2022 HKUST CSE AWARD PAPERS SEMINAR

NOVEMBER 12 SATURDAY

09:30am - 11:30am | Zoom

SIGCOMM Best Paper
Software-Defined Network Assimilation: Bridging the Last Mile Towards Centralized Network Configuration Management with NAssim

Dr. Huangxun Chen
CSE PhD Graduate
Researcher, Huawei Hong Kong Research Center

Co-authors:
Wei Wang (HKUST GZ), Yukai Miao, Haifeng Sun, Hong Xu, Libin Liu, Gong Zhang

SIGMOD Best Paper
R2T: Instance-optimal Truncation for Differentially Private Query Evaluation with Foreign Keys

Dr. Li Chen
CSE PhD Graduate
Assistant Researcher, Zhongguancun Laboratory

Co-authors:
Juanru Fang (HKUST), Ke Yi (HKUST), Yuchao Tao, Ashwin Machanavajjhala

VLDB Best Paper
SANCUS: Staleness-Aware Communication-Avoiding Full-Graph Decentralized Training in Large-Scale Graph Neural Networks

Mr. Wei Dong
CSE PhD Candidate

Co-authors:
Zhao Chen (HKUST), Lei Chen (HKUST), Yingxia Shao, Yanyan Shen, Jiannong Cao

Dr. Jingshu Peng
CSE PhD Graduate

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Passcode: 532599

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Graph neural networks (GNNs) have emerged due to their success at modeling graph data. Yet, it is challenging for GNNs to efficiently scale to large graphs. Thus, distributed GNNs come into play. To avoid communication caused by expensive data movement between workers, we propose SANCUS, a staleness-aware communication-avoiding decentralized GNN system. By introducing a set of novel bounded embedding staleness metrics and adaptively skipping broadcasts, SANCUS abstracts decentralized GNN processing as sequential matrix multiplication and uses historical embeddings via cache. Theoretically, we show bounded approximation errors of embeddings and gradients with convergence guarantee. Empirically, we evaluate SANCUS with common GNN models via different system setups on large-scale benchmark datasets. Compared to SOTA works, SANCUS can avoid up to 74% communication with at least 1.86X faster throughput on average without accuracy loss.

Speaker Bio
Jingshu Peng holds a PhD in Computer Science and Engineering from HKUST, supervised by Prof. Lei Chen and Prof. Lionel Ni. Her research focus is to scale graph learning for efficiency and effectiveness. But anything towards this goal – including new GNN models, algorithms, systems, and algorithm-system co-designs, can be of her interest. Her work has just received the Best Regular Research Paper Award at VLDB 2022.