Sirui Li

MSE CIS @ UPenn · Software Engineering · AI/Analytics Engineer · Python/SQL · LLM/RAG + Data Pipelines · Backend Systems
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View Portfolio

EDUCATION

University of Pennsylvania, Philadelphia, PA, United States May 2027 (Expected)
- Master of Science in Engineering in Computer and Information Science GPA: 3.90/4.00

University of Wisconsin-Madison, Madison, WI, United States May 2025 (Conferred)
- Bachelor of Science in Computer Science (Honors) & Mathematics GPA: 3.89/4.00
- Dean's List awardee with additional certification in Educational Policy Studies, Honor Society: Member of Phi Beta Kappa Alpha
- Publication: STAR: Skeletal Token Alignment and Rearrangement for Interaction Recognition, IEEE Transactions on Multimedia

Relevant Coursework: *Distributed Systems; Operating Systems; Algorithms; Database Systems; Big Data Analytics; Software Engineering*

PROFESSIONAL EXPERIENCE

Bank of China, Shenzhen Branch · *Backend Developer and AI Intern* June 2024 - Aug 2024
Shenzhen, Guangdong, China
- Modernized the customer recommendation backend by replacing legacy rule-based systems with a **highly scalable, API-driven architecture**; implemented a **Retrieval-Augmented Generation (RAG)** pipeline using **Python, Flask, and FAISS.**
- Optimized retrieval accuracy through **prompt engineering** and advanced document indexing, enabling more precise financial product suggestions for bank clients.
- Architected an internal service platform integrating LLM services with **on-premise relational databases** via **RESTful APIs**; automated inquiry workflows, reducing manual response time across multiple service teams.

PROJECT & RESEARCH EXPERIENCE

PennCloud Distributed Cloud Platform · *Full Stack Developer (C/C++)* Oct 2025 – Dec 2025
Designed and built a distributed "mini Google Cloud" platform offering webmail and file storage with fault-tolerant backend infrastructure.
- **Architected** a multi-tier distributed system with an HTTP/1.1 frontend and a replicated **key-value store (Bigtable-style)** supporting PUT/GET/CPUT/DELETE for scalable data storage and retrieval.
- Built a **fault-tolerant KV storage** layer with **replication**, a **disk-backed cache (LRU eviction)**, and **checkpointing** to maintain strong consistency under node failures, achieving sub-second failover and reliable state synchronization after crashes.
- Developed a load balancer and multi-threaded web servers to handle concurrent logins and large file uploads (UP TO 3 GB) across Webmail and Drive services, **integrating SMTP/POP3 protocols** for end-to-end email delivery and retrieval.
- **Built an admin-only dashboard** for real-time monitoring, fault injection, and live recovery testing under distributed node failures.

Recommendation Letter Management System · *Full Stack Developer (Java)* Feb 2025 – Apr 2025
University of Wisconsin-Madison, Department of Computer Science
- **Built a full-stack web platform** to simplify academic recommendation workflows for students and professors, addressing inefficiencies in email-based requests and tracking.
- Developed the frontend with **React (Vite, TypeScript)** and backend with **Spring Boot (Java)**, integrating **relational data models in MySQL** for persistent storage and API validation via MySQL Workbench.
- Deployed and tested the system in a local Docker environment to ensure scalability and consistency across development stages.
- **Applied Agile methodology** with iterative sprints, stand-ups, and retrospectives to ensure **on-time delivery** and team collaboration.

Educational Data Mining Research · *Data Analyst* Sep 2025 – Present
University of Pennsylvania (Advisor: Prof. Maciej Pankiewicz, Prof. Ryan Baker)
Analyzed a large historical dataset from the RunCode platform to enable reproducible analytics and modeling of student performance.
- Built a reproducible **batch ETL pipeline** for 100K+ RunCode logs (Pandas/NumPy) with schema validation, deduplication, and versioned train/validation splits.
- Engineered behavioral features and trained interpretable baselines to analyze drivers of student performance (engagement, attempt accuracy, session patterns).

Factory Worker Safety Monitoring (General Motors Collaboration) · *System Developer (C#, Python)* Sep 2024 – May 2025
University of Wisconsin-Madison, Department of Computer Science (Advisor: Prof. Yin Li)
- Developed an **AI-driven motion monitoring system with General Motors (GM)** to **improve factory worker safety** by detecting unsafe or repetitive movements that could lead to strain injuries.
- Designed a **hybrid rule-based framework** for real-time posture risk detection with Python, scikit-learn, and OpenCV.
- Built a mobile monitoring client in Android Studio to stream multimodal sensor data and optimized buffering, synchronization, and CPU scheduling to resolve concurrent gyro–depth overload issues, reducing latency by **40%.**

SKILLS & LANGUAGE

Systems: Distributed Systems (replication, consistency, failover, checkpointing), Concurrency (threads, locks/semaphores/condition variables), Networking (TCP/IP sockets, HTTP/1.1, SMTP/POP3), APIs (REST, RPC/gRPC), Fault Tolerance (2PC, logging/recovery), Database design
Programming: C/C++, C#, Python, Java, SQL, Bash, TypeScript/JavaScript
Tools & Frameworks: Linux, Git, Docker, Flask, Spring Boot, CMake, Makefile, CI/CD (GitHub Actions / Azure DevOps / Jenkins)
Data: SQL (joins, window functions), ETL/ELT, data modeling, data validation, MySQL, FAISS, PostgreSQL, Amazon RDS