

Letian Ruan

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Education

Shanghai Jiao Tong University	2022/08 – 2027/08
Bachelor of Engineering in Mechanical Engineering	Shanghai, China

Research

System Engineering Research Assistant	2024/10 – Present
Emerging Parallel Computing Center, advised by Shixuan Sun	SJTU-CSE
<ul style="list-style-type: none">Build a high-performance computing system for highly-skewed graphs and deploy it on AWS as a serverless service.Collaborated with Ant Group to work on real-world complex graphs to accelerate practical applications.	

Open-Source

KiwiDB <i>An elastic KV data storage system derived from Pika</i>	2024/11 – Present
<ul style="list-style-type: none">An implementation of redis server, using rocksdb for persistent storage and braft for cluster management.Improved clarity and consistency. Added command classes for client management and enhanced command functionality with new client-related operations.	
jCourse <i>The largest unofficial course review platform of SJTU</i>	2024/07 – Present
<ul style="list-style-type: none">As of November 2024, more than 28,000 users have posted over 33,000 reviews for 4,500+ courses.One of the main developers and maintainers for the web service based on Next.js and Gin and integrated with Vite, Redis, PostgreSQL and LLM to provide more personalized and faster responses.	

Projects

Chfs <i>A simple distributed file system similar to Google File System</i>	2024/09 – 2024/12
delivered by SJTU IPADS	github: Risc-lt/chfs
<ul style="list-style-type: none">Constructed a basic single-machine inode-based filesystem and extended it into a robust distributed filesystem with file splitting, lock manager and crash recovery.Built the MapReduce framework and achieve the Raft consensus algorithm of leader election, heartbeat mechanism, log replication protocol and snapshot mechanism.	
BusTub <i>A complete row-store relational database system</i>	2024/07 – 2024/09
delivered by CMU Database Group	github: Risc-lt/BusTub
<ul style="list-style-type: none">Implemented a buffer pool to improve memory utilization, developed Extensible HashTable for indexing and used Crabbing Protocol to add read-write locks.Completed basic SQL operators and optimizers on the volcano model and built a centralized transaction manager based on the MVCC protocol, supporting snapshot isolation.	
xv6-riscv <i>A basic operating system based on the RISC-V architecture</i>	2024/02 – 2024/06
delivered by MIT PDOS	github: Risc-lt/xv6-riscv
<ul style="list-style-type: none">Added Lazy Allocation and Copy On Write functionality to the virtual memory module of the xv6 operating systemCompleted thread libraries and synchronization barriers to the kernel module and optimized the buffer pool management in the file system module of xv6 using finer-grained hash tables.	

Teaching

UM-SJTU Joint Institute	Shanghai, China
Teaching Assistant for ENGR1510J Accel. Intro to Comp & Prog	2024/09 – 2024/12
<ul style="list-style-type: none">Worked with the teaching team to coordinate 72 students to reinforce course concepts such as Matlab, c/cpp, data structure & algorithm, and object-oriented programming as well as set up labs and projects for them.	

Skills

- Programming languages:** C++, Golang, Python, Elm and Typescript.
- Tech Skills:** HPC(Graph), DB(OLTP), OS(Microkernel), Cloud(FaaS) and Web(React+Gin/Django)