

Warrick Tsui

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<https://warrickt.github.io/WarrickTsuiPortfolio/>

Motivated and innovative Computer Engineering Student with 4+ years of programming experience. Full-stack developer with passion in web development and AI.

Education

Bachelor's of Applied Science and Engineering in Computer Engineering + PEY Co-op

University of Toronto
September 2023 - April 2028 (Expected)

Dean's List Scholar | Top 30 Academic Standing in Electrical and Computer Engineering | 94% Average

Technical Skills

Languages: Python | Java | C | C++ | JavaScript | TypeScript | HTML | CSS | MATLAB

Tools: PyTorch | SpaCy | Docker | Pinecone | React | Node.js | Express.js | Pandas | SQL | PostgreSQL | PyTorch | OOP | Web APIs | Firebase | Flask | Selenium | Git |

Work Experience

Undergraduate RAG Researcher

Apr. 2025 - Present

University of Toronto Department of Electrical and Computer Engineering (Under Prof. Salma Emara)

- Maintaining a **Retrieval-Augmented Generation (RAG) pipeline** for an AI teaching assistant using course materials (PDFs, textbook, and websites) used by **1000+** students across **5+ Engineering Courses**
- Building **multi-modal document indices** using **LlamaIndex** and embedded content via GPT-4o prompts
- Utilizing vector database tools like **Pinecone**, **ElasticSearch** to implement Pinecone vector search and keyword-based search for recall of course documents during chats
- Integrated **Cohere-based reranking** and **GPT API** enhance the context and output generation relevance

ML Developer

Feb. 2025 - May 2025

University of Toronto Trustworthy Machine Intelligence Team (TMI), Toronto, ON

- Trained **XLS-R** model and wrote test implementation **PyTorch** scripts for Deepfake Audio Detection
- Extracted **time-frequency resolutions** using **Numpy** to construct multi-resolution spectrograms

Backend Software Developer

Jan. 2025 - Present

University of Toronto Creative Computing Association (UTCCA), Toronto, ON

- Training ML-based ambient music generator using **PyTorch** in a backend developer team of 10
- Implemented **data augmentation** techniques like time-stretching and pitch-shifting to train ML model

Software Developer

Jan. 2025 - Apr 2025

University of Toronto Engineering Student Consulting Association (UTESCA), Toronto, ON

- Developed a custom **Stock Trading Chart** using **TradingView API** on **React**, **Pandas**, and **Node.js**
- Successfully displayed **backtesting mechanisms** of up to **5 years** on an investment firm website

Projects

Sinker - Hack Canada Best Google Build with AI Hack

February 2025

- Utilized **Next.js** and **Material UI** to construct Frontend UI of cybersecurity simulation testing platform
- Handled **PostgreSQL** database queries using **Prisma ORM** to encrypt and store user data
- Implemented personalized, simulated phishing attempts to backend users using **Gemini API**

Deervolution - DeerHacks IV 2nd Place Overall

February 2025

- Helped construct a Front-end UI using **TypeScript** and **React Native** to build a mobile game application promoting outdoor activities after building a prototype with **Figma**
- Utilized **Supabase** and **OAuth2** to implement user login authentication and database allocation
- Successfully handled **HTTP requests** between **Node.js** server and frontend using **Express.js**

ReliefGrid - NewHacks Hackathon Project

November 2024

- Create a web application easing natural disaster resource management in a team of 4
- Implemented real-time data synchronization for resource management using **Firebase** and **JavaScript**