

Chen Chen | Ph.D. Candidate

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Technical Skills

- **Key-Value/Database:** Indexing (LSM-Tree, B+-Tree), Transaction Processing (concurrency control), Data Storage (file systems, Linux I/O stack), Data Consistency.
- **Performance:** System Performance Profiling and Measurement, Synchronization Mechanisms, modern CPU Architecture, x86 Assembly.
- **Computer Fundamentals:** Algorithms and Data Structures, Complexity Analysis, Computer Organization and Architecture, Operating System Design, Networking.
- **Programming:** System Programming (C/Rust), Scripting (Python/Bash), \LaTeX .

Education

University of Illinois at Chicago

Ph.D. in Computer Science, exp. Dec. 2024

Chicago, IL

01/2020 - present

ShanghaiTech University

Master of Engineering in Computer Science

Shanghai, China

09/2018 - 06/2021

ShanghaiTech University

Bachelor of Engineering in Computer Science

Shanghai, China

09/2014 - 07/2018

Work Experience

Ph.D. Research Intern, Cockroach Labs, Inc.

05/2022 - 08/2022

Key-Value Storage Engine Team

- Worked on disaggregated shared storage in large-scale distributed databases
- Prototyped the concept of shared SSTables in LSM-Tree-based storage engines
- Summary PR: 🐙 <https://github.com/cockroachdb/pebble/pull/1899>

Academic Experience

Ph.D. Student, University of Illinois at Chicago

01/2020 - present

Advisor: Dr. Jakob Eriksson (UIC) and Dr. Xingbo Wu (Microsoft Research)

- Decentralized Scheduling for Concurrent Transaction Processing [1]
 - Proposed a highly efficient concurrency control protocol for transaction processing
- Efficient Data Management with Flexible Address Space [2]
 - Designed the FlexTree index structure to support efficient data shifting operations
 - Implemented FlexSpace, a persistent storage engine that provides a flexible address space
 - Built FlexDB, a simple but highly performant key-value store on top of FlexSpace
 - Open source: 🐙 <https://github.com/flexible-address-space/flexspace>
- REMIX: Efficient Range Query for LSM-Trees [3]
 - Participated in the design, implementation and evaluation of REMIX and RemixDB

- Flat Indexing in KV-embedded File Systems [4]
- Parallel User-level File System Performance Optimization [5, 6, 7]

Publications

- [1] **Chen Chen**, Xingbo Wu, Wenshao Zhong, and Jakob Eriksson. Fast Abort-freedom for Deterministic Transactions. In *IEEE 38th International Parallel & Distributed Processing Symposium (IPDPS '24)*, May 2024.
- [2] **Chen Chen**, Wenshao Zhong, and Xingbo Wu. Building an efficient key-value store in a flexible address space. In *Proceedings of the Seventeenth European Conference on Computer Systems, EuroSys '22*, page 51–68, New York, NY, USA, 2022. Association for Computing Machinery.
- [3] Wenshao Zhong, **Chen Chen**, Xingbo Wu, and Song Jiang. REMIX: Efficient Range Query for LSM-trees. In *19th USENIX Conference on File and Storage Technologies (FAST '21)*, pages 51–64, February 2021.
- [4] **Chen Chen**, Tongliang Deng, Jian Zhang, Yanliang Zou, Xiaomin Zhu, and Shu Yin. FILT: Optimizing KV-Embedded File Systems through Flat Indexing. In *2020 IEEE 40th International Conference on Distributed Computing Systems (ICDCS '20) Poster Paper*, pages 1203–1204, November 2020.
- [5] **Chen Chen**, Jianzhong Liu, Yanliang Zou, Tongliang Deng, Xiaomin Zhu, and Shu Yin. A Case Study on the Efficiency of User-Level Parallel File Systems. In *IEEE 21st International Conference on High Performance Computing and Communications (HPCC '19)*, pages 90–97, August 2019.
- [6] Yanliang Zou, **Chen Chen**, Tongliang Deng, Jian Zhang, Si Chen, Xiaomin Zhu, and Shu Yin. SHC: A Method for Stackable Parallel File Systems in Userspace. In *IEEE 21st International Conference on High Performance Computing and Communications (HPCC '19)*, pages 1374–1381, August 2019.
- [7] Yanliang Zou, **Chen Chen**, Tongliang Deng, Jian Zhang, Xiaomin Zhu, Si Chen, and Shu Yin. User-level parallel file system: Case studies and performance optimizations. *Concurrency and Computation: Practice and Experience*, 34(13):e6905, 2022.
- [8] Noaman Ahmad, **Chen Chen**, Ben Baenen, and Jakob Eriksson. A Scalable Memory-Safe Delegation System. *In Submission*, 2024.
- [9] Wenshao Zhong, Xingbo Wu, **Chen Chen**, and Jakob Eriksson. I/O-efficient Indexing for LSM-Trees. *In Submission*, 2024.

Awards

- EuroSys '22 Student Travel Grant
- ASC Student Supercomputer Challenge 2018: Silver Medal (runner-up), ePrize Award
Media Coverage: [HPCwire 1] [HPCwire 2] [ShanghaiTech]
- ISC Student Cluster Competition 2018: Finalist Rank 4, Highest HPCG Score
Media Coverage: [HPCwire 1] [HPCwire 2]