BINGNAN CHEN

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About Me

A Ph.D. student in Computer Science and Engineering at the Hong Kong University of Science and Technology (HKUST), where I also completed my MPhil degree. Prior to that, I received my bachelor's degree from the University of Science and Technology of China (USTC).
My research interests focus on database optimization algorithms, query processing and query optimization under the supervision of Prof. Ke Yi.

Education

- **The Hong Kong University of SCience and Technology** *Sept.*
  Doctor of Philosophy (PhD) Hong Kong, China
- **The Hong Kong University of SCience and Technology** *Sept., 2021*
  Master of Philosophy (MPhil) Hong Kong, China
- **University Of Science and Technology of China** *Sept., 2017*
  Computer Science Bachelor Hefei, China

Research

- **Yannakakis$^+$: An optimization algorithm for SPJA queries** *Sept. 2023 - Sept. 2024*
  Tools: Python, Java & Scala
  ◦ Design and implement the Yannakakis$^+$ algorithm, which is an improved version of Yannakakis algorithm with theoretical guarantees and better practical performance.
- **Quorion: A query rewriter with theoretical guarantees and better practical performance** *Sept. 2024 - Mar. 2025*
  Tools: Python, Java & Scala
  ◦ Quorion adopts some of the recently developed query planning methods that provide optimality guarantees, including Yannakakis+, generalized hypertree decompositions (GHD), GYO reduction, and cost-based optimization. Quorion also provides a platform for users to explore different query plans for a given query through a web-based interface and compare their performance with classical query plans.
- **Oblivious Sort: Oblivious sorting algorithm under TEE.** *Aug. 2022 - May. 2023*
  Tools: C++
  ◦ Implement oqsort, bucketOSort, bitonic sort, etc in TEE's secure execution environment.

Experience

- **Alibaba Cloud [🌐]** *Aug. 2023 - Feb. 2024*
  Research Intern Hangzhou, China
  ◦ Design and implement the Yannakakis$^+$ algorithm, which is an improved version of Yannakakis algorithm with theoretical guarantees and better practical performance.
- **SenseTime [🌐]** *Jan. 2021 - Jul. 2021*
  Research Intern Beijing, China
  ◦ Design operators and compilation optimizations in deep learning frameworks.

Publications

C=Conference, J=Journal, S=In Submission, T=Thesis

[C.1] Qichen Wang*, **Bingnan Chen***, Binyang Dai, Ke Yi, Feifei Li, and Liang Lin. Yannakakis$^+$: Practical Acyclic Query Evaluation with Theoretical Guarantees. In Proceedings of the 2025 International Conference on Management of Data (Berlin, Germany) (SIGMOD '25) *(* equal contribution)* [pdf].

[C.2] **Bingnan Chen**, Binyang Dai, Qichen Wang, Ke Yi. Query running too slow? Rewrite it with Quorion!. In Proceedings of the 51st International Conference on Very Large Data Bases, Demo Track (London, United Kingdom), (VLDB '25) [pdf].

[C.3] Tianyao Gu, Yilei Wang, Afonso Tinoco, **Bingnan Chen**, Ke Yi, and Elaine Shi. Flexway O-Sort: Enclave-Friendly and Optimal Oblivious Sorting. In Proceedings of the 34th USENIX Security Symposium (Seattle, Washington, United States) (USENIX Security 2025) [pdf].

Skills

- **Programming Languages:** C++ & C, Python, Java, Scala, SQL, HTML & CSS & JSP, Verilog & System Verilog
- **Web Technologies:** Git, OOP, Django, Vue, Flask
- **Database Systems:** DuckDB, MySQL, PostgreSQL, SparkSQL
- **Data Science & Machine Learning:** PyTorch