Howard Zhong

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EXPERIENCE

Research Software Engineer
Oct 2024 – Present

Center for High Throughput Computing / Morgridge Institute for Research *Madison, WI*

- Designed and built Pelican, an **Golang** open-source distributed system for PB-scale data distribution
- Developed RESTful APIs, CLI tools, databases to orchestrate 192 servers, serving 200K+ daily object transfers
- Architected robust authentication & authorization for worker servers, enabling admin to update keys safely
- Designed and developed traffic draining strategies across 4 types of servers, cutting transfer failures by 42%
- Eliminated a critical root-level vulnerability in the public-facing worker server by creating a privilege-dropping mechanism in **Golang** and a **C++** plugin ensuring full functionality in unprivileged mode
- Integrated **Prometheus** metrics to build real-time monitoring, tracking with **Grafana** and **Kibana** dashboards
- Troubleshot anomalies in our **Kubernetes** deployment by analyzing logs, metrics, configs, profiler, etc.
- Enhanced Web UI using **React Hooks** and implemented **Next.js** component with **Material UI**
- Reviewed other developers' PR and design doc; Communicated with stakeholders & users via various mediums

Backend Developer, Student Lead
Jul 2023 – May 2024

UW School of Medicine and Public Health *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
Sep 2023 – Dec 2023

Norfolk Southern (Fortune 500) *Atlanta, GA*

- Developed AccessNS customer portal in Agile workflow: Implemented new and refactored existing **Java Spring Boot** APIs according to MVC & Domain-Driven Design principles; carried out frontend development with **React**
- Built an **ETL** pipeline in **Java** to migrate 800+ customers' report from 5 types of database to a **data warehouse** and backend service integrated with **Databricks**
- 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

Tutor | CS300: Programming II
Jan 2022 – May 2022

UW–Madison *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 - Parcours d'Excellence en Ingénierie (Honors): Transportation, GPA: 3.51 *June 2021*