Wentao Ning

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Research Interests: Recommender System, Graph Neural Networks

Education

The University of Hong Kong (HKU) — Hong Kong SAR
Ph.D. in Computer Science (HKU-SUSTech Joint PhD Program) — 2020–2024 (Expected)

Southern University of Science and Technology (SUSTech) — Shenzhen, China
B.Eng. in Computer Science and Technology, GPA: 3.73/4.00 — 2016–2020

Internship

TikTok, ByteDance — Shanghai, China
Recommendation Algorithm Intern — Nov. 2022 - Mar., 2023

- Leverage different recommendation strategies to increase publish rate of TikTok creators.
  - *Imitation Effect:* Train a model using daily user-publish-video data to learn which kinds of videos that a user can create. Promote author publications by recommending them more they-can-create videos learned by the model.
  - *Traffic Incentives:* Using uplift models to find the users that are insensitive to unpopular (low video views) videos. Recommend more authors' unpopular videos to these users to promote author publications and prevent loss of users.
  - *Comment Incentives:* Investigate the correlation between the number of comments authors received and the number of their video publications. Increase the recommendation of low-comment videos to encourage authors publishing.

TCL Corporate Research(HK) — Hong Kong SAR
Research Intern — Jun. - Aug., 2021

- Propose an automatic effective meta-path searching framework for existing meta-path-based recommenders.
- Propose a GNN-based method for recommendation by using meta-paths.

Huawei Technologies — Dongguan, China
Site Reliability Engineer Intern — Jul. - Aug., 2019

- Mainly engage in monitoring system development. Implemente a load anomaly alert and email notification system.
- Complete 17 instructing documents, 3 demo (database migration tool, monitoring interface customization, key data query and alarm service) and 5 improvement suggestions.

Research Projects

- **Leverage Local and Global Popularity for recommendation** (First author. Submitted to SIGIR'23)
  - Analyze the limitations of existing popularity-aware methods that consider item popularity from a global perspective and propose local popularity to tackle these limitations.
  - Propose the LGP framework based on casual graphs to jointly utilize local and global popularity for recommendation, which is general and can adapt to different use cases.
- **Multi-domain Recommendation with Domain Disentangling and Alignment** (First author. Submitted to KDD'23)
  - Propose an embedding disentangling architecture for multi-domain recommendation, which explicitly disentangles inter-domain and intra-domain knowledge at the embedding level.
  - Formulate a random walk-based domain alignment strategy to identify similar users/items from different domains, which helps to share knowledge and avoid over-fitting.
- **Automatic Meta-Path Discovery for Effective Graph-Based Recommendation** (First author. Accepted by CIKM'22)
  - Propose a general reinforcement learning-based meta-path selection framework *RMS*, which is the first framework that can be plugged into any meta-path-based recommendation models.

  - Develop a new meta-path-based recommendation method *RMS-HRec* and design training strategies to fully explore the potential of meta-paths for recommendation tasks.

- **Towards Efficient MaxBRNN Computation for Streaming Updates** (First author. Accepted by ICDE'21)
  - Propose a novel problem called *streaming MaxBRNN* in spatial database area, which finds the optimal region to deploy a new service point when both the service points and client points are under continuous updates.
  - Devise an efficient slot partitioning-based algorithm (*SlotP*), which divides the space into equal-sized slots and processes each slot independently. Our experiments show that *SlotP* is 2-3 orders of magnitude faster than SoTA baselines.

- **CheetahVIS: A Visual Analytical System for Large Urban Bus Data.** (First author. Accepted by VLDB'20)
  - Built a visual analytical system *CheetahVIS* for efficient massive urban bus data analysis, which builds upon Spark and provides a visual analytical platform for the stakeholders (e.g., city planner, data analysts in bus company) to conduct effective and efficient analytical tasks.

Publications

1. **Wentao Ning**, Reynold Cheng, Jiajun Shen, Nur Al Hasan Haldar, Ben Kao, Xiao Yan, Nan Huo, Tian Li, Wai Kit Lam, Bo Tang. **Automatic Meta-Path Discovery for Effective Graph-Based Recommendation.** In 31st ACM International Conference on Information and Knowledge Management (**CIKM, CCF-B**), 2022.

2. Reynold Cheng, Chenhao Ma, Xiaodong Li, Yixiang Fang, Ye Liu, Victor Y.L. Wong, Esther Lee, Tai Hing Lam, Sai Yin Ho, Man Ping Wang, Weijie Gong, **Wentao Ning**, Ben Kao. **The Social Technology and Research (STAR) Lab in the University of Hong Kong.** ACM SIGMOD Record, 2022.

3. **Wentao Ning**, Xiao Yan, and Bo Tang. **"Towards Efficient MaxBRNN Computation for Streaming Updates."** 2021 IEEE 37th International Conference on Data Engineering (**ICDE, CCF-A**), 2021.

4. **Wentao Ning**, Qiandong Tang, Yi Zhao, Chuan Yang, Xiaofeng Wang, Teng Wang, Haotian Liu, Chaozu Zhang, Zhiyuan Zhou, Qiaomu Shen, and Bo Tang. **"CheetahVIS: a visual analytical system for large urban bus data."** Proc. VLDB Endow (**PVLDB, CCF-A**), 2020.

Scholarships and Awards

- Postgraduate Scholarship 2020–2024
- Outstanding Graduate in Department of Computer Science and Engineering 2020
- Outstanding Graduate in Shuli College 2020
- Outstanding UG Teaching Assistant 2019
- Outstanding Student Scholarship 2017–2019
- Outstanding Freshmen Scholarship 2016

Teaching

- **Teaching Assistant** at The University of Hong Kong Spring 2021
  The Age of Big Data (CCST9047)
- **Teaching Assistant** at Southern University of Science and technology Spring 2020, Fall 2019, Fall 2018
  Operating System (CS302)
  Object Oriented Analysis and Design (CS309)
  Data Structure and Algorithm Analysis (B) (CS203B)

Academic Service

- **Reviewer / External Reviewer**
  - AAAI 2021, 2022; ICDE 2022, 2023; SIGKDD 2021, 2022, 2023
  - CIKM 2021, 2022; VLDB 2023; TKDE 2020, 2021, 2022

Skills

- **Programming:** Python, Java, C++, SQL
- **Tools:** Pytorch, Numpy, Jupyter

Languages

- **Mandarin:** Native, **Cantonese:** Proficient
- **English:** Fluent