Hehuan "Howard" Zhong

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EXPERIENCE

Research Software Engineer
Center for High Throughput Computing / Morgridge Institute for Research

Oct 2024 – Present

Madison, WI

- Built the secure **distributed** backend for Pelican, a global high-throughput data platform with monthly releases
- Developed **Go**-based **Command-line tools**, **RESTful APIs**, **database** schemas and ops, **concurrency** control
- Implemented a signal proxying **C++** plugin and privilege-dropping mechanisms in **Go**, to resolve permission issues when Pelican works with XRootD in unpriviledged mode, reducing attack surface
- Architected robust **authentication & authorization** for namespace ownership management, utilizing nonce-based challenges, proof of possession protocols, database-integrated public key verification, and multiple keys
- Designed and developed downtime management feature across 4 types of servers (**stateful**/**stateless**), along with a server graceful shutdown procedure, cutting transfer failures by 42%
- Collaborated on other projects including a **Kubernetes** operator, Pelican's **NextJS** Web UI, etc.
- Communicated with stakeholders & users via workshops, online support, write-ups, diagrams, and other mediums

Backend Developer, Student Lead
UW School of Medicine and Public Health

Aug 2023 – May 2024

Madison, WI (Hybrid)

- Led a team to build, integrate and test a lab recruitment platform, which was selected to NSF Regional I-Corps
- Orchestrated a micro-service structure to synthesize the **Golang** backend (with **auth middleware**), **Python** algorithms, file storage respectively with **Azure** Container App, Serverless Function, Blob and PostgreSQL storage
- Parallelled requests through **Go routines** & channels, optimizing query performance by 57%
- Applied **DevOps** integrations with **Microsoft Azure**, **Docker**, **Github Actions** to perform CI/CD

Fullstack Development Intern
Norfolk Southern Corporation (Fortune 500)

Sep 2023 – Dec 2023

Atlanta, GA

- Developed an industry-leading customer facing portal: Implemented new and refactored existing **Spring Boot** RESTful APIs, carried out frontend development with **React** in Agile workflow
- Built an **ETL** pipeline in **Java** to migrate 800+ customer reports to new database and backend service
- Worked with tech lead to finalize the new database schema design, optimize the **SQL** scripts, write technical docs, and debrief stakeholders in the Sprint Review
- Utilized Jenkins, **Kubernetes**, Argo CI/CD pipelines for automated build and deployment

Software Engineer Intern
Liba LLC

June 2023 – Aug 2023

Sunnyvale, CA

- Refactored **Java Spring Boot** codebase of e-commerce order and promotion services according to **MVC** & **Domain-Driven Design** principles, to optimize the performance of high-throughput system
- Revised the optimistic-lock in **MySQL**, avoiding stock inconsistency risks arising from concurrent orders
- Deployed **Redis** for high throughput scenarios like Flash Sales, improving performance from 500 to 50,000 QPS
- Designed peak-load shifting for order service by asynchronously creating orders using **RocketMQ**

Tutor | CS300: Programming II
UW–Madison

Jan 2022 – May 2022

Madison, WI

- Led weekly meeting which covers topics including sorting algorithms, data structures, OOP in **Java**
- Developed question sets and helped students with course projects coded with **Java**

TECHNICAL SKILLS

Languages: Go, Java, C++, Python, JavaScript, Typescript, SQL, Bash
Frameworks: Kubernetes, Prometheus, Spring Boot, Redis, RocketMQ, Gin, ORMs, React, Next.js, Redux
Developer Tools: Docker, Git, Jmeter, Maven, Postman, Azure, AWS, Jenkins, Jira, Figma, MongoDB, ServiceNow

EDUCATION

University of Wisconsin–Madison
Master of Science - Computer Science, GPA: 3.92

May 2024

Civil Aviation University
Bachelor of Engineering (Honors), GPA: 3.51

June 2021