

QIYANG HE

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🎓 EDUCATION

Purdue University, West Lafayette, IN Jan. 2021 – Present

Ph.D. student in Computer Science GPA: 4.0 / 4.0

Southern University of Science and Technology (SUSTech), Shenzhen Sep. 2016 – Jul. 2020

B.Eng in Computer Science and Engineering GPA: 3.86 / 4.00

👥 PROJECT

Architecting a Query Compiler for Incremental View Maintenance Oct. 2021 – Now

Mentor: **Prof. Tiark Rompf** Purdue University

Leveraging generative programming techniques to add a new C++ codegen backend for SparkSQL to support incremental view maintenance sql queries (achieve up to 10x speedup compared to DBToaster on TPC-H). (Scala, SQL, SparkSQL, C++)

Incremental backup for RocksDB-based services on S3 May 2022 – Aug. 2022

KV Systems Group Pinterest

Implement a prototype for incremental backup from RocksDB-based services to S3 in **Rocksplicator**. (C++, RocksDB, S3)

Efficient Incrementalization of SQL Queries with Nested Aggregates Apr. 2021 – Nov. 2021

Mentor: **Prof. Tiark Rompf** Purdue University

Build novel tree-based index structures to improve the incrementalization efficiency of nested-aggregate queries by up to 1000x over the **DBToaster**. A paper has been accepted by SIGMOD 2022 (Scala, SQL, Pandas)

Implementing a distributed key-value store system based on dslabs Jan. 2021 – May. 2021

Lecturer: **Prof. Yongle Zhang** Purdue CS 505

Implement exactly-once **RPC** protocol, **Primary-Backup** protocol, **Multi-Paxos** (leader election and consensus), and **Sharding** operations and transactions by two-phase commit protocol based on dslabs (**Java**)

Benchmark for auto-scheduler of machine learning compiler Jul. 2020 – Dec. 2020

Mentor: **Fengwei Yu** SenseTime

Do benchmark for auto-schedulers of neural network, including **Ansor**, **autotvm**, **Pytorch** and **FlexTensor** (**PyTorch**, **C**, **Python**, **TVM**)

Improving data ingestion performance in Apache AsterixDB Jul. 2019 – Sep. 2019

Mentor: **Prof. Michael J. Carey** UC Irvine

Decouple the data intaking and data parsing in the data feed of AsterixDB. Make the data parsing parallel and get about 2x over the current AsterixDB (**Java**)

⚙️ PUBLICATION

Reachability types: tracking aliasing and separation in higher-order functional programs

Yuyan Bao, Guannan Wei, Oliver Bračevac, Yuxuan Jiang, Qiyang He, Tiark Rompf

Proceedings of the ACM on Programming Languages, Volume 5 (OOPSLA 2021).

Efficient Incrementalization of Correlated Nested Aggregate Queries using Relative Partial Aggregate Indexes (RPAI)

Supun Abeysinghe, Qiyang He, Tiark Rompf

Proceedings of the 2022 International Conference on Management of Data (SIGMOD 2022).

EXPERIENCE

Research Intern at Pinterest Labs

May 2022 – Aug. 2022

Research Intern at SenseTime

Jan. 2020 – Dec. 2020

HONORS AND AWARDS

1 Gold, 1 Silver and 2 Bronze Medals in ACM-ICPC Asia Regional Contest

2017 – 2018

Bronze Medal, National Olympiad in Informatics, China

Jul. 2015

TECHNICAL SKILLS

Programming Languages: C, C++, Java, Python, Scala, SQL, Bash

Systems and Libraries: Pandas, Git, Latex, SparkSQL