Jing Lan

jlan22@cse.cuhk.edu.hk · (+852) 6401-8176 · Jing Lan

Education

The Chinese University of Hong Kong (CUHK), Hong Kong, China 2022 – Present

MPhil in Computer Science
Supervisor: Prof. James Cheng

Sun Yat-sen University (SYSU), Canton, China 2018 – 2022

BEng in Computer Science
Supervisors: Prof. Nong Xiao & Prof. Dan Huang
GPA: 3.9

Experience

Flavius: Disaggregated Graph OLAP Engine @ Husky Data Lab, CUHK 2022 – Present

core member Advisor: Prof. James Cheng

We build an in-memory graph OLAP engine with a disaggregated architecture. The system optimizes for highly skewed graph workloads. It processes dominant small queries with high throughput while ensuring QoS for the heavy. Major Contributions:

- A set of novel *Subquery* operators executing optional match, pattern filter, repeated join, etc., and a query planner processing graph queries to operator pipelines.
- A *disaggregated* layout with a compute cluster connected to clients, planning and scheduling queries, and a cache cluster caching data, executing pushdown operators (e.g., filter, aggregation) and distributed joins.
- A push-pull hybrid query engine: The system executes heavy queries in batches, preventing small ones from starvation. A scheduler optimizes the batch size for our performance objectives.

Student Cluster Competition (SCC) @ SYSU 2020 – 2022

leader(2021-22)*, member(2020-21)* Advisor: Prof. Dan Huang

- We exploit HPC systems and win contests in world-famous venues (e.g., ACM SC & European ISC)
- Cluster management from configurable cloud (e.g., TACC Chameleon Cloud) to supercomputers
  - Managing complex toolchains and dependencies with Spack and Modules
  - Tuning system software and applications: CUDA-aware MPI, NUMA-aware thread positioning, etc.
- Application optimizations from various aspects
  - **Parallelism** resolves performance bottlenecks with multi-core and GPU processing
  - **Code optimizations** improve critical *kernels* with tiling, vectorization, etc.
  - **New hardware**: given an experimental MVAPICH interface supporting Nvidia's Bluefield-2 DPU, we speed up a CFD application by bringing *async* Send/Recv methods to process communications

Skills

- Programming Languages: C, C++, Python
- Platform experience: clusters, cloud, supercomputers
- Software: Slurm, Spack, Git, CMake, tmux, LaTeX, etc.
- Languages: English (TOEFL 105, S24), Putonghua

Publications

Honors

2nd Prize (top 10%), Undergraduate Scholarship 2019, 2021
Champion IndySCC@SC, 2021
Honorable Mention SCC@ISC, 2021
2nd Prize (3rd out of 65, and a $9000 bonus!) Sugon Priority Research Application, 2021

Teaching

CSCI1540 Fundamental Computing With C++ 2022

Miscellaneous

- The SYSU SCC Team: https://scc.sysu.tech
- Homepage: https://lan-jing.github.io/