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, Database Systems, System Programming, Data structure

PROJECTS

Ticketmaster Clone | *NodeJS, NextJS, Express, MongoDB, k8s*   June 2023 – Sep 2023
- Built full stack ticket trading web microservice decoupling services; used Nats as MQ to ensure high scalability and fault tolerance; handled concurrency with version control, using Docker containers with Kubernetes for scalability
- Implemented load balancing using ingress-Nginx, allowing high availability and optimize resource utilization
- Created robust Auth middleware using JWT, cookie, Typescript, Express allowing user login, ensuring user request privileges and system security
- Implemented event history using Nats to guarantee event restoration, event order, and system reliability
- Developed ticket service using Typescript, Express creating RESTful API
- Created a user-friendly interface using NextJS and Bootstrap CSS
- Created scalable order service using NodeJS, MongoDB, and Stripe API, enabling users to pay through Stripe
- Created expiration service using Redis, BullJS, Typescript restricting payment time

Bank Mock | *Go, Postgres, AWS, k8s, gRPC, Redis*   Mar 2023 – May 2023
- Developed bank backend using go, allowing secure transactions between accounts and registration through email verification; create production deployment
- Implemented API calls leveraging gRPC and gRPC gateway to allow higher performance than Gin framework
- Handled deadlock issues using proper locking in Postgres table, and use Gomock for 74% coverage unit testing
- Implemented access and refresh token using PASETO, creating reusable Auth middleware
- Deployed k8s with AWS EKS and ECR, load balancing with Nginx, allowing for public access and auto scaling
- Allowed users to receive and verify through email using Asynq, leveraging Redis for in memory task, persistent storage and high availability

Distributed Transaction | *Go*   Jan 2023 – March 2023
- Implemented distributed nodes each with ability to handle new transactions from clients to maintain distributed accounts and transactions
- Used timestamped concurrency control to maintain ACID properties in asynchronous system and avoid deadlock
- Allowed clients to initiate, commit or abort transactions and get notified of the execution/failure of the transaction

E-Commerce Web | *Java, Spring, MySQL, RabbitMq, Redis*   Sep 2022 – Dec 2022
- Developed a Java E-commerce microservice mock, using RabbitMQ for high availability and async task handling, creating RESTful APIs, managed using Kubernetes
- Used 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 Message broker enabling reliable and decoupled service interactions
- Implemented shopping cart service allowing clients to add items, update quantities, and remove items
- Implemented login with OAuth and Spring Session using Redis for session storage
- Implemented caching with Redis storing frequently accessed data to reduce latency and database load
- Used Nginx for load balancing for better resource utilization by balancing traffic and enhanced resilience by decreasing system downtime

On-Campus food forum | *React, Spring Boot, MySQL*   July 2022 – Aug 2022
- Developed a end-to-end social media food app that allowing user to share and rate on food posts
- Parsed 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: TypeScript, JavaScript, MongoDB, SQL, Go, Python, Java, C/C++, HTML/CSS
Frameworks: React, Node.js, Gin, Spring Boot, gRPC
Technologies: Git, Docker, RabbitMQ, Kubernetes, Nginx, Redis