HAOZE SONG

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SUMMARY OF ACHIEVEMENTS

- Published 7 papers at top database and systems venues (including 3 first-author papers), such as *VLDB 2025, SIGMOD 2024, SIGMOD 2023, EuroSys 2021, and VLDB Journal*.
- Another 6 papers are currently under submission, including 3 papers undergoing major revision.
- Two system prototypes have been successfully integrated into ***real-world industrial products***:
  - K2, a multi-region transaction protocol, has been adopted by Huawei Cloud as its data foundation, gradually supporting all root services (e.g., Identity and Access Management, IAM).
  - METIS, an HTAP-native query processing engine, has been integrated into Alibaba Cloud's flagship database product, PolarDB, as a component of its HTAP optimizer.

EDUCATION

The University of Hong Kong (HKU) *Sep 2020 - Aug 2025 (Expected)*
Ph.D. in Computer Science *Advisor: Dr. Heming Cui*
Research Interests: I am broadly interested in system-oriented research, with a particular focus on distributed systems (including distributed transactions, consensus, and cloud-native database engines).

University of Science and Technology of China (USTC) *Aug 2016 - Jun 2020*
B.S. in Computer Science and Engineering
Huaxia Yingcai College (Special Elite Class)
GPA: 3.81/4.3 Rank: 7/153 (Top 5%) Outstanding Graduates Honor

Shanghai Jiao Tong University (SJTU) *Jun 2018 - Sept. 2018*
Exchange Student in Computer Science
GPA: 4.3/4.3

EXPERIENCE

DAMO Academy, Alibaba *June 2022 - Sept. 2023*
Database Group on System and Kernel Research *Advisor:Wenchao Zhou and Feifei Li*
Research Internship

· Project: Cloud-native HTAP, which achieves 100× speed up for TPC-H queries and $\leq 5ms$ visibility delays for data replication. The new technologies (i.e., efficient data replication and hybrid query plans) have been integrated into PolarDB (the core database product) in Alibaba Cloud.

Huawei Cloud, Huawei *June 2024 - March 2025*
Department of Architecture Innovation *Advisor: Hao Feng*
Research Internship

· Project: A multi-region NewSQL database, which provides 99.999% availability, the strongest consistency, and extremely high scalability. The core techniques (i.e., distributed transaction protocol) will be integrated into TKV and serve as the foundation backend for Huawei Cloud.

PUBLICATIONS

[**C1**] *Haoze Song, Yongqi Wang, Xusheng Chen, Hao Feng, Yazhi Feng, Xieyun Fang, Heming Cui*, and *Linghe Kong. K2: On Optimizing Distributed Transactions in a Multi-region Data Store with True-Time Clock. International Conference on Very Large Data Bases (**PVLDB**), **2025***

[**C2**] *Haoze Song, Wenchao Zhou, Feifei Li, Xiang Peng, Heming Cui. Rethink Query Optimization in HTAP Databases. ACM International Conference on Management of Data (**SIGMOD**), **2024***

[**J1**] *Haoze Song, Wenchao Zhou, Heming Cui, Xiang Peng, Feifei Li. A Survey on Hybrid Transactional and Analytical Processing. International Journal on Very Large Databases (**VLDBJ**), **2024***

[**C3**] *Jianying Wang, TongLiang Li, Haoze Song, Xinjun Yang, Wenchao Zhou, Feifei Li, et al. PolarDB-IMCI: A Cloud-Native HTAP Database System at Alibaba. ACM International Conference on Management of Data (**SIGMOD**), **2023***

[**C4**] *Xusheng Chen, Haoze Song, Jianyu Jiang, Chaoyi Ruan, Cheng Li, Seng Wang, Gong Zhang, Reynold Cheng, Heming Cui. Achieving Low Tail-latency and High Scalability for Serializable Transactions in Edge Computing. The European Conference on Computer Systems (**EuroSys**), **2021***

[**C5**] *Xusheng Chen, Shixiong Zhao, Ji Qi, Jianyu Jiang, Haoze Song, Cheng Wang, Tsz On Li, Hubert Chan, Fengwei Zhang, Xiapu Luo, Sen Wang, Gong Zhang, Heming Cui. Efficient and DoS-resistant Consensus for Permissioned Blockchains. ACM **SIGMETRICS Performance**, **2021***

[**C6**] *Yu Zhang, Haowei Deng, Quanxi Li, Haoze Song* and *Leihai Nie, Optimizing quantum programs against decoherence: delaying qubits into quantum superposition. International Symposium on Theoretical Aspects of Software Engineering (**TASE**), **2019***

PAPERS IN SUBMISSION (PREPRINTS)

[**S1**] *Haoze Song, Xusheng Chen, Ruijie Gong, Tianxiang Shen, Cheng Li, Hao Feng, Sen Wang, Gong Zhang, Heming Cui. Perseus: Achieving Strong Consistency and High Data Freshness for Scalable Geo-distributed HTAP. **Major Revision in SIGMOD***

[**S2**] *Haoze Song, Ruijie Gong, Xusheng Chen, Tianxiang Shen, Yuhao Qing, Sen Wang, Gong Zhang, Hao Feng*, and *Heming Cui.* RELAY*: High-performance Transactions in Heterogeneous Networks via Consistency Tiering. Submitted to Transactions on Computer Systems (TOCS)*

[**S3**] *Tianxiang Shen, Ji Qi, Haoze Song, Gong Zhang, Xiaopu Luo*, and *Heming Cui. Achieving Efficient and Compressible Indexing on Encrypted Databases. **Major Revision in TKDE***

[**S4**] *Guoli Wei, YongKun Li, Haoze Song, Lulu Yao, Yinglong Xu, Bokang Zhang, Liu Tang*, and *Qiu Cui, DMTree: Resolving the Performance Tradeoffs of Tree Indexing on Disaggregated Memory. **Major Revision in USENIX Conference on File and Storage Technologies (FAST), 2025***

[**S5**] *Zheng Liu, Haoze Song, YongKun Li, Yinglong Xu, Patrick P.C. Lee, Xusheng Chen, Yazhi Feng*, and *Hao Feng. PartialKV: On Optimizing Partial Access for Persistent Key-Value Store in Modern Memory Hierarchy.*

[**S6**] *Zekai Sun, Xiuxian Guan, Haoze Song, Yuhao Qing, Tianxiang Shen, Dong Huang, Fangming Liu, Heming Cui. Hybrid-Parallel: Achieving High Performance and Energy Efficient Distributed Inference on Edge Computing. Submitted to International Conference on Mobile Computing and Networking (MobiCom), 2025*

TECHNOLOGY TRANSFER (PATENTS)

[**P1**] *Haoze Song, Xusheng Chen, Yazhi Feng, Xieyun Fang, A scalable high-performance and high-precision timestamp batching framework. Ref.92083535*

[**P2**] *Haoze Song, Yongqi Wang, Xusheng Chen, Yazhi Feng, An efficient, strongly consistent, and decentralized visibility control method based on high-precision clocks. Ref. 92076896*

[**P3**] *Xusheng Chen, Haoze Song, Jianyu Jiang, Heming Cui, Sen Wang, Peng Wang*, and *Gong Zhang. A system in achieving low tail-latency and high scalability for serializable transactions in edge computing. CN 2021101523346.3*

PROFESSIONAL SERVICE

External/Artifact reviewers in system conference: *OSDI, NSDI, ATC, EuroSys, and DSN*

External reviewers in system journals: *IEEE Transactions on Parallel and Distributed Systems (TPDS)*

TEACHING EXPERIENCE

COMP-3358 Distributed and Parallel Computing, HKU, Teaching Assistant 2023 Spring, 2024 Spring

COMP-7305 Cluster and cloud computing, HKU, Teaching Assistant 2021 Summer, 2022 Spring

SELECTED AWARDS

Outstanding Research Intern, Alibaba Group, Top 5% 2023

Postgraduate Scholarships, The University of Hong Kong 2020∼2025

Outstanding Graduates Honour, University of Science and Technology of China, Top 10% 2020

Elite Class Honor, University of Science and Technology of China, Top 10% 2018, 2019, 2020

Second Class scholarship, University of Science and Technology of China, Top 20% 2019, 2020