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*
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.