Alex Xu

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Projects

Online Multiplayer Platform (Prototype) **Firebase, Electron, React, TypeScript**

- Developed a **desktop application** that simplified the setup process for **port forwarding**, enabling easier access to multiplayer gaming through an innovative **Room System**.
- Utilized **Firebase Authentication**, **Firestore**, and **Realtime Database** for comprehensive account management, data storage, and *real-time communications*, such as *chat system* and *room listing*.
- Significantly **minimized** server-end network load to **nearly 0%** by implementing **PeerJS** to establish peer-to-peer (P2P) connections via **WebRTC**. Hosted a **TURN/STUN** server to ensure connectivity even when WebRTC is unavailable.
- Integrated **Microsoft login** for Minecraft, **automating** game downloads and mod loader configurations.
- Used **electron** with **React** to create a more *flexible* UI and **TypeScript** to enhance code *reliability* and *reduce errors*.
- Ultimately creates a **community**, enabling players from anywhere to connect, make friends, and play together.

Personal Portfolio Website (https://me.alex-xu.site/) **React, TypeScript, Nginx**

- Developed my personal portfolio website using **React** to effectively showcase my skills and projects.
- Hosted and deployed my portfolio on an **Oracle Cloud Ubuntu** server using **Nginx**, enabled **HTTPS** with **Certbot**.
- Used multiple libraries such as **framer motion** for more dynamic animations and **react-icons** to display icons.

D2L Backup Utilities **Django, Python, JavaScript**

- Leveraged **Django's ORM** to model the course structure on D2L, utilizing **Django's Admin features** to manage and filter course content effectively, including sections and files.
- Developed a **GraphQL API** using **graphene-django** to enable advanced and flexible data queries and mutations.
- Designed a *JavaScript* program that autonomously analyzes the structure of a D2L course from the Content page, outputting the structure with downloadable links in a nested JSON format.
- Created a *Python* script that utilizes nested JSON data generated by the *JavaScript* tool to download and populate all course data into the database via **Django's ORM**.

Decide4Me Backend **Firebase, Python, Flask**

- Developed an **MVP** within *24 hours* and won the *"Best Use of Cloud Computing"* Prize at YRHacks.
- Collaborated seamlessly with a frontend developer.
- Used **Flask** to build a **RESTful API** deployed on **Google Cloud Platform**. Utilizing **Firebase** for data storage and user authentication, ensuring *scalability* and *real-time data synchronization*.

Education

University of Waterloo **2023 - 2028**

Computer Engineering, Honours, Co-operative Program

Technical Skills

Languages: JavaScript, TypeScript, Python, Java, C, C++
Backend: Django, Firebase, Node.js, Flask
Frontend: React, Framer Motion, HTML, CSS, Bootstrap
Clouds & Databases: OCI, GCP, Firestore, Firebase Realtime Database, MongoDB, PostgreSQL
Web Technologies: Docker, Socket.IO, PeerJS, Three.js, Nginx, Cloudflare
Developer Tools: Intellij Idea, PyCharm, CLion, VS Code, GitHub

Honours and Awards

Canadian Computing Competition **2019 – 2023**

- Grade 11 & 12 Senior top 25%
- Grade 9 Junior (75/75)

YR Hacks **2020 – 2022**

Hackathon held by York Region District School Board

- Grade 11: Best Game
- Grade 10: Best Use of Cloud Computing

CanHack CTF **2022**

CanHack by the DMZ at Ryerson University

- School 2nd Place