

Xu Shen, Master.

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I'm looking for a summer intern position and prepare for 26fall phd application, please feel free to contact me!

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)

- 1 **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.
- 2 Y. Wang*, Y. Liu*, **X. Shen***, *et al.*, “Unifying unsupervised graph-level anomaly detection and out-of-distribution detection: A benchmark,” in *The Thirteen International Conference on Learning Representations (ICLR)*, 2025.
- 3 **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.
- 4 **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.
- 2022  **Zhejiang Provincial Government Scholarship**, Zhejiang Province.
- 2020  **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.