Yijiashun(Elijah) Qi

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EDUCATION

University of Michigan — Ann Arbor, MI
Bachelor of Science - Computer Science and Data Science; GPA: 4.0/4.0 — *Sep 2021 - May 2024(expected)*

TECHNICAL SKILLS

Programming language: Python, HTML/CSS, JavaScript/Typescript, C++, SQL, Dart, R
Frameworks/Technologies: Dango, React, Next.JS, Vue.JS, LangChain, Flutter, Webpack, Hadoop
Developer Tools: Git, Relational Database, AWS, Docker, ChromaDB, PM2, MySQL, Linux

PROFESSIONAL EXPERIENCE

Asksia (A Generative AI Start Up) - Website: asksia.ai — Remote
Software Engineer — *Aug 2023 – present*

- Developed the back-end of a web application with 35 API endpoints utilizing **Django**, **PostgreSQL**, **Twilio**, and **Daphne**, which includes both **RESTFUL API** and **Websocket APIs**.
- Developed a **Next.js**-based web application frontend, enhanced with **TypeScript**, **Styled-components**, and **js-cookie**, supporting user registration, login, sample question trials, and an introductory tutorial.
- Reduced chatbot response time from an average of 4s to 0.5s by developing a **Streaming API** endpoint using **Server-Sent Events** for real-time AI chatbot interactions.
- Leveraged **LangChain** for retrieval-augmented generation; utilized **ChromaDB** for vector storage and embedded data splitting of AP US History content; and integrated **OpenAI's LLM** for query-based data retrieval and response generation.
- Created a customized **Django REST** framework Auth Class with **JWT** tokens dynamically restricts the daily question limit for users.
- Created a webhook to listen to payment events from **Stripe**, identified and resolved a critical Stripe integration bug, ensuring user can not use trial period multiple times, which reduced company loss by 20%.
- Improved the developer experience by integrating GitHub webhooks with **PM2** to automate application deployments, reducing the time to deploy from 2 minutes to 10 s.
- Reduced the load of the backend by 40% by implementing **Nginx** for **load balancing** and as a reverse proxy, and configuring **cloudflare** to utilize **SSL** connection.

Center for Academic Innovation — Ann Arbor, MI
Software Engineering Intern — *June 2023 – present*

- Developed a history tracking system that creates and stores separate versions of content with each submission, accessible through unique **URL slugs**, leveraging **Vue.js/Vuex** for the front end and **Django** for the back end.
- Implemented a **Vue** pop-up modal using the **Teleport** feature, enabling users to select image from a pre-existing list or upload their own. In the **Django** backend, integrated an **ImageField** for handling user-uploaded images and an **URLfield** for selecting from provided images.
- Improved user experience by optimizing speed for returning to-do list completion data by reducing the usage of **SQL** querying and use **hashmap**, reducing 1-year range's query's response time from 15s to 0.5s.

PROJECTS

Niwenn Driving School application (Mobile App)

- Created a mobile app using **Flutter** with a **Flask** backend and **PostgreSQL database** that similar to Airbnb's functionality, designed to connect driving instructors and students for driver's license training.
- Integrated **Google Firebase** to enable Google account single sign-on; the backend generates a **JWT-based** authentication cookie for the user, which is then returned in a JSON response.
- Developed a reservation system using efficient querying and JSON storage for daily availability, reducing database size and query complexity, while integrating **database indexing** mechanisms for faster data retrieval and modifications.

Operating Systems Suite Development

- Developed a Thread library, encompassing classes **MUTEX**,**CV**, **Thread**, and CPU using C++.
- Design and implement a **Virtual Memory Manager**, leveraging technologies such as page tables, copy-on-write, and a "FIFO" algorithm for efficient **virtual address management**.
- Implemented a secure, **multi-threaded** Network File Server for client-server interactions using **socket programming**, **hierarchical file systems**, and **security protocols**.

Advanced Networking Simulation Project

- Designed an **adaptive bitrate** selection mechanism for a simulated CDN HTTP proxy to optimize data flow, and created a simplified DNS server for geographically-based **load balancing**.
- Built a router model handling **ARP**, **ICMP**, **IPv4 routing**, **checksum validation**, and **longest prefix match** for efficient packet forwarding.