

Xinyi CHEN

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EDUCATION

University of Pennsylvania (UPenn)

Ph.D. student in Computer Science

Advisor: Prof. Vincent Liu

Sept. 2019 – present

Philadelphia, United States

Shanghai Jiao Tong University (SJTU)

B.S. in Computer Science

Sept. 2015 – Jun. 2019

Shanghai, China

PUBLICATIONS

[1] **Xinyi Chen**, Liangcheng Yu, Qizhen Zhang, Vincent Liu, “Cowbird: Freeing CPUs to Compute by Offloading the Disaggregation of Memory”, to appear in (*SIGCOMM*), 2023.

[2] Qizhen Zhang, **Xinyi Chen**, Sidharth Sankhe, Zhilei Zhang, Ke Zhong, Sebastian Angel, Ang Chen, Vincent Liu, Boon Thau Loo, “Optimizing Data-intensive Systems in Disaggregated Data Centers with TELEPORT”, in *the ACM Internal Conference on Management of Data (SIGMOD)*, 2022.

[3] Qizhen Zhang, Yifan Cai, **Xinyi Chen**, Sebastian Angel, Ang Chen, Vincent Liu, Boon Thau Loo, “Understanding the Effect of Data Center Resource Disaggregation on Production DBMSs”, in *the 46th International Conference on Very Large Data Bases (VLDB)*, 2020.

[4] Shaobo Wang, Hui Lyu, Jiachi Zhang, Chenyuan Wu, **Xinyi Chen**, Wenchao Zhou, Boon Thau Loo, Susan B. Davidson, Chen Chen, “Provenance for Probabilistic Logic Programs”, in *the 23rd International Conference on Extending Database Technology (EDBT)*, 2020 (*Best Paper Award*).

[5] Yin Lin, **Xinyi Chen**, Xiaofeng Gao, Bin Yao, Guihai Chen, “R2 -Tree: An Efficient Indexing Scheme for Server-Centric Data Center Networks”, accepted by *International Conference on Database and Expert Systems Applications (DEXA)*, 2018

RESEARCH EXPERIENCE

Cowbird: Freeing CPUs to Compute by Offloading the Disaggregation of Memory

UPenn – Advisors: Prof. Vincent Liu

- Propose a new architecture that converts remote memory accesses into local memory access without CPU architecture support by offloading the data transfers.
- Show that Cowbird is general to several hardware settings by implementing it on both Tofino programmable switches and remote servers.
- We adapt a production open-source KV store to use Cowbird. We show that with Cowbird, it can achieve the same throughput as in-memory execution when the work set is larger than local memory.

DBMSs in Data Center Resource Disaggregation

UPenn – Advisors: Prof. Vincent Liu and Prof. Boon Thau Loo

- Run two popular open-source DBMSs (MonetDB and PostgreSQL) and test their performance with the TPC-H benchmark in a recently released operating system for resource disaggregation.
- Evaluate the two DBMS with various configurations and compare their performance with that of single-machine Linux with the same hardware resources.
- The results show that there is significant performance degradation in disaggregation data centers when running DBMS.
- We propose a new architecture that provides operator pushdown on the remote memory nodes. Applications like DBMS or Mapreduce can call the APIs to push down those memory intensive and compute less intensive operators to save the remote memory access and improve the performance.

INDUSTRY EXPERIENCE

DMX group in Microsoft Research

May. 2023 – August. 2023

Research intern in Microsoft

Google Cloud Platform

May. 2022 – August. 2022

SDE intern in Google

SKILLS

C/C++, Python, Java, Latex