Qiaori Yao

qiaoriyao@outlook.com qiaoriyao.github.io

Education

Huazhong University of Science and Technology Wuhan, China
M.Sc. in Computer System Architecture *09/2019 – 06/2022*
Advised by Prof. Yuchong Hu

Lanzhou University Lanzhou, China
B.Eng. in Computer Science and Technology *09/2015 – 06/2019*
GPA 85/100, Rank 5/70

Publications

[1] **PivotRepair: Fast Pipelined Repair for Erasure-Coded Hot Storage** [link]
Qiaori Yao, Yuchong Hu, Xinyuan Tu, Patrick P. C. Lee, Dan Feng, Xia Zhu, Xiaoyang Zhang, Zhen Yao, Wenjia Wei
42nd IEEE International Conference on Distributed Computing Systems, ICDCS 2022

[2] **StripeMerge: Efficient Wide-Stripe Generation for Large-Scale Erasure-Coded Storage** [link]
Qiaori Yao, Yuchong Hu, Liangfeng Cheng, Patrick P. C. Lee, Dan Feng, Weichun Wang, Wei Chen
41st IEEE International Conference on Distributed Computing Systems, ICDCS 2021

[3] **Exploiting Combined Locality for Wide-Stripe Erasure Coding in Distributed Storage** [link]
Yuchong Hu, Liangfeng Cheng, Qiaori Yao, Patrick P. C. Lee, Weichun Wang, Wei Chen
19th USENIX Conference on File and Storage Technologies, FAST 2021

Research Experience

Data Storage and Application Lab (DSAL), HUST Wuhan, China
Research Assistant *09/2019 – 06/2022*
Advisor: Prof. Yuchong Hu; Collaborator: Prof. Patrick P. C. Lee (*CUHK*)

- **PivotRepair**
  - Conducted measurement analysis and found that congestion is frequent and rapidly changing in hot storage clusters, while some nodes (pivots) still have abundant bandwidth
  - Designed a fast greedy algorithm for constructing optimal pipelined repair tree that exploits pivots to bypass congested links and accelerate the repair in erasure-coded hot storage
- **StripeMerge**
  - Proposed an efficient wide-stripe generation approach for erasure-coded storage, which carefully selects and merges narrow stripes into wide stripes to minimize wide-stripe generation bandwidth
  - Used the bipartite graph model to prove the existence of an optimal scheme that does not incur any data transfer for wide-stripe generation, yet which is computationally expensive
  - Designed two heuristics that can efficiently generate schemes with only limited wide-stripe generation bandwidth overhead
- **ECWide**
  - Engaged in the design of a repair-efficient mechanism that utilizes the combination of both parity locality and topology locality to reduce repair penalty for wide stripes as a major contributor
  - Implemented and evaluated the prototype for cold storage that supports multi-node encoding

Professional Experience

KV Storage Group, Wechat, Tencent Guangzhou, China

Software Engineer *07/2022 – Present*

- Designed and implemented the full-text index for a distributed table-like database system atop LevelDB
- Built a scheduling mechanism to reduce request latency while keeping workload balance for the distributed KV storage system based on dynamic routing
- Contributed to the KV storage system in other respects, including new feature development, bug fixes, performance benchmarks, and technical surveys

Inference Engine Group, Cambricon Beijing, China

Software Engineer Intern *11/2021 – 02/2022*

- Investigated passes in MLIR, including passes within the same dialect and passes between different dialects
- Helped with fixing bugs and testing for the inference engine based on Cambricon's Domain Specific Architecture (DSA) machine learning accelerator

Honors

- Outstanding Contributor in 2023H2, *Tencent* *01/2024*
- Outstanding Graduate (**Top 10%**), *HUST* *06/2022*
- National Scholarship for Graduate Students (**Top 1%**), *Ministry of Education of China* *12/2021*
- Scholarship of Sangfor, *HUST* *04/2021*

Skills

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

Operating Systems: Linux

Tools: Git, GDB, Bazel, Docker, LaTeX