YIMIAN LIU

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EDUCATION

Cornell University **Ithaca, NY**
Master of Engineering in Electrical and Computer Engineering; GPA: **3.85/4.00** *Aug. 2022 – Dec. 2023 (Expected)*
Relevant coursework: Distributed Computing Principles, Fundamentals of Machine Learning, Embedded Operating System, Computer Networks, UNIX Tools and Scripting

University of Liverpool **Liverpool, UK**
Bachelor of Engineering in Electrical and Electronics (Honor Degree); GPA: **3.83/4.00** *Sep. 2017 – July 2021*
Relevant coursework: C/C++ Programming, Software Engineering, Image Processing, Neural Networks

SKILLS

Languages: Python, C/C++, TypeScript/JavaScript, Java, HTML/CSS, PHP, Lua, Bash, SQL, Assembly
Frameworks: Kubernetes, Kafka, Nginx, Express, Flask, React, MySQL, Redis, MongoDB, Elasticsearch, Keras
Tools/Skills: Linux, Git, Docker, Node.js, TCP/UDP, AWS, ChatGPT, OOD, RESTful, GraphQL, CI/CD

PROJECTS

Full-Stack Development and Management of High-Traffic Websites and Web Services **Ithaca, NY**
Individual Project *April 2018 – Present*
•Conceptualized, designed, and deployed various self-developed, purpose-specific websites and web services.
•Utilized cutting-edge technologies like Gatsby, **ReactJS**, **Sass**, Bootstrap, WebSocket, and **JQuery** for building interactive and responsive front-ends for websites, using GA4 for data-driven performance tracking and user interaction analysis.
•Efficiently handled back-end services using a mix of Node.js, **Express**, Python **Flask**, and **PHP**, showing flexibility and adaptability across different programming environments and requirements.
•Integrated **MySQL**, **MongoDB**, and **Redis** for effective data management and high-speed data caching.
•Created a highly popular public Random Image API using PHP, MySQL, and Redis, which has **over 90,000 visits** per day, demonstrating the ability to develop and manage high-performance web services.

Deployment and Orchestration of a Robust Kubernetes Infrastructure **Ithaca, NY**
Individual Project *Jan. 2023 – Present*
•Engineered a scalable Kubernetes infrastructure with Kubeadm and Helm, efficiently managing high-traffic web services.
•Leveraged **Docker** for efficient application containerization, enhancing deployment across different environments.
•Orchestrated Docker containers using **Kubernetes** for effective load balancing and auto-scaling.
•Deployed **Nginx** Ingress to manage external service access, enhancing security and load distribution.
•Utilized Prometheus and Grafana to monitor system performance and health, optimizing resource utilization and stability.
•Established a centralized logging infrastructure using Elasticsearch, Logstash, Kibana (**ELK** Stack), and **Kafka**, thereby facilitating real-time log processing, comprehensive system monitoring, and efficient troubleshooting.
•Integrated DroneCI and Github for **CI/CD**, enabling streamlined updates and efficient bug fixes.

Distributed, Linearizable, Sharded Key-Value Database **Ithaca, NY**
Course Project advised by Prof. Lorenzo Alvisi *March 2023 – May 2023*
•Designed and built a robust, sharded key-value store in **Java**, optimized for performance in distributed settings.
•Implemented and modified the **Multi-Paxos** protocol, a crucial algorithm to guarantee the database system's resilience and continued operation, given a majority of servers remain functional.
•Enhanced the system's functionality by streamlining the Multi-Paxos protocol into a simpler, more efficient **Raft**-like protocol, resulting in improved system performance and reduced complexity.
•Employed a strategic approach to optimize the key-value store by incorporating sharding across server groups. Each group was designed to execute the Paxos consensus algorithm, thus ensuring system-wide consistency and reliability.

OTHER EXPERIENCE

•**Machine Learning:** Secured **2nd rank** out of 55 in an in-class Kaggle competition at Cornell by architecting a highly accurate CNN model using **Keras**, with data preprocessing and ensembling techniques applied to a noisy MNIST dataset.
•**Embedded Systems:** Built an access control system with **OpenCV** for facial recognition, Python **Multi-Processing**, touchscreen GUI, Raspberry Pi, servo, ensuring reliable user management, remote access control, and activity logging.
•**Compiler and Network:** Developed SD-IoT Network Operating System (NOS) for NodeMCU, enabling JavaScript to Lua code compilation and supporting **TCP**, **UDP**, and **HTTP** protocols for seamless IoT control and interaction.
•**IoT Systems:** Developed a reliable and secure smart home system with Arduino, ESP8266, CentOS7 server, mmWave Radar, and various sensors, incorporating **C/C++**, MQTT, OTA, and SMS notifications, operating safely for over 3 years.