

Research Interests

I am broadly interested in data-intensive systems and work mainly on database engines, transaction processing, storage management, modern hardware and disaggregated systems. A major theme in my research is to build scalable data-intensive systems by fully exploiting modern hardware through carefully designed scheduling strategies.

Education

- **Simon Fraser University**, Metro Vancouver, BC, Canada
Ph.D. in Computer Science 2020/09 – 2025/05
– Committee: Dr. Tianzheng Wang (Supervisor), Dr. Zhengjie Miao
– Thesis: Systematic Latency Optimizations for Modern Database Systems
- **The University of Waterloo**, Canada
M.Math in Computer Science 2018/09 – 2020/08
- **Nanjing University**, China
B.Eng. in Software Engineering 2014/09 – 2018/06

Awards

- ACM SIGMOD Research Highlights Award, 2023
- Graduate Fellowship, Simon Fraser University, 2020, 2021, 2022, 2023, 2024
- Computing Science Travel Award, Simon Fraser University, 2022

Experience

- **Simon Fraser University** Metro Vancouver, BC
Research Assistant, School of Computing Science 2020/09 – Present
Advisor: Tianzheng Wang
Teaching Assistant, School of Computing Science
– CMPT 459/984: Modern Data Systems 2022/05 – 2022/08
– CMPT 454: Database Systems II 2021/09 – 2021/12
- **Tencent Americas** Metro Vancouver, BC
Database Kernel Research Intern, Tencent Cloud 2021/08 – 2021/10
Applied coroutines to memory-optimized online transactional (OLTP) engines.
- **Telus** Greater Toronto Area, ON
Co-op SDE Intern, Technology Strategy Team 2019/09 – 2020/01
Automated the SD-WAN service provisioning using Nokia VSD and VMWare VCO.
- **The University of Waterloo** Waterloo, ON
Research Assistant, Data Systems Group 2019/01 – 2019/08
Advisor: Jimmy Lin
Accelerated natural language processing against large documents using Spark.
- **SAP** Shanghai, China
SDE Intern, Healthcare Team 2017/07 – 2018/02
Developed patient accounting PoC applications on SAP Cloud Platform.

Artifacts

I have worked on the following systems that are being used by multiple research groups worldwide:

- **PreemptDB**, the first database engine that supports lightweight userspace preemptible transactions
<https://github.com/sfu-dis/preemptdb>
Major contributor and maintainer.
- **MosaicDB**, a memory-optimized OLTP database system for larger-than-memory workloads
<https://github.com/sfu-dis/mosaicdb>
Major contributor and maintainer.
- **CoroBase**, a coroutinized in-memory OLTP database system
<https://github.com/sfu-dis/corobase>
Major maintainer.
- **ERMIA**, a scalable OLTP database system for heterogeneous workloads
<https://github.com/sfu-dis/ermia>
Major maintainer.

Publications¹

Google Scholar: <https://scholar.google.ca/citations?user=U52rdm4AAAAJ>

Citations (as of Feb 2025): 93, h-index: 5

- Low-Latency Transaction Scheduling via Userspace Interrupts. (Representative Pub1)
Kaisong Huang, Jiatang Zhou, Zhuoyue Zhao, Dong Xie, Tianzheng Wang.
ACM SIGMOD International Conference on Management of Data (SIGMOD), 14 pages, 2025.
- The Art of Latency Hiding in Modern Database Engines. (Representative Pub2)
Kaisong Huang, Tianzheng Wang, Qingqing Zhou, Qingzhong Meng.
International Conference on Very Large Data Bases (Proceedings of VLDB), 14 pages, 2024.
- DEX: Scalable Range Indexing on Disaggregated Memory.
Baotong Lu, **Kaisong Huang**, Chieh-Jan Mike Liang, Tianzheng Wang, Eric Lo.
International Conference on Very Large Data Bases (Proceedings of VLDB), 14 pages, 2024.
- Indexing on Non-Volatile Memory: Techniques, Lessons Learned and Outlook.
Kaisong Huang, Tianzheng Wang.
Springer Book, 87 pages, 2023.
- Efficiently Making Cross-Engine Transactions Consistent.
Jianqiu Zhang, **Kaisong Huang**, Tianzheng Wang, King Lv.
ACM SIGMOD Record (Invited), Vol. 52, No. 1, 8 pages, 2023.
- The Past, Present and Future of Indexing on Persistent Memory.
Kaisong Huang, Yuliang He, Tianzheng Wang.
International Conference on Very Large Data Bases (Proceedings of VLDB) (Tutorial), 4 pages, 2022.
Invited for a 90-minute tutorial.
- Evaluating Persistent Memory Range Indexes: Part Two.
Yuliang He, Duo Lu, **Kaisong Huang**, Tianzheng Wang.
International Conference on Very Large Data Bases (Proceedings of VLDB), 14 pages, 2022.
- Skeena: Efficient and Consistent Cross-Engine Transactions.
Jianqiu Zhang, **Kaisong Huang**, Tianzheng Wang, King Lv.
2023 ACM SIGMOD Research Highlight Award
ACM SIGMOD International Conference on Management of Data (SIGMOD), 15 pages, 2022.

¹Proceedings of VLDB and SIGMOD are the top two conferences for database systems. CIDR is the premier systems-oriented conference, complementary in its mission to the mainstream database conferences like SIGMOD and VLDB, emphasizing the systems architecture perspective.

- Rethinking the Performance/Cost of Persistent Memory and SSDs.
Kaisong Huang, Darien Imai, Tianzheng Wang, Dong Xie.
Annual Non-Volatile Memories Workshop (NVMW), 2-page extended abstract, 2022.
Invited for a full-length 20-minute oral presentation.
- SSDs Striking Back: The Storage Jungle and Its Implications on Persistent Indexes. (Representative Pub3)
Kaisong Huang, Darien Imai, Tianzheng Wang, Dong Xie.
The Conference on Innovative Data Systems Research (CIDR), 8 pages, 2022.

Talks

- Hiding and Reducing Latency in Modern Database Engines.
 - **Microsoft Research**, Redmond, WA, November 2024.
 - **State University of New York at Buffalo**, Buffalo, NY, November 2024.
 - **Penn State University**, State College, PA, December 2024.
- The Art of Latency Hiding in Modern Database Engines.
 - **VLDB**, Guangzhou, China, August 2024.
 - **Simon Fraser University** (systems group seminar), Burnaby, BC, April 2024.
 - **The Northwest Database Society (NWDS)**, Google, Kirkland, WA, February 2024.
- The Past, Present and Future of Indexing on Persistent Memory.
 - **VLDB**, Sydney, Australia, September 2022 (*90-minute tutorial*).
- Skeena: Efficient and Consistent Cross-Engine Transactions.
 - **Microsoft Research**, Redmond, WA, December 2022.
 - **SIGMOD**, Philadelphia, PA, June 2022.
- Rethinking the Performance/Cost of Persistent Memory and SSDs.
 - **Non-Volatile Memory Workshop**, San Diego, CA, May 2022

Professional Activities

- **Committee member**: The Conference on Information and Knowledge Management (CIKM) 2024; SIGMOD Availability 2022.
- **External reviewer**: CIKM 2023.
- **Journal reviewer**
 - The VLDB Journal (VLDBJ) 2025–2026
 - Journal of Systems Architecture (JSA)
 - ACM Transactions on Architecture and Code Optimization (TACO)
 - IEEE Transactions on Computers (TC)
 - IEEE Transactions on Knowledge and Data Engineering (TKDE)
- **Student volunteer**: VLDB 2023, Vancouver, BC.