

Gang Liu

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RESEARCH INTEREST

- **Machine Learning and Data Mining on Graphs:** Molecular Property Prediction; Molecular Generation
- **Data-Centric Problem & Learning:** Data Augmentation; Data Imbalance; Knowledge Transfer
- **AI for Science:** Material Discovery; Drug Discovery; Computational Social Science

EDUCATION

University of Notre Dame Ph.D. student in Computer Science and Engineering, Advisor: Prof. Meng Jiang	Notre Dame, US 2021–Present
Southwest University B.E. in Software Engineering	Chongqing, China 2017–2021

RESEARCH AND INDUSTRIAL EXPERIENCE

University of Notre Dame , Research Assistant Working on graph machine learning.	Notre Dame, US 2021–Present
Amazon , Applied Scientist Intern Worked on sequential recommendations with Transformers. Outcome submitted to WWW.	Seattle, US May–August, 2023
University of Florida , Research Intern Worked on time series anomaly detection based on deep learning models.	Gainesville, US July–August, 2019

SCHOLARSHIPS AND AWARDS

- ACM SIGKDD Student Travel Award 2022
- Notre Dame Graduate School Conference Presentation Grant 2022
- National Scholarship in China 2020
- Chongqing Undergraduate Student Innovation Project 2019–2020

PUBLICATIONS

Refereed Conference Publications

- [C4] **Liu G**, Inae E, Zhao T, Xu J, Luo T, Jiang M. “Data-Centric Learning from Unlabeled Graphs with Diffusion Model.”, Conference on Neural Information Processing Systems (NeruIPS), 2023. (Acceptance rate 26.1% out of 12343 submissions)
- [C3] **Liu, G.**, Zhao, T., Inae, E., Luo, T., Jiang, M. (2023). “Semi-Supervised Graph Imbalanced Regression”, in Proceedings of *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (KDD), 2023. (Research track; Acceptance rate 22.0% = 313/1416)

- [C2] **Liu, G.**, Zhao, T., Xu, J., Luo, T., Jiang, M. “Graph Rationalization with Environment-based Augmentations”, in Proceedings of *ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (KDD), 2022. (Research track; Acceptance rate 15.0% = 254/1695)
- [C1] Zhao, T., **Liu, G.**, Wang, D., Yu, W., Jiang, M. “Learning from Counterfactual Graph for Link Prediction”, in Proceedings of *International Conference on Machine Learning* (ICML), 2022. (Acceptance rate 21.9% = 1235/5630)

Refereed Journal Publications

- [J5] Zhao, T., Jin, W., Liu, Y., Wang, Y., **Liu, G.**, Günnemann, S., Shah, N., Jiang, M. “Graph Data Augmentation for Graph Machine Learning: A Survey”, *IEEE Data Engineering Bulletin* (DEBULL).
- [J4] **Liu, G.**, Deng, Y., & Cheong, K. H. “Network Immunization Strategy by Eliminating Fringe Nodes: A Percolation Perspective”, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*. (IF = 11.471; DOI: 10.1109/TSMC.2022.3207319)
- [J3] **Liu, G.**, Xiao, F., Lin, C.-T., & Cao, Z. “A Fuzzy Interval Time-Series Energy and Financial Forecasting Model Using Network-Based Multiple Time-Frequency Spaces and the Induced-Ordered Weighted Averaging Aggregation Operation”, *IEEE Transactions on Fuzzy Systems*, 28(11), 2677-2690. (IF = 12.029; DOI: 10.1109/TFUZZ.2020.2972823)
- [J2] **Liu, G.**, & Xiao, F. “A Data-Driven Dynamic Data Fusion Method Based on Visibility Graph and Evidence Theory”, *IEEE Access*, 7, 104443-104452. (IF = 3.367; DOI: 10.1109/ACCESS.2019.2931951)
- [J1] **Liu, G.**, & Xiao, F. “Time Series Data Fusion Based on Evidence Theory and OWA Operator”, *Sensors*, 19(5), 1171. (IF = 3.576; DOI: 10.3390/s19051171)

Refereed Conference Tutorial

- [T1] Tong Zhao, Kaize Ding, Wei Jin, **Gang Liu**, Meng Jiang, and Neil Shah. “Augmentation Methods for Graph Learning.” In the SIAM International Conference on Data Mining (SDM). 2023.

Preprints and Refereed Workshop Publications

- **Liu, G.**, Jiang, M. “Explaining AI-informed Network Intrusion Detection with Counterfactuals”, IEEE INFOCOM 2023 - IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS).
- **Liu, G.**, Zhang, Z., Ning, Z., Jiang, M. “On the Relationship Between Counterfactual Explainer and Recommender”, in the Workshop on Data Science and Artificial Intelligence for Responsible Recommendations (DS4RRS) at ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), 2022.

TEACHING AND PROFESSIONAL SERVICES

- **Teaching Assistant** at University of Notre Dame: Spring 2022, Theory of Computing (CSE 30151); Fall 2021, Database Systems Concepts (CSE 30331)
- **Conference Reviewer:** KDD 2023, ICLR 2024, ICML 2023/2022, NeurIPS 2023/2022, AAAI 2024/2023; SDM 2024
- **Journal Reviewer:** IEEE Transactions on Knowledge and Data Engineering. Information Sciences; Digital Signal Processing; IEEE Transactions on Cybernetics