CURRICULUM VITAE

PERSONAL DATA

Name: Ziyang Liu

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Major：Software Engineering

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EDUCATION BACKGROUND

Tsinghua University **September 2021 — Now**

- PhD of Science in Software Engineering Beijing, China
- GPA: 4.0/4.0, Ranking: **1/39**
- Supervisor: Chaokun Wang
- Thesis Topic: Graph Neural Networks, Graph Contrastive Learning

Tianjin University **September 2016 — January 2019**

- Master of Science in Computer Science & Technology Tianjin, China
- Supervisor: Di Jin
- Thesis Topic: Graph Neural Networks, Community Detection

Tianjin University **September 2012 — June 2016**

- Bachelor of Science in Computer Science & Technology Tianjin, China
- Graduation projection's tutor: Di Jin

WORKING EXPERIENCES

JD.com **February 2019 — August 2021**

- Algorithm engineer for search & recommendation department Beijing, China
- My responsibilities included developing and optimizing search relevance algorithms and applying large language models (LLMs) to improve the precision of predictions in online environments. I explored two LLMs distillation projects—one focusing on unstructured data and the other on structured data. These models were successfully deployed into the search algorithm pipeline of JD.com (JD.com ranked 47th in the 2024 Fortune Global 500, making it the highest-ranked Chinese internet company), enhancing search accuracy and efficiency. Additionally, I was the first author of papers based on this work, which were presented at ICDM 2020 (oral) and SIGKDD 2021 (workshop).

PUBLICATIONS

[1] **Ziyang Liu**, Chaokun Wang, Hao Feng, Ziyang Chen. Efficient Unsupervised Graph Embedding with Attributed Graph Reduction and Dual-level Loss. TKDE-24: vol. 36, no. 12, pp. 8120-8134.

[2] **Ziyang Liu**, Chaokun Wang, Liqun Yang, Yunkai Lou, Hao Feng, Cheng Wu, Kai Zheng, Yang Song. Incorporating Dynamic Temperature Estimation into Contrastive Learning on Graphs. ICDE-24: 2889-2903 (Full paper, Oral).

[3] **Ziyang Liu**, Chaokun Wang, Cheng Wu. Graph Contrastive Learning with Reinforcement Augmentation. IJCAI-24: 2225-2233 (Full paper, Oral).

[4] **Ziyang Liu**, Chaokun Wang, Yunkai Lou, Hao Feng. Fast Unsupervised Graph Embedding via Graph Zoom Learning. ICDE-23: 2542-2555 (Full paper, Oral).

[5] **Ziyang Liu**, Chaokun Wang, Hao Feng, Lingfei Wu, Liqun Yang. Knowledge Distillation based Contextual Relevance Matching for E-commerce Product Search. EMNLP-22: 63-76 (Full paper, Industrial Track). *Online application on the platform of JD.com*

[6] **Ziyang Liu**, Yunjiang Jiang, Yue Shang, Hongwei Shen, Yun Xiao, Weipeng Yan, Di Jin. BERT2DNN: BERT Distillation with Massive Unlabeled Data for Online E-Commerce Search. ICDM-20: 212-221, Full Paper. *Online application on the platform of JD.com*

[7] **Ziyang Liu**, Chaokun Wang, Shuwen Zheng, Cheng Wu, Kai Zheng, Yang Song, Na Mou. Pone-GNN: Integrating Positive and Negative Feedback in Graph Neural Networks for Recommender Systems. ACM Transactions on Recommender Systems (To appear).

[8] **Ziyang Liu**, Junqing Chen, Yunjiang Jiang, Yue Shang, Zhaomeng Cheng, Yun Xiao, Sulong Xu, Bo Long. Semi-Explicit MMoE via Heterogeneous Multi-Task Learning for Ranking Relevance. SIGKDD-21, Workshop.

[9] Di Jin(*Master's supervisor), **Ziyang Liu**, Weihao Li, Dongxiao He, Weixiong Zhang. Graph Convolutional Networks Meet Markov Random Fields: Semi-Supervised Community Detection in Attribute Networks. AAAI-19: 152-159 (Full Paper, Oral).

[10] Di Jin(*Master's supervisor), **Ziyang Liu**, Dongxiao He, Bogdan Gabrys, Katarzyna Musial. Robust Detection of Communities with Multi-semantics in Large Attributed Networks. KSEM-18: 362-376 (Full Paper, Oral).

[11] Di Jin (*Master's supervisor), **Ziyang Liu**, Ruifang He, Xiao Wang, Dongxiao He. A Robust and Strong Explanation Community Attributed Networks. Chinese Journal of Computers, 2018, 41(07): 1476-1489 (in Chinese).

[12] Hao Feng, Chaokun Wang, **Ziyang Liu**, Yunkai Lou, Zhenyu Liu, Xiaokun Zhu, Yongjun Bao, Weipeng Yan. GraphHI: Boosting Graph Neural Networks for Large-Scale Graphs. ICDE-24 (Full paper, Oral).

[13] Cheng Wu, Chaokun Wang, Jingcao Xu, **Ziyang Liu**, Kai Zheng, Xiaowei Wang, Yang Song, Kun Gai. Graph Contrastive Learning with Generative Adversarial Network. SIGKDD-23: 2721-2730 (Full paper, Oral).

[14] Cheng Wu, Shaoyun Shi, Chaokun Wang, **Ziyang Liu**, Wang Peng, Wenjin Wu, Dongying Kong, Han Li, Kun Gai. Enhancing Recommendation Accuracy and Diversity with Box Embedding: A Universal Framework. WWW-23 (Full paper, Oral).

[15] Cheng Wu, Liang Su, Chaokun Wang, Shaoyun Shi, Ziqian Zhang, **Ziyang Liu**, Wang Peng, Wenjin Wu, Peng Jiang. Learning Multiple User Distributions for Recommendation via Guided Conditional Diffusion. AAAI 2025 (Full paper, Oral).

[16] Hongwei Li, Chaokun Wang, **Ziyang Liu**. Table Embedding Models Based on Contrastive Learning for Improved Cardinality Estimation. APWeb-24 (Full paper, Oral).

[17] Zhenyu Liu, Chaokun Wang, Songyao Wang, Hao Feng, **Ziyang Liu**. Community based dynamic network tight centrality algorithm. NDBC-24. *Sa Shixuan Outstanding Student Paper Award*

[18] Zhizhi Yu, Di Jin, **Ziyang Liu**, Dongxiao He, Xiao Wang, Hanghang Tong, and Jiawei Han. AS-GCN: Adaptive Semantic Architecture of Graph Convolutional Networks for Text-Rich Network. ICDM-21: 837-846 (Full Paper). *Best Student Paper Award Runner-up*

[19] Di Jin, Xiangchen Song, Zhizhi Yu, **Ziyang Liu**, Heling Zhang, Zhaomeng Cheng, Jiawei Han. BiTe-GCN: A New GCN Architecture via Bidirectional Convolution of Topology and Features on Text-Rich Networks. WSDM-21: 157–165 (Full Paper)

[20] Zhizhi Yu, Di Jin, **Ziyang Liu**, Dongxiao He, Xiao Wang, Hanghang Tong, Jiawei Han. Embedding Text-Rich Graph Neural Networks with Sequence and Topical Semantic Structures. KAIS-22: 65(2), 613-640.

[21] Zhizhi Yu, Di Jin, Weijian Guo, Yawen Li, **Ziyang Liu**, Yue Shang, Jiawei Han, Lingfei Wu. TeKo: Text-Rich Graph Neural Networks with External Knowledge. TNNLS-22.

[22] Hongyu Shan, Di Jin, Pengfei Jiao, **Ziyang Liu**, Bingyi Li, Yuxiao Huang. NF-VGA: Incorporating Normalizing Flows into Graph Variational Autoencoder for Embedding Attribute Networks. ICDM-20: 1244-1249.

PAPERS UNDER REVIEW

[1] **Ziyang Liu**, Chaokun Wang, Shuwen Zheng, Cheng Wu, Hao Feng, Li Xu, Yue Zheng, Liang Rong, Peng Li. Molecular Motif Learning. Submit to: Nature Chemistry.

[2] **Ziyang Liu**, Chaokun Wang, Cheng Wu, Hao Feng, Kai Zheng, Yang Song. Training-free and Unbiased Graph Collaborative Filtering for Personalized Recommendations. Submit to: The 41st IEEE International Conference on Data Engineering (ICDE 2025).

[3] **Ziyang Liu**, Chaokun Wang, Heng Zhang. Overview of Graph Contrastive Learning Methods. Submit to: Journal of Software (in Chinese).

[4] Leqi Zheng, **Ziyang Liu**, Chaokun Wang. BPH4Rec: Balancing Self-Presentation and Self-Hiding for Exposure-Aware Recommendation Based on Graph Contrastive Learning. Submit to: The 48th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2025).

[5] Hang Zhang, Chaokun Wang, Hongwei Li, Cheng Wu, Yabin Liu, **Ziyang Liu**. PLForge: Enhancing Language Models for Natural Language to Procedural Extensions of SQL. Submit to: The 41st IEEE International Conference on Data Engineering (ICDE 2025).

[6] Ziqian Zhang, Chaokun Wang, Shuwen Zheng, Cheng Wu, **Ziyang Liu**, Hao Feng. Effective and Scalable Heterogeneous Graph Neural Network Framework with Convolution-oriented Attention. Submit to: The 41st IEEE International Conference on Data Engineering (ICDE 2025).

PATENTS

- Tsinghua University. Object recommendation method, device, electronic equipment, and storage medium [P] China: CN202410046808.7, 2024.01.11 (Chaokun Wang, **Ziyang Liu**, Kai Zheng; During substantive examination)

PROJECT EXPERIENCES

- Tsinghua-Kuaishou Collaboration Project
  - Negative Feedback Mining: I designed algorithms for negative feedback mining in recommendation systems using graph neural networks and graph contrastive learning. Also, I proposed a lightweight graph isomorphism network model to improve model efficiency.
  - Exposure Correction: I addressed unbiased user exposure in Kuaishou's recommendation system. I focused on optimizing graph contrastive learning model efficiency and representation quality, and successfully deployed the models in real-world applications.
- Tsinghua-JD Collaboration Project
  - Search Relevance: I designed a knowledge distillation model to improve query-product relevance in JD's search system. The model outperformed the state-of-the-art methods and was deployed in the online search ranking.
  - Universal User OneID: I participated in the development of a relationship recognition model using social connections and features from geographic, address, and IP data.

AWARDS

- Tsinghua Friends - Huawei Scholarship, November, 2024
- Tsinghua Alumni - Weng Xiaoqi Scholarship, October, 2023
- Tsinghua Friends - Shenyang Hunnan Talent Scholarship, October, 2022
- Best newcomer of JD.com, January, 2020 (**Top 3** in all 13 candidates)
- Outstanding Graduate Students of Tianjin University, January 2019 (**Top 10** in all 129 candidates)
- Kiyoshi Honda's Speech Science Scholarship, January 2019