

# MARTIN SIT

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## EDUCATION

### University of Waterloo

Honours Bachelor of Computer Science, Co-op

4.0/4.0 GPA

Sep 2024 – May 2029

## PROFESSIONAL EXPERIENCE

### Machine Learning Research Intern | Python, MATLAB, TensorFlow, Keras

Jul 2023 – Aug 2023

Sunnybrook Research Institute

Toronto, ON

- Engineered a 3D convolutional neural network (CNN) to optimize FUS treatment monitoring, enabling real-time analysis
- Achieved a **46x** speed improvement with **0.99** ICC, enabling ultra-fast image reconstruction approximations
- Generated synthetic radio frequency image datasets for ML training, expanding training data by **50%**
- Conducted research on advanced DNN architectures (U-Net, ResNet, DenseNet) and implemented key findings

### Cybersecurity Research Intern | Python, Flask, PyAutoGUI, Networking, Linux

Oct 2022 – Jul 2023

University of Waterloo

Waterloo, ON

- Architected a GUI automation system to collect over **20** GB of TCP/IP packet data from video conferencing calls
- Scraped and processed **100+** hours of video data to curate a robust dataset for ML model training
- Presented papers on traffic fingerprinting and censorship-resistant internet communications

## PROJECTS

[see more projects here](#) 🔗

### 🔗 EcoRewards – Mobile Rewards App | Remix, React, Express.js, PostgreSQL, Tailwind CSS, GPT-4, NFC

- Developed a mobile app using Remix and React to reward eco-friendly purchases, with AI-powered receipt scanning
- Designed the backend using Express.js and PostgreSQL, enabling seamless processing and classification of receipt data
- Won RBC's **1st Place (\$1,200) prize** out of **842** participants at Hack the North 2024, Canada's largest hackathon

### 🔗 LiteNet – Neural Network Framework With 0 Dependencies | C++

- Built a C++ deep learning framework, with a user-friendly API based on PyTorch and Tensorflow Keras
- Implemented all algorithms (i.e. backpropagation) as well as the underlying linear algebra operations from scratch
- Used the framework to create an image classifier model for the MNIST dataset with **94%** testing accuracy

### 🔗 Credibility – AI Research Assistant | Python, JavaScript, React, Next.js, Tailwind CSS, Flask, Selenium, GPT-4o

- Developed a web-based research tool that uses LLMs and key metrics to assess the credibility of websites
- Architected an analysis engine based on **10+** metrics such as publisher reputation, bias, sentiment, and traffic rank
- Leveraged GPT-4o and Selenium for automated multimodal evaluation of website content and UI

### 🔗 Kaleidoscope – Emotion/Irony Assistive Technology for Autism | Python, JavaScript, PyTorch, Flask, WebExtensions

- Engineered an ML-based application to provide emotion/irony recognition for individuals with ASD
- Trained BERT-based LLMs on **60k** Tweets and Reddit comments via transfer learning
- Achieved **89%** and **96%** accuracy on emotion and irony detection models, respectively
- Built a Flask-based backend API to serve model inference at millisecond latency

### 🔗 Sensai – Computer Vision Workout Coach | Python, JavaScript, Vue.js, Nuxt, Flask, OpenCV, Mediapipe, SocketIO, JWT

- Created a full-stack fitness platform, delivering real-time AI feedback with **<100ms** latency for live camera input
- Engineered the backend API with Flask and SocketIO for streaming pose calculations from OpenCV/Mediapipe
- Implemented secure user authentication with JWT and managed user sessions and data with MongoDB

## OTHER EXPERIENCE

### Hackathon Organizer – Web/Tech Head | React, Next.js, Tailwind CSS, MongoDB

Aug 2022 – Aug 2024

JAMHacks 🔗

Waterloo, ON

- Led redesign for event website with React and Next.js, improving UX for **700+** newly registered users
- Re-engineered the MongoDB storage system, reducing file retrieval times by **60x** through dynamic aggregation
- Built QR code-based attendance system for workshops, streamlining check-ins for **180+** participants

## SKILLS

**Languages:** Python, C++, Java, JavaScript, TypeScript, SQL, Go, Racket, HTML5, CSS3

**Technologies:** Flask, React, Express.js, Node.js, Next.js, Vue.js, Tailwind CSS, PyTorch, Tensorflow

**Development Tools:** Git, Bash, Linux, MongoDB, PostgreSQL, Firebase, AWS (Certified Cloud Practitioner 🔗)