# KAIXIONG ZHOU

## CONTACT INFORMATION

HOMEPAGE: https://kaixiong-zhou.github.io
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## EDUCATION

**Rice University, Houston, USA** *August 2021 - Now*
Ph.D. Student in Computer Science
Department of Computer Science *Advisor: Dr. Xia Hu*

**Texas A&M University, College Station, USA** *August 2018 - August 2021*
Ph.D. Student in Computer Science (Transfer Out)
Department of Computer Science and Engineering *Advisor: Dr. Xia Hu*

**University of Science and Technology of China, Hefei, China** *September 2015 - June 2018*
Master of Science in Information and Communication Engineering
Department of Information Science and Technology *Advisor: Dr. Chen Gong and Zhengyuan Xu*

**Sun Yat-Sen University, Guangzhou, China** *September 2011 - June 2015*
Bachelor in Electronic Information Science and Technology
School of Information Science and Technology *Advisor: Dr. Lin Zhang and Ming Jiang*

Double Major in Mathematics and Applied Mathematics
Department of Mathematics

## RESEARCH INTERESTS

I am broadly interested in data mining and machine learning to advance graph data analysis, including deep graph neural networks, large-scale graph training, graph quantum computing, and their applications for science problems in biochemistry engineering.

## PUBLICATIONS

**\* indicates an equal contribution; 13 papers are published as the first or co-first author; 3 first-author papers are under peer review; and 1 book chapter is published.**

[Frontier' 22] **Kaixiong Zhou**, Xiao Huang, Qingquan Song, Rui Chen, and Xia Hu. "Auto-GNN: Neural Architecture Search of Graph Neural Networks", In *Frontiers in Big Data-Machine Learning and Artificial Intelligence.*

[QTML' 22] **Kaixiong Zhou**, Zhenyu Zhang, Shengyuan Chen, Tianlong Chen, Xiao Huang, Zhangyang Wang, and Xia Hu. "QuanGCN: Noise-Adaptive Training for Robust Quantum Graph Convolutional Networks", In *Quantum Techniques in Machine Learning.*

[NeurIPS' 22] Keyu Duan, Zirui Liu, Peihao Wang, Wenqing Zheng, **Kaixiong Zhou**, Tianlong Chen, Xia Hu, Zhangyang Wang. "A Comprehensive Study on Large-Scale Graph Training: Benchmarking and Rethinking", In *Conference on Neural Information Processing Systems.*

[CIKM' 22] **Kaixiong Zhou\***, Yili Wang\*, Rui Miao, Ninghao Liu, Xin Wang. "AdaGCL: Adaptive Subgraph Contrastive Learning to Generalize Large-scale Graph Training", In *ACM International Conference on Information and Knowledge Management.*

[RecSys' 22] Huiyuan Chen, Xiaoting Li, **Kaixiong Zhou**, Xia Hu, Chin-Chia Michael Yeh, Yan Zheng, Hao Yang. "TinyKG: Memory-Efficient Training Framework for Knowledge Graph Neural Recommender Systems", In *ACM Recommender Systems Conference.*

[KDD' 22] **Kaixiong Zhou**\*, Mingchen Sun\*, Xin He, Ying Wang, and Xin Wang. "GPPT: Graph Pre-training and Prompt Tuning to Generalize Graph Neural Networks", In *ACM SIGKDD Conference on Knowledge Discovery and Data Mining.*

[TPAMI' 22] **Kaixiong Zhou\***, Tianlong Chen\*, Keyu Duan, Wenqing Zheng, Peihao Wang, Xia Hu, Zhangyang Wang. "Bag of Tricks for Training Deeper Graph Neural Networks: A Comprehensive Benchmark Study", In *IEEE Transactions on Pattern Analysis and Machine Intelligence.*

[IJCAI' 22] **Kaixiong Zhou**, Zirui Liu, Rui Chen, Li Li, Soo-Hyun Choi, and Xia Hu. "Table2Graph: Transforming Tabular Data to Unified Weighted Graph", In *Proceedings of International Joint Conference on Artificial Intelligence.*

[AutoML-Conf' 22] Duc N.M Hoang, **Kaixiong Zhou**, Tianlong Chen, Xia Hu, and Zhangyang Wang. "AutoCoG: A Unified Data-Model Co-Search Framework for Graph Neural Networks", In *International Conference on Automated Machine Learning.*

[SIGIR' 22] Huiyuan Chen, **Kaixiong Zhou**, Kwei-Herng Lai, Xia Hu, Fei Wang, and Hao Yang. "Adversarial Graph Perturbations for Recommendations at Scale" (short paper), In *International ACM SIGIR Conference on Research and Development in Information Retrieval.*

[GLB' 22] Keyu Duan, Zirui Liu, Wenqing Zheng, Peihao Wang, **Kaixiong Zhou**, Tianlong Chen, Zhangyang Wang, and Xia Hu. "Benchmarking Large-Scale Graph Training Over Effectiveness And Efficiency", In *Workshop of the Graph Learning Benchmarks of The Web Conference.*

[ICLR' 22] Zirui Liu, **Kaixiong Zhou**, Fan Yang, Li Li, Rui Chen, and Xia Hu. "EXACT: Scalable Graph Neural Networks Training via Extreme Activation Compression", In *International Conference on Learning Representation.*

[ICLR' 22] Zhimeng Jiang, **Kaixiong Zhou**, Zirui Liu, Li Li, Rui Chen, Soo-Hyun Choi, and Xia Hu. "An Information Fusion Approach to Learning with Instance-Dependent Label Noise", In *International Conference on Learning Representation.*

[SDM' 22] Daochen Zha, Kwei-Herng Lai, **Kaixiong Zhou**, and Xia Hu. "Towards Similarity-Aware Time-Series Classification with Graph Neural Networks", In *Proceedings of SIAM International Conference on Data Mining.*

[AAAI' 22] Kai Guo, **Kaixiong Zhou**, Xia Hu, Yu Li, Yi Chang, Xin Wang. "Orthogonal Graph Neural Networks", In *AAAI Conference on Artificial Intelligence.*

[NeurIPS' 21] **Kaixiong Zhou**, Xiao Huang, Daochen Zha, Rui Chen, Li Li, Soo-Hyun Choi, and Xia Hu. "Dirichlet Energy Constrained Learning for Deep Graph Neural Networks", In *Conference on Neural Information Processing Systems.*

[ICCV' 21] Zirui Liu, Haifeng Jin, Ting-Hsiang Wang, **Kaixiong Zhou**, and Xia Hu. "DivAug: Plug-in Automated Data Augmentation with Explicit Diversity Maximization", In *International Conference on Computer Vision.*

[TNNLS' 21] Yuening Li, Zhengzhang Chen, Daochen Zha, **Kaixiong Zhou**, Haifeng Jin, Haifeng Chen, and Xia Hu. "AutoAD: Automated Anomaly Detection via Curiosity-guided Search and Self-imitation Learning", In *IEEE Transactions on Neural Networks and Learning Systems.*

[SIGIR' 21] Huachi Zhou, Qiaoyu Tan, Xiao Huang, **Kaixiong Zhou**, and Xiaoling Wang. "Temporal Augmented Graph Neural Networks for Session-Based Recommendations" (short paper), In *International ACM SIGIR Conference on Research and Development in Information Retrieval.*

[NeurIPS' 20] **Kaixiong Zhou**, Xiao Huang, Yuening Li, Daochen Zha, Rui Chen, and Xia Hu. "Towards Deeper Graph Neural Networks with Differentiable Group Normalization", In *Conference on Neural Information Processing Systems.*

[NeurIPS' 20] Zirui Liu, Qingquan Song, **Kaixiong Zhou**, Ting-Hsiang Wang, Xia Hu. "Detecting Interactions from Neural Networks via Topological Analysis", In *Conference on Neural Information Processing Systems.*

[ICDE' 20] Yuening Li, Zhengzhang Chen, Daochen Zha, **Kaixiong Zhou**, Haifeng Jin, Haifeng Chen, and Xia Hu. "Neural Architecture Search for Outlier Detction" (short paper), In *International Conference on Data Engineering.*

[KDD' 20] Kwei Herng Lai, Daochen Zha, **Kaixiong Zhou**, and Xia Hu. "Aggregation Optimization for Graph Neural Networks", In *ACM SIGKDD Conference on Knowledge Discovery and Data Mining.*

[IJCAI' 20] **Kaixiong Zhou**, Qingquan Song, Xiao Huang, Daochen Zha, Na Zou, Xia Hu. "Multi-Channel Graph Convolutional Networks", In *International Joint Conference on Artificial Intelligence.*

[SDM' 20] Fan Yang, Ninghao Liu, Mengnan Du, **Kaixiong Zhou**, Shuiwang Ji, and Xia Hu. "Deep Neural Networks with Knowledge Instillation", In *SIAM International Conference on Data Mining.*

[IJCAI' 19] Daochen Zha, Kwei-Herng Lai, **Kaixiong Zhou**, and Xia Hu. "Experience Replay Optimization", In *International Joint Conference on Artificial Intelligence.*

[JOCN' 17] **Kaixiong Zhou**, Chen Gong, Nan Wu, and Zhengyuan Xu. "Distributed Channel Allocation and Rate Control for Hybrid FSO/RF Vehicular Ad Hoc Networks", In *IEEE/OSA Journal of Optical Communications and Networking.*

[JLT' 17] **Kaixiong Zhou**, Chen Gong, and Zhengyuan Xu. "Color Planning and Inter-Cell Interference Coordination for Multi-Color Visible Light Communication Networks", In *IEEE/OSA Journal of Lightwave Technology.*

[WCSP' 17] Mian Zeng, **Kaixiong Zhou**, Chen Gong, Shun Lou, and Zhengyuan Xu. "Design and Demonstration of Indoor Visible Light Communication Network with Dynamic User Access and Resource Allocation", *IEEE International Conference on Wireless Communication and Signal Processing.*

[GlobalSIP' 16] **Kaixiong Zhou**, Chen Gong, Qian Gao, and Zhengyuan Xu. "Inter-Cell Interference Coordination for Multi-Color Visible Light Communication Networks", In *IEEE Global Conference on Signal and Information Processing.*

[ICCC' 15] **Kaixiong Zhou**, Lin Zhang, and Ming Jiang. "Enhanced Effective SNR Prediction for LTE Downlink", In *IEEE International Conference in Communication in China.*

## PREPRINTS AND UNDER REVIEW

[Under review] **Kaixiong Zhou**, Ninghao Liu, Fan Yang, Zirui Liu, Rui Chen, Li Li, Soo-Hyun Choi, and Xia Hu. "Adaptive Label Smoothing To Regularize Large-Scale Graph Training".

[Under review] **Kaixiong Zhou**, Xiao Huang, Zirui Liu, Rui Chen, Li Li, Soo-Hyun Choi, and Xia Hu. "Graph isolated training towards efficient graph neural networks".

[Under review] **Kaixiong Zhou***, Cameron Diao*, Xiao Huang, and Xia Hu. "Molcpt: Molecule continuous prompt tuning to generalize molecular representation learning".

## BOOK CHAPTER

**Kaixiong Zhou**, Zirui Liu, Keyu Duan, and Xia Hu. "Graph Neural Networks: AutoML", In *Graph Neural Networks: Foundations, Frontiers, and Applications.*

## WORK EXPERIENCE

**Google Research.** Title: Research Scientist Intern.          *May 2022-August 2022*
**Visa Research**. Title: Research Scientist Intern.          *May 2021-August 2021*
**Samsung Research America**. Title: Research Scientist Intern.          *May 2020-August 2020*

## TEACHING EXPERIENCE

**Teaching Assistant**, Department of Computer Science, Rice University          *2022 Fall*
COMP 680 Statistics for Computing and Data Science

**Guest Lecturer**, School of Information, University of Texas at Austin          *2022 Fall*
The Basic and Advance of Graph Neural Networks

## SELECTED MENTORSHIP

- Cameron Diao, Undergraduate at Rice University. "Molecular representation learning", submission.

- Keyu Duan, Ph.D. at National University of Singapore. "Large-scale Graph training", NeurIPS 2022.

- Zhimeng Jiang, Ph.D. at Texas A&M University, "Noise mitigation", ICLR 2022.

- Zirui Liu, Ph.D. at Rice University. "Graph representation quantization", ICLR 2022.

- Mingchen Sun, Ph.D. at Jilin University. "Graph meta learning", KDD 2022.

- Yili Wang, Ph.D. at Jilin University. "Graph contrastive learning", CIKM 2022.

- Kai Guo, Ph.D. at Jilin University. "Deep graph neural networks", AAAI 2022.

## RESEARCH PROPOSAL WRITING

**Visa Research University Collaboration: Scalable Representation Learning Frameworks To Model Sophisticated Interactions In Large-Scale Graph And Tabular Data**
PI: Xia Hiu          *August 2021*
Led the effort and write the full proposal.

**NSF FAI: Towards Fairness in Deep Neural Networks with Learning Interpretation**
PI: Xia Hu; Co-PI: James Caverlee, Na Zou, Chaitanya Lakkimsetti          *September 2021*
Contributed to the proposal writing about one of the research objective of "Enhancing Fairness via Feature Interpretation".

## RESEARCH EXPERIENCE

**Ph.D., Rice University**          *August 2021-Now*
Large-scale graph training, graph quantum computing, graph machine learning systems.

**Ph.D., Texas A&M University**          *August 2018-August 2021*
Automated graph neural networks, deep graph neural networks, molecular graph analysis.

**Master, University of Science and Technology of China**          *September 2015 - June 2018*
Medium access control and channel coding for wireless visible light communication.

**Bachelor, Sun Yat-Sen University** *2013 - June 2015*
Medium access control for wireless communication.

## ACADEMIC SERVICES

**Program Committee Member:** CIKM' 20, AAAI' 21, ICML' 21, NeurIPS' 21, SIGKDD' 21, AAAI' 22, ICLR' 22, SIGKDD' 22, ICML' 22, IJCAI' 22, NeurIPS 2022.

**Journal Reviewer:** TPAMI.

## HONORS, AWARDS, & FELLOWSHIPS

- Student Travel Grant, CIKM 2022.

- Student Travel Award, KDD 2022.

- Excellent Graduates in Anhui Province, China, 2018.

- Outstanding Graduates Awards, USTC, 2018.

- National Scholarship for Outstanding Graduate Student, 2017.

- First Prize of Excellent Student Scholarship of SYSU, 2012,2013 (top 5%).