

Patrick He

✉ he.patrick2005@gmail.com 🌐 patrickhe.com 🗣 he-patrick 📺 in/patrickhe2005

SKILLS

- **Languages:** C++, Python, Java, Javascript, HTML, CSS, TypeScript, PHP, SQL
- **Technologies:** React.js, Next.js, Node.js, Angular, Laravel, Arduino, OpenCV
- **Tools:** Git, MySQL, PostgreSQL, Firebase, Heroku, Vercel, AWS S3

EXPERIENCE

Canada Revenue Agency

May 2024 – Aug. 2024

Incoming Software Engineering Intern

Sharkbyte

Jul. 2023 – Aug. 2023

Software Engineering Intern

Ottawa, ON

- Created a full stack application with the **PHP** web framework **Laravel** to assist high school students accessing events and announcements
- Programmed an automated event scheduling system by integrating **Google Sheets API** to capture announcement requests from teachers, seamlessly syncing with **Google Calendar API** to populate a calendar
- Integrated caching and webhooks to reduce API calls by up to **95%**
- Strategically deployed **AWS S3 buckets** for scalable and efficient image storage, significantly **reducing server load**, and resulting in a **17% improvement in website load times**

Electrium

Dec. 2023 – Present

Firmware Team Lead (Dutch Bike)

Waterloo, ON

- Architected a fully custom electric bicycle capable of reaching **speeds of 45 km/h** with a **range of 8 km**
- Programmed in **Arduino** with **C++** to intercept data from VESC-compatible motor with **ESP32**
- Engineered a display module to display speed, battery, and power data using **I2C communication**

PROJECTS

Basic Web Development Compiler 🗣 📄 | *TypeScript, Javascript, HTML*

- Programmed a **compiler** and runtime for the BASIC language in **TypeScript** to build interactive web programs
- Implemented features found in **React.js** such as DOM nodes, handle events, and bind data
- Placed **2nd out of 400+** participants at UofTHacks

Sign Language Translator 🗣 📄 | *Next.js, TypeScript, Tailwind CSS, OpenCV, Mediapipe, Scikit-learn, Python*

- Deployed a **Next.js** web application capable of translating sign language to text and converting this text into multidirectional sign languages
- Utilized **OpenCV** to enable computer vision for data collection and **Mediapipe** to detect **21** hand coordinates
- Applied the **scikit-learn Python** library to train **2600+** sign language data points to specific letter classifications

Cam-Tag Weapon Detector 🗣 📄 | *Teachable Machine API, Javascript*

- Created a product prototype of a backpack-mounted camera, designed to identify potential threats in the form of weapon-carrying individuals and alert users through an alarm
- Trained an **ML model** with over **10 000 data points** to detect weapons through a camera
- Pitched the startup idea at **Toronto Metropolitan University**, placing **1st in a design competition**

EDUCATION

University of Waterloo

Sep. 2023 – May 2028

Candidate for BSc in Computer Engineering

Waterloo, ON