PERSONAL DATA

Name: Ziyang Liu

Current job: Research Fellow in Boston Children's Hospital, Harvard Medical School

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EDUCATION BACKGROUND & WORKING EXPERIENCES

Boston Children's Hospital, Harvard Medical School **Sep. 2025 — Now**

- PhD of Science in Software Engineering
- Project about: AI4Biology, Gene Regulation Networks, Cell Lineage Tracing

Tsinghua University (Ranked **#11** in globally U.S. News 2025) **Sep. 2021 — Jun. 2025**

- PhD of Science in Software Engineering
- GPA: 4.0/4.0, Ranking: **1/39**
- Thesis Topic: AI4Biology, Graph Neural Networks

JD.com (Ranked **#44** in Fortune Global 500) **Feb. 2019 — Aug. 2021**

- Algorithm engineer for search & recommendation department

- Developed search relevance algorithms using LLMs; led two LLM distillation projects (structured/unstructured data).

- Deployed models into JD.com's search pipeline, improving accuracy & efficiency.

- First-authored papers at ICDM 2020 (oral) and KDD 2021 (workshop) based on this work.

Tianjin University **Sep. 2016 — Jan. 2019**

- M.S. in Computer Technology (2016–2019) | B.S. in Computer Science (2012–2016)
- Supervisor: Prof. Di Jin
- Thesis Topic: Graph Neural Networks, Community Detection

PUBLICATIONS

[1] **Ziyang Liu**, Chaokun Wang. TeRDy: Temporal Relation Dynamics through Frequency Decomposition for Temporal Knowledge Graph Completion. The 63rd Annual Meeting of the Association for Computational Linguistics (ACL 2025, Main Conference).

[2] **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.

[3] **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).

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

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

[6] **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*

[7] **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*

[8] **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, 2025.

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

[10] **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.

[11] **Ziyang Liu**, Chaokun Wang, Hao Feng, Ziyang Chen. Efficient Unsupervised Graph Embedding with Attributed Graph Reduction and Dual-level Loss. Accepted by: ICDE-25 (TKDE Poster Track).

[12] Hang Zhang, Chaokun Wang, Hongwei Li, Cheng Wu, Yabin Liu, **Ziyang Liu**. PLForge: Enhancing Language Models for Natural Language to Procedural Extensions of SQL. SIGMOD 2025.

[13] Leqi Zheng, Chaokun Wang, Zixin Song, Cheng Wu, Shannan Yan, Jiajun Zhang, **Ziyang Liu**. Negative Feedback Really Matters: Signed Dual-Channel Graph Contrastive Learning Framework for Recommendation. NeurIPS 2025.

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

[15] Leqi Zheng, Chaokun Wang, **Ziyang Liu**, Canzhi Chen, Cheng Wu, Hongwei Li. Balancing Self-Presentation and Self-Hiding for Exposure-Aware Recommendation Based on Graph Contrastive Learning. The 48th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR 2025).

[16] 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).

[17] Leqi Zheng, Chaokun Wang, Canzhi Chen, Jiajun Zhang, Cheng Wu, Zixin Song, Shannan Yan, **Ziyang Liu**, Hongwei Li. LAGCL4Rec: When LLMs Activate Interactions Potential in Graph Contrastive Learning for Recommendation. Accepted by: The 2025 Conference on Empirical Methods in Natural Language Processing (EMNLP 2025, Findings).

[18] 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*

[19] 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).

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

[21] 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).

[22] 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).

[23] 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.

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

[25] 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)

[26] 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*

[27] 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.

[28] 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).

[29] 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).

[30] 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).

PAPERS UNDER REVIEW

[1] **Ziyang Liu**, Chaokun Wang, Cheng Wu, Hao Feng, Kai Zheng, Yang Song. Training-free and Unbiased Graph Collaborative Filtering for Personalized Recommendations. Submit to: IEEE Transactions on Knowledge and Data Engineering.

[2] **Ziyang Liu**, Chaokun Wang. Graph Frequency Filtering Learning. Submit to: The 40th AAAI Conference on Artificial Intelligence (AAAI 2026).

[3] Hao Feng, Chaokun Wang, **Ziyang Liu**, Cheng Wu, Ziqian Zhang. Oscillation-Based Label Noise Mitigation for Graph Neural Networks. Submit to: ICLR 2026.

[4] Hao Feng, Chaokun Wang, Cheng Wu, **Ziyang Liu**, Ziqian Zhang. GraphDEm: Dynamic Graph Neural Network with Directional Embedding for Weighted Edge Prediction. Submit to: WSDM 2026.

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)
- Tsinghua University. Method, Apparatus, and Device for Temporal Knowledge Graph Completion Based on Frequency Decomposition [P] China (Chaokun Wang, **Ziyang Liu**; During Application)
- Tsinghua University. A Motif-Level Representation Learning Method and System for Molecular Graphs [P] China (Chaokun Wang, **Ziyang Liu**; During Application)

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

- Outstanding Doctoral Dissertation Award of Tsinghua University, School of Software, June 2025 (**Top 22** in 120 candidates)
- Outstanding Ph.D. Graduate of Tsinghua University, School of Software, June 2025 (**Top 18** in 120 candidates)
- 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