

## EDUCATION

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- **Tsinghua University, Beijing, China:** Sept. 2020- Present  
Ph.D. in Computer Science, Institute for Interdisciplinary Information Sciences (IIIS)  
Advisor: Huanchen Zhang
- **Tsinghua University, Beijing, China:** June 2016- May 2020  
B.S. in Biomedical Engineering, School of Medicine  
Advisor: Xiaorong Gao

## WORK EXPERIENCE

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- Research Intern: 2023.7 - 2023.9  
Shanghai Qi Zhi Institute  
**Project:** Cost intelligent cloud database, multi-objective query optimizer design  
**Content:** The goal of the traditional query optimizer is to find the fastest query plan. However, under the cloud environment, execution time is not the only objective. The total dollar cost also matters and it is a tradeoff between these two objectives. The more dollars you spend, the better performance you will receive, thus the execution time will be reduced. We try to design an optimizer that can give the Pareto optimal of the time cost and dollar cost.
- Research Intern: 2024.7 - 2024.9  
Shanghai Qi Zhi Institute  
**Project:** 'Complete' robust query processing on single-node database  
**Content:** Nowadays, every database system has to design a sophisticated join order optimizer(a part of the query optimizer) to guarantee a reasonable query execution time. However, by doing the tuple reduction before the join operations, we can theoretically guarantee the robustness of every join order. We develop a tuple reduction strategy in DuckDB, a commercial database system, and empirically prove that by a suitable tuple reduction strategy, we can reduce the design complexity of the join order optimizer or even eliminate it.

## AWARDS & HONORS

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- 2017: Guangzhou Pharmaceutical Group Scholarship, Tsinghua University
- 2018: Bai Jing Scholarship, Tsinghua University
- 2019: First Prize in the 5th National College Biomedical Engineering Innovation Design Competition

## DIRECTION & INTEREST

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- Database Management System
- Query Optimization

- Adaptive Query Processing
- Robust Query Processing

## PUBLICATIONS

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- Junyi Zhao, Huanchen Zhang, and Yihan Gao. “Efficient Query Re-optimization with Judicious Subquery Selections”. In: Proceedings of the ACM on Management of Data (SIGMOD’23), 1.2: Article 158, 26 pages.

**Abstract:** Query optimizer can make a bad query plan due to the wrong estimation. And a bad query plan can be thousands of times slower than a good plan. Query re-optimization is an adaptive query processing technique that re-invokes the optimizer at certain points in query execution. The goal is to dynamically correct the errors made by the query optimizer. We identify a key weakness in existing re-optimization algorithms: their strategies rely heavily on the optimizer’s initial plan, which can be far away from optimal. Therefore, this paper proposes QuerySplit, a novel re-optimization algorithm that skips the potentially misleading global plan and instead generates subqueries directly from the logical plan as the basic re-optimization units. By postponing (sometimes avoids) the execution of large joins, we maximize their probability of having smaller input sizes.