

# Thomas Vu

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## Education

### UNIVERSITY OF WESTERN ONTARIO

London, Ontario

Bachelor of Science in Computer Science (GPA: 3.8+)

## Projects

### DOCTALK | React, Nodejs, MongoDB, Tailwind CSS

Ignition Hacks 2024

- Developed a web application to assist doctors in **recording**, **transcribing**, and **summarizing** conversations with patients, aiding in critical decision-making
- Built the frontend using **React** and **Tailwind**, with **Node.js** and **Express.js** backend connected to **MongoDB** database
- Implemented **secure** authentication and authorization using **JWT tokens**, ensuring only authorized users can access the app, with **session persistence** and **automatic logout** for enhanced security
- Integrated **AI** to accurately **transcribe** conversations, identify speakers, and **summarize** key points for better analysis
- Automated the **generation** of PDFs containing essential patient information for easy access by doctors

### PROGRAMMING LANGUAGE DEVELOPMENT: INTERPRETER AND VM | Java, C

Ongoing Project

- Developed a custom programming language named Lox, following a step-by-step approach from the book *Crafting Interpreters* by Robert Nystrom, to gain a deep understanding of language design and implementation
- Created an **interpreter** in **Java** to handle key concepts such as grammar definition, syntax scanning, parsing, control flow, functions, and classes, enabling comprehensive exploration of high-level language features
- Designed and built a **bytecode virtual machine** in **C**, focusing on low-level constructs like compiling expressions, memory management, garbage collection, and optimization techniques
- Implemented **advanced programming concepts** including inheritance, binding methods, variable scoping, and efficient string handling in **Java** and **C**, emphasizing hands-on experience with both high-level and low-level programming paradigms

### GO FUND US | React.js, Rust, Cairo

Hack Western 11 Winner

- Designed and developed **Go Fund Us**, a decentralized application that simplifies fund management using **blockchain**
- Leveraged blockchain technology for scalability to create a DAO-like **fund manager** focused on transparency, accessibility, and security
- Built a user-friendly interface in **React.js**, enabling seamless contributions for organizations, businesses, and individuals
- Implemented Rust-based smart contracts to ensure secure and transparent transactions, suitable for charity campaigns, organizational fund management, or group events
- Recognized for best use of Tempo Labs at Hack Western

### REAL-TIME CHAT APPLICATION | HTML, CSS, JavaScript, Django

Personal Project

- Developed a **real-time chat application** as a personal project, leveraging **HTML**, **CSS**, **JavaScript**, and **Django** framework
- Utilized Django web framework, coupled with pre-made **HTML** and **CSS** templates, ensure efficient front-end design
- Integrated **SQLite** database to store user data, chat-room information, and messages
- Implemented real-time communication features using **Ajax**

### COURSE DASHBOARD | HTML, CSS, JavaScript, Python

Hacks Western 9

- Integrated **web scraping** techniques to extract course information from the Western University website, including course details and PDFs of textbooks
- Utilized **Python** to fetch professor ratings and reviews from RateMyProf.Com, enhancing the dashboard's functionality and providing valuable insights to students
- Demonstrated full-stack development capabilities by combining front-end and back-end technologies to create a seamless and user-friendly dashboard for accessing course materials and professor information

### ELEMENTAL FLIP | Godot

LoJam (London Game Jam) 2024

- Collaborated with a team of 4 to develop a 2D action game in the **Godot** engine, implementing physics-based algorithms for **collision detection** between projectiles, players, enemies, and walls
- Utilized linear interpolation (**LERP**) to achieve smooth movement for projectiles and enemy characters
- Integrated sound effects and animations to enhance gameplay immersion
- Ensured **compatibility** with both keyboard and controller inputs for versatile user experience

## Skills and Interests

**Programming Languages:** C, C++, Java, Python, JavaScript, Lua, Bash

**Web Development:** HTML, CSS, Tailwind CSS, JavaScript, React.js, Express.js, Node.js, Django (Python), Vercel, Render

**Databases:** MySQL, SQLite, MongoDB, NoSQL

**Technologies:** Git, JUnit, Microsoft Office Suite, VS Code, Eclipse, IntelliJ IDEA, PyCharm, CLion, Godot Game Engine, Figma

**Additional Skills:** Active Learning, Team Collaboration, Project and Time Management, Strategic Thinking, Problem-Solving

**Interests:** Linux Distro Customization, Non-Fiction Reading, Human Psychology, Badminton, Mathematics