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

Ticketmaster Microservice Mock | *NodeJS, NextJS, Express, MongoDB, k8s*   July 2023 – Sep 2023

- Build full stack ticket trading web microservice with decoupling ticket, order, auth, client services to ensure high scalability and fault tolerance
- Create robust Auth service using JWT, cookie, Typescript, Express and MongoDB allowing signin, signup, signout
- Implemented event history feature using Nats to guarante event restoration, event order, and system reliability
- Created a user-friendly interface using NextJS and Bootstrap CSS
- Create scalable order microservice integrating Node.js, MongoDB, and Stripe as the payment gateway, enabling authenticated users to create order to transact tickets
- Implement load balancing using ingress-Nginx, allowing high availability and optimize resource utilization

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 to detect and categorize objects in images or video frames
- 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 network 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

- Develop a end-to-end social media food app that allowing user to share and rate on food posts
- 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 and Tailwind CSS
- User can add, update, rate food posts, processed by spring boot backend
- Wrote flexible queries which accept variable amount of search parameter

TECHNICAL SKILLS

Languages: React, Node.js, Express, TypeScript, JavaScript, MongoDB, SQL, Go, Python, Java, C/C++, HTML/CSS
Technologies: Git, Docker, RabbitMQ