

# JING LAN

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## 🎓 EDUCATION

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**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 / 4.0

## 👥 EXPERIENCE

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**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 translating 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 *configurable*, 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 Competitions (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 clouds (e.g., TACC Chameleon Cloud) to supercomputers (e.g., UToronto Niagara)
  - We use package managers such as Spack and Modules to manage our software stack consisting of complex, multi-version dependencies and various build systems
- Tuning system software and parallel applications
  - We leverage *system features*, e.g., placing threads with NUMA awareness and
  - exploit *application patterns*. At SCC@ISC, we complete an MPI profiler to capture MPI communications and visualize the I/O patterns between processes. We then balance machine I/O for the WRF Model by adjusting the process/thread layout
- In-depth optimizations from various aspects
  - *Parallelism* resolves performance bottlenecks by introducing multi-core and GPU processing
  - *Code optimizations* improve temporal and spatial localities of *kernels* with tiling, vectorization, etc.

## ⚙️ SKILLS

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- Programming Languages: C, C++, Python
- Platform experience: clusters, cloud, supercomputers
- Software: Slurm, Spack, Git, CMake, tmux, L<sup>A</sup>T<sub>E</sub>X, etc.
- Languages: English (TOEFL 105, S24), Putonghua

## 🎓 PUBLICATIONS

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TBD.

## ♡ HONORS

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*2<sup>nd</sup> Prize (top 10%), Undergraduate Scholarship*

2019, 2021

*Champion*

IndySCC@SC, 2021

*Honorable Mention*

SCC@ISC, 2021

*2<sup>nd</sup> Prize (3<sup>rd</sup> out of 65, and a \$9000 bonus!)*

Sugon Priority Research Application, 2021

## 🏛️ TEACHING

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CSCI1540 Fundamental Computing With C++

Fall 2022

## 📖 MISCELLANEOUS

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