Xuyuan Liu

Dartmouth College
xuyuan.liu.gr@dartmouth.edu
Homepage *Scholar* *GitHub* *LinkedIn*

Education

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

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

Publications

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**.
- Introduced "Activation Shift" to measure uneven representation space shifts across Transformer layers, linking these shifts to imbalances in training processes during the post-training stage. Validated this phenomenon using LLMs such as Llama and Mistral, along with datasets including GSM8k and Alpaca. Thus, established a connection between representation space shifts and training dynamics. Finally, implemented targeted strategies to address vulnerabilities in specific layers, thereby enhancing model safety and training efficiency. (**Plan to submit 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

Reviewers ICML2025, ICLR 2025, NeurIPS 2024

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

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