Chenguang Liu

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Education

University of California, Berkeley **Berkeley, CA**
M.Arch. in Architecture (Computer Science - focused) | GPA: 3.67 *Aug 2023 – Expected Dec 2026*
- **CS Coursework:** Data Structures, Computer Architecture, Database, Operating Systems, Internet Architecture

Beijing University of Technology **Beijing, China**
B.Arch. in Architecture | GPA: 3.63 *Sep 2018 – May 2023*

Experience

Meituan, Inc **Oct 2024 – May 2025**
Software Engineer Intern *Java, Spring Boot, Spring Cloud, Redis, Kafka*
- **Reduced core API latency by 20%** by refactoring employee services using the **Strategy Pattern**; built a **high-concurrency user management service** consuming employee lifecycle events via **Kafka**.
- Refactored upload/download workflows with the **Template Method Pattern** to support business requirements, leveraging **Redis caching** (15% improvement) and **AWS S3** for scalable Excel file processing.
- Designed and implemented a **delayed task scheduler** using **Redis and Kafka** to support repeatable data migrations, featuring **task cancellation** and **idempotent consumers**, reducing manual re-trigger operations.
- Improved system reliability by **resolving database deadlocks** through refined **transaction boundaries**, and by adding **AOP-based structured logging** with **Prometheus/ELK monitoring** for faster issue diagnosis.

UC Berkeley **Aug 2025 – Present**
Research Assistant *Python, FastApi, PostgreSQL, WebSocket*
- Built a **WebSocket pipeline** between the frontend and **Grasshopper**, enabling streaming of geometric data.
- Designed and implemented a normalized **PostgreSQL schema** modeling core entities (users, connections), supporting concurrent multi-user access.
- Integrated **JWT-based authentication (Auth0)** with **role-based access control (RBAC)** to enforce secure authorization across collaborative sessions.
- Implemented a **real-time polygon similarity engine** based on radial distance metrics, producing a normalized similarity score for geometry comparison.

Projects

Operating System Project | *C, Concurrency, File Systems* | **Dec 2025**
- Implemented **user processes and system calls** including **fork/exec/wait/exit** and **file I/O**, passing **process-tree stress tests** and **recursive multi-threaded stress tests**.
- Designed a **priority-aware scheduler and synchronization layer**, implementing **strict priority scheduling**, **chained priority donation**, and core primitives (**locks**, **semaphores**, **condition variables**).
- Redesigned the **file system** using an **FFS-style indexed allocation scheme**, achieving **2.2×–3.8× speedup** over a **FAT-based design** across sequential and random-access micro-benchmarks.
- Built a **concurrent buffer cache** with **Second-Chance Clock eviction**, reducing **disk I/O latency by ˜80%** (**5× throughput**).

Relational Database Engine | *Java, B+Tree, ARIES Recovery* | **Sep 2025**
- Designed and integrated **clustered B+Tree indexing** to accelerate **range queries** on **large datasets**.
- Implemented and compared multiple **join algorithms** (**nested-loop**, **hash join**, **sort-merge join**), selecting **sort-merge join** to optimize **multi-table joins** and reduce **benchmark I/O from 603 to 8**.
- Designed and implemented a **multi-granularity locking protocol** with **intent locks (IS, IX, S)**, defining **lock compatibility and propagation rules** to ensure safe concurrent access across **hierarchical data structures**.
- Built **ARIES-style redo/undo logging** with **checkpointing** to guarantee **transactional durability** and **correct crash recovery**.

Technical Skills

Languages: Java, C, Python, TypeScript, Rust, Go
Developer Tools: Linux, Bash, Git/GitHub, VS Code, IntelliJ, Vim, GDB, Valgrind, Make, Maven, JUnit
Backend Frameworks & Cloud: Spring Boot, Spring Cloud, FastAPI, Docker, AWS (S3), Prometheus, ELK
Data & Messaging: PostgreSQL, MySQL, Redis, MongoDB, Kafka, Elasticsearch