualization.
- Optimized cooling efficiency, reducing thermal variance by **22%**

RF Diagnostics Tool | *C, C++, Arduino, PlatformIO* May 2025

- Designed and programmed an RF device using an ESP32 and NRF24L01+PA+LNA Module to analyze 2.4GHz signals under stress.
- Prototyped a custom wireless diagnostics tool to visualize signal strength, packet errors, and frequency interference patterns in real time.

EchoSense | *C++, Python, Arduino, PlatformIO, Linux, NumPy, Matplotlib* April 2025

- Developed a wearable assistive device using an ESP32 and ultrasonic sensors to detect obstacles for visually impaired users.
- Handled distance measurement in real time, and used PWM (Pulse Width Modulation) to generate audio feedback when needed.
- Analyzed sensor data and plotted detection accuracy using NumPy and Matplotlib.

Technical Skills

Languages: Python, Java, C, C++, Bash, JavaScript
Frameworks: Arduino, PlatformIO, React, Node.js, Express
Databases: MongoDB
Developer Tools: Linux, Git, GitHub
Libraries: Pandas, NumPy, Matplotlib, Scikit-learn
Hardware/Embedded: ESP32, NRF24L01, Ultrasonic Sensors, Thermistors