

Jiahao(Jay) Liang

+1 626-541-6820 | jiahao0716@outlook.com | Irvine, California, United States

EDUCATION

University of California, Irvine

Bachelor of Science in Computer Science

Irvine, California

Sep. 2020 - Dec. 2024

PROJECT EXPERIENCE

Distributed Movie Mall Full Stack Web App

- Developed a full-stack online movie store, enabling secure and user-friendly film browsing and purchasing.
- Built a secure **AWS**-based infrastructure with **SSL**-enabled Tomcat, optimized by **JNDI**-managed connection pools and **MySQL** defenses with **stored procedures** and **PreparedStatement**.
- Crafted a seamless user interface using **React.js**, integrating reusable components and custom hooks like **useAuth()** for authentication, **useAnimation()** for engaging user interactions, and an autocomplete search feature, consistently delivering search results in under **1s** through optimized debounce and session caching.
- Integrated a **Java servlet** back-end with **Axios** for efficient **RESTful API** communication and **CRUD** operations, combined with session and cookie management for user state consistency.
- Upgraded the system with **load balancing** and **master-slave** server setup, deploying the application across instances with **MySQL** replication for improved performance, achieving up to **600tps**.

Web Crawler & ElasticSearch Engine

- Developed a **Python** web crawler with ethical practices using the **Factory pattern**, ensuring a **500ms** delay for same-domain requests, and built an **ElasticSearch**-based search engine.
- Efficiently stored large-scale web-scraped data in **JSON** files and utilized a **Priority Queue** in the **Frontier class** for URL management, Ensuring prioritized crawling, avoiding crawler traps and infinite loops.
- Integrated **ElasticSearch** into the **Indexer class** for advanced indexing, using **MinHash** for duplicate detection and **NLTK's PorterStemmer** for text normalization, enhancing efficiency in handling large datasets.
- Built a custom search engine delivering queries within **200ms** across hundreds of thousands of documents, leveraging **TF-IDF ranking**, boolean algorithms, and **NLTK's tokenization** and **stemming** for precision.

ZotVote Server

- Developed a **C**-based voting server at UC Irvine, enabling real-time poll participation and response viewing.
- Achieved a 99.5% data integrity rate by integrating the proprietary **PetrV protocol** (an internal API), using **POSIX System Calls**. Implemented precise message type classification, encompassing operations such as **LOGIN**, **VOTE**, and **LOGOUT**, bolstered by a structured header design.
- Achieved **100tps** on the server by integrating **multi-threading** via the **pthread** library. Concurrent access scenarios boasted a 98% success rate, facilitated by **mutexes**, **read-write locks**, and **Semaphores**.

Distributed Linux Performance Monitoring

- Utilized **C++** to develop a performance monitoring and analysis tool for Linux environments, facilitating real-time metric tracking and system optimization.
- Leveraged **Dockerfile** for smooth **CMake**, **gRPC**, and **Protobuf** integration, achieving a 60% increase in deployment speed and reducing errors to 2% from 10%. Consistently replicated over 5 servers and 10 environments, the modular architecture ensures scalable, minimal server-client coupling.
- Enhanced data retrieval and display efficiency by 30% through optimized **Protocol Buffers** serialization paired with **Qt** integration; models like **cpu_model** and **memory_model** refresh user data tri-secondly.

TECHNICAL SKILLS

Languages: C/C++, Java, Python, JavaScript, HTML, CSS, SQL, Shell, R, RISC-V, Markdown, LaTeX

Tools & Frameworks: AWS, Node.js, React, MongoDB, MySQL, Selenium, GDB, Jmeter, JUnit, Docker, Linux, Git