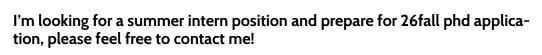
Xu Shen, Master.



Shenxu23@mails.jlu.edu.cn
 shenxu23@mails.jlu.edu.cn

J +86 18903674955





Education

2023 – 2026 M.Sc. Computer Science, Jilin University

Advisor: Prof. Xin Wang.

2019 – 2023 **B.Sc. Computer Science, Ningbo University**

Co-Worker: Prof. Chengbin Peng, Prof Pietro Liò.

Research Interests

2021 – **Trustworthy Deep Learning,** OOD generalization and representation power of GNNs.

2023 – **Generative Models,** Theory and Applications of Generative Models (Diffusion Model, LLMs).

Research Publications (* indicates equal contribution)

- **X. Shen**, Y. Liu, Y. Wang, *et al.*, "Raising the bar in graph ood generalization: Invariant learning beyond explicit environment modeling," in *arXiv* preprint arXiv:2502.10706 (submit to KDD2025), 2025.
- Y. Wang*, Y. Liu*, **X. Shen***, et al., "Unifying unsupervised graph-level anomaly detection and out-of-distribution detection: A benchmark," in *The Thriteen International Conference on Learning Representations (ICLR)*, 2025.
- **X. Shen**, P. Lio, L. Yang, R. Yuan, Y. Zhang, and C. Peng, "Graph rewiring and preprocessing for graph neural networks based on effective resistance," *IEEE Transactions on Knowledge and Data Engineering* (TKDE), 2024.
- **X. Shen**, Y. Wang, K. Zhou, S. Pan, and X. Wang, "Optimizing ood detection in molecular graphs: A novel approach with diffusion models," in *Proceedings of the 30th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD2024)*, 2024, pp. 2640–2650.

Awards

2024 Graduate Merit Scholarship (First Class), Jilin University.

Master Academic Scholarship, Jilin University.

2023 Master Academic Scholarship, Jilin University.

Zhejiang Provincial Government Scholarship, Zhejiang Province.

Zhejiang Provincial Government Scholarship, Zhejiang Province.

Selected Research Experiences

- · Graph rewiring for alleviating over-smoothing and over-squashing
 - **Objective:** Rewiring the graph structure using effective resistance to adjust imbalanced regions aims to mitigate both over-smoothing and over-squashing.

- Methods:

- * Theoretical analysis establishes the relationship between effective resistance, over-smoothing, and over-squashing.
- * A rewiring method is proposed to simultaneously mitigate over-smoothing and over-squashing by balancing effective resistance values in the graph.
- Outcome: A research paper published in TKDE 2024 (Publication #3)

· Leveraging diffusion models for OOD detection in molecular graphs

- **Objective:** Utilizing diffusion models to generate prototype graphs for distinguishing whether input molecular graphs in the testing phase are OOD samples.

- Methods:

- * Proposing a naive validation model, GR-MOOD, which reconstructs inputs and uses reconstruction quality as the OOD judgment score.
- * Generating prototype graphs to avoid reconstructing each input graph with a diffusion model, leading to an efficient OOD detection model: PGR-MOOD.
- Outcome: A research paper published in KDD 2024 (Publication #4)

Service

Conference Reviewer: NeurIPS (2024-2025), ICLR'25, ICML'25, KDD'25.