# Xuyuan Liu

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## Education

Sep 2023 – *present*
**PhD, Computer Science**, *Dartmouth College*, USA.
- Advisor: **Prof. Yujun Yan**
- Research Focus: LLM Behavior, GNN,Knowledge Graph

Sep 2019 – Jun 2023
**BSc, Computer Science**, *Nankai University*, Tianjin, China.
- Thesis: *Few-shot Knowledge Retrieval Framework in multi-turn Dialogue System*

## Publications

2025 **Xuyuan Liu**, Lei Hsiung, Yaoqing Yang, and Yujun Yan. Spectral Insights into Data-Oblivious Critical Layers in Large Language Models . In *submission to ACL*

2024 **Xuyuan Liu**, Yinghao Cai, Qihui Yang, and Yujun Yan. Exploring Consistency in Graph Representations: from Graph Kernels to Graph Neural Networks . In *Proceedings of the Thirty-Eighth Annual Conference on Neural Information Processing Systems(**NeurIPS**)*

2022 Zichen Liu, **Xuyuan Liu**, Yanlong Wen, Guoqing Zhao, Fen Xia, and Xiaojie Yuan. TreeMAN: Tree-enhanced multimodal attention network for ICD coding. In *Proceedings of the 29th International Conference on Computational Linguistics(**COLING**)*

## Research Experience

June 2024-
***Research Assistant***, *Dartmouth College*.
- Advisor:**Prof. Yujun Yan**.
- Identified Data-Oblivious Critical Layers in pre-fine-tuned models by tracking representation space shifts across layers and then applied spectral analysis to illustrate how principal components account for the representation change points. Finally, we demonstrate the potential application of our findings by applying a targeted backdoor defense. *Link* ( **Submitted to ACL2025**)

Sep 2023 – May 2024
***Research Assistant***, *Dartmouth College*.
- Advisor:**Prof. Yujun Yan**.
- Proposed a novel learning framework that ensures that GNNs consistently capture similarity relationships across different layers, and analysis demonstrates that it enhances the model's generalization ability theoretically. Extensive experiments validate that the plug-in method achieves universal improvements across diverse benchmarks with minimal additional computational overhead.(**NeurIPS 2024**)

Nov 2022- May 2023
***Research Assistant***, *Nankai University*.
- Advisor:**Prof. Zhenglu Yang**.
- Developed the Self-Contextual Representation Learning method to tackle the cold-start problem in dialogue systems enhanced with knowledge graphs. By enriching entity representations with historical context, this method achieved state-of-the-art performance in various zero- and few-shot settings.

## Services and Skills

Programming C, C++, Python, Shell script,SQL

Tools Git, PyTorch, Huggingface, PyG, LaTeX, DeepSpeed, FSDP,vLLM