Richard Zhang

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EDUCATION

University of Waterloo Waterloo, ON

BASc, Systems Design Engineering 3.85 GPA *2022 – 2027*

- Relevant Courses: Data Structures, Algorithms (C++), Statistics, Linear Systems & Signals

WORK EXPERIENCE

Symphonic Labs (AR Glasses) | Software Engineer Intern San Francisco, California

Python, FFMpeg, Redis, Linux, Docker *January 2025 - Present*

- Architected scalable video indexing pipeline for FPV footage indexing for natural language retrieval, leveraging async processing and Vision Language Models (VLMs) to **double processing throughput.**
- Engineered always on "flashback" feature for hardware prototype enabling creators to save recent footage with a single tap, **increasing usable content capture by 40% in user tests.**
- Implemented P2P device communication suite with TCP over WiFi direct and Bluetooth Low Energy protocols, **reducing wireless footage synchronization latency by up to 60%.**

Blendable (Insurance systems) | Backend Engineering Intern Waterloo, ON

Python, Django, MySQL, Docker, Kubernetes *May 2024 - Aug 2024*

- Engineered high-performance Python API layer replacing legacy accounting SaaS, reducing financial analytics latency to **sub 2s** and enabling **real-time insights across 2500**+ insurance plans.
- Streamlined invoice reporting system by unifying **80**+ **report variations** into a single extensible framework, reducing maintenance overhead and accelerating new report generation.
- Updated premiums distribution API to support more complex selling agreements, enabling **onboarding 60 new insurance plans valued at $1M**+.

Jitto (Logistics platform)| Software Engineering Intern Toronto, ON

Typescript, Python, React, AWS, MySQL *Aug 2023 - Dec 2023*

- Led end-to-end logistics platform redesign enabling multi-supplier capabilities through advanced data modeling, delivering **35% higher order fulfillment rates** and doubling the product catalog.

PROJECTS

Wikigraph - Measure things with Wikipedia | Go, Rust, Next.js, PostgreSQL, Docker **Demo**

- Built high-performance REST API computing shortest paths between Wikipedia articles with $<$ 2GB memory footprint, demonstrating efficient graph algorithm implementation and resource optimization.
- Engineered Rust data pipeline with Tokio that compressed 92GB of Wikipedia XML dumps to a 1.27GB binary adjacency list through optimized asynchronous processing.

Hadoop Distributed File System clone | Go, gRPC, Docker, Kubernetes **Github**

- Engineered a fault-tolerant distributed file system with Go and gRPC, implementing self-healing replication, node health monitoring, and content-addressable storage.
- Deployed HDFS style system with client REST API, centralized metadata management, and datanode replication chains on Kubernetes.

MCP Client and Registry | Typescript, Bun, MCP (Model Context Protocol), RAG **Github**

- Developed MCP tool orchestration system using vector similarity search to dynamically connect queries with relevant tools. Implemented lazy loading and TTL-based connection management to 2x maximum concurrently available tools.

Skills

Languages: Go, Python, Rust, TypeScript, SQL, Bash, C++

Frameworks: Chi, Tokio, Express.js, Next.js, Django

Tools: Git, Docker, Kubernetes, AWS, PostgreSQL, Redis, Terraform, Linux, Protobuf