Jiahao(Jay) Liang

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

EDUCATION

University of California, Irvine   Irvine, California

Bachelor of Science in Computer Science   Sep. 2010 - 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** and **CSS**, integrating reusable components and custom hooks like **useAuth()** for authentication and **useAnimation()** for engaging user interactions.
- 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 **1000 TPS**.

Web Crawler & ElasticSearch Engine

- Developed a **Python** web crawler and built an ElasticSearch-based search engine for the collected data.
- Optimized thread management in the **Worker class** using the Factory pattern, granular locks, BeautifulSoup, and urllib, ensuring ethical web crawling with a **500ms** minimum delay between same-domain requests.
- Efficiently stored large-scale web-scraped data in JSON files and utilized a Priority Queue in the **Frontier class** for URL management, ensuring prioritized and orderly crawling across different domains.
- 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 **300ms** 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 **100 TPS** 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_mode**l 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