Ruo Liu

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Education

University of Illinois at Urbana-Champaign

Bachelor of Science in Computer Science; GPA: 3.83 *Expected May 2024*

- Courses: Distributed Systems, Communication Network, Data structure, Database Systems, Machine Learning, System Programming, Discrete Structure, Deep Learning in CV, Reinforcement Learning, Computer Architecture

Projects

E-commerce Microservice Mock | *Java, Spring Cloud, RabbitMq, Redis* April 2023 – June 2023

- Use Spring Cloud Nacos for microservice discovery and configuration management
- Utilized OpenFeign to simplify and streamline inter-service communication by defining declarative RESTful APIs
- Integrated RabbitMQ as the messaging broker enabling reliable and decoupled service interactions
- Implemented shopping cart service allowing clients to add items, update quantities, and remove items
- Implement login with OAuth and Spring Session using Redis for session storage
- Implement caching with Redis storing frequently accessed data to reduce latency and database load

Distributed Transaction | *Go* April 2023 – May 2023

- Implement distributed nodes each with with ability to handle new transactions from clients to maintain distributed accounts and transactions
- Adapt timestamped concurrency control to maintain ACID properties in asynchronous system and avoid deadlock
- Allow clients to initiate, commit or abort transactions and get notified of the execution/failure of the transaction

Raft | *Go* Feb 2023 – Mar 2023

- Implement Raft algorithm to maintain consensus between distributed nodes when majority is alive
- Allow a single leader to be elected using gRPC until it fails and new leader takes over
- Validate the log replication to each node

YOLO-like object detector on PASCAL VOC | *Python* Feb 2023 – Mar 2023

- Set up ResNet based Neural Network with adapted blocks from DetNet to conduct training on processed and augmented dataset
- Implement YOLO-loss including localization, class, and confidence loss
- evaluate the correctness using VOC evaluation metric and get mAP score of 0.51
- Visualize detected object in video with bounding box and label

Non-blocking Network | *C* Nov 2022 – Dec 2022

- Use level-triggered epoll to create non-blocking network with basic functionalities
- Allow user to upload, download and delete files
- Implement text-based protocol with careful error handling

On-Campus food posts Web App | *React, Spring Boot, MySQL* July 2022 – Aug 2022

- Parse over 20,000 on-campus food posting, locations, and users and insert into MySQL database on GCP
- Developed dynamic webpage to view and modify data using React framework
- User can add, update, rate food posts, processed by spring boot backend
- Wrote flexible queries which accept variable amount of search parameter
- Display dynamic list of high rated posts with SQL procedure

Courseable Application | *Java, Android Studio* Nov 2020 – Dec 2020

- Implemented an Android app that listed every Computer Science course on campus
- Allow user to rate each course and give feedbacks

Technical Skills

Languages: C/C++, Python, Java, Go, React, SQL, MongoDB, Rust, HTML/CSS, Haskell, R
Technologies: Git, Docker, RabbitMQ, Kafka, Redis, Spring Boot, Spring Cloud, Nginx