Mingxuan (Clark) Ju

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Research Scientist · Snap Inc., 110 110th Ave NE, Bellevue, WA 98004, USA
TEL#: 216-309-4302 | Email: mju@snap.com | Homepage: https://jumxglhf.github.io | GitHub | Google Scholar

Education

University of Notre Dame — Apr. 2020 – Nov. 2024
Ph.D. in Computer Science & Engineering — Notre Dame, IN
Advisor: Dr. Yanfang (Fanny) Ye
Dissertation: Cost-effective Machine Learning Techniques for Graphs

Case Western Reserve University — Jun. 2019 – Mar. 2020
M.S. in Computer and Information Science — Cleveland, OH

Case Western Reserve University — Aug. 2015 – May 2019
B.S. in Computer Science — Cleveland, OH

Research Interests and Applications

Interests: Graph Neural Network (GNN), Recommender System (RecSys), and Self-supervised Learning (SSL).
Applications: *User Modeling*, *User Representation Learning*, and *Retrieval/Ranking in Recommendation*.

Professional Experiences

Research Scientist — Mar. 2024 - Present
Snap Research at Snap Inc., Manager: Dr. Neil Shah. — Bellevue, WA
- Research and develop large-scale sequential models that enhance user representations and internal recommender systems.
- Mentor research interns and produce research outcomes that drive both internal products and academic publications.

Research Intern — Jun. 2023 – Oct. 2023
Snap Research at Snap Inc., Supervisors: Dr. Tong Zhao and Dr. Neil Shah. — Seattle, WA
- Efficient GNNs for RecSys. Significant performance improvement ($\sim$**10**%) with only $\sim$**1**% additional overheads. [S8]
- Performant multi-task GNNs for user representation learning. Promising A/B results and preparing for a **production launch**.

Graduate Research Assistant — Apr. 2020 – Present
University of Notre Dame, Supervisor: Dr. Fanny Ye. — Notre Dame, IN
- Mitigating the degree bias of GNNs by test-time augmentation. [S7]
- Multi-task self-supervised learning for GNNs to improve their generalization and applicability. [S6]
- Research on the adversarial robustness of GNNs through reinforcement learning. [S5]
- Open-domain question answering enhanced by entity relations from knowledge graphs. [S4]
- Adaptive message passing for GNNs to improve their generalization. [S3]
- Emotion analysis on social media platform to study COVID-19 impacts. [S2]

Undergraduate Research Assistant — May 2017 – Mar. 2020
Case Western Reserve University, Supervisor: Dr. Soumya Ray. — Cleveland, OH
- Research on disease classification and won 3rd place in the FEMH cup at IEEE Big Data 2018. [C1]
- Development and deployment of disease pre-diagnosis framework at University Hospital. [J1]

Selected Publications

[S9] **Understanding and Scaling Collaborative Filtering Optimization from the Perspective of Matrix Rank**
*In Proceedings of the ACM Web Conference 2025 (**WWW 2025**)*
Donald Loveland, Xinyi Wu, Danai Koutra, Tong Zhao, Neil Shah, Mingxuan Ju

[S8] **How Does Message Passing Improve Collaborative Filtering?**
*In Proceedings of The Thirty-Eighth Annual Conference on Neural Information Processing Systems (**NeurIPS 2024**)*
Mingxuan Ju, William Shiao, Zhichun Guo, Yanfang Ye, Yozen Liu, Neil Shah, Tong Zhao

[S7] **GraphPatcher: Mitigating Degree Bias for Graph Neural Networks via Test-time Augmentation.**
*In Proceedings of The Thirty-Seventh Annual Conference on Neural Information Processing Systems (**NeurIPS 2023**)*
Mingxuan Ju, Tong Zhao, Wenhao Yu, Neil Shah, Yanfang Ye

[S6] **Multi-task Self-supervised Graph Neural Networks Enable Stronger Task Generalization.**
*In Proceedings of The Eleventh International Conference on Learning Representations (**ICLR 2023**)*
Mingxuan Ju, Tong Zhao, Qianlong Wen, Wenhao Yu, Neil Shah, Yanfang Ye, Chuxu Zhang

[S5] **Let Graph be the Go Board: Gradient-free Node Injection Attack for Graph Neural Networks via Reinforcement Learning.**
*In Proceedings of The 37th AAAI Conference on Artificial Intelligence (**AAAI 2023**)*
Mingxuan Ju, Yujie Fan, Chuxu Zhang, Yanfang Ye

[S4] **Grape: Knowledge Graph Enhanced Passage Reader for Open-domain Question Answering.**
*In Findings of the Association for Computational Linguistics: EMNLP 2022 (**Findings of EMNLP 2022**)*
Mingxuan Ju*, Wenhao Yu*, Tong Zhao, Chuxu Zhang, Yanfang Ye

[S3] **Adaptive Kernel Graph Neural Network.**
*In Proceedings of The 36th AAAI Conference on Artificial Intelligence (**AAAI 2022**)*
Mingxuan Ju, Shifu Hou, Yujie Fan, Jianan Zhao, Liang Zhao, Yanfang Ye

[S2] **Dr. Emotion: Disentangled Representation Learning for Emotion Analysis on Social Media to Improve Community Resilience in the COVID-19 Era and Beyond.**
*In Proceedings of the Web Conference 2021 (**WWW 2021**)-Best Paper Award Shortlist*
Mingxuan Ju, Wei Song, Shiyu Sun, Yanfang Ye, Yujie Fan, Shifu Hou, Kenneth Loparo, Liang Zhao

[S1] **Heterogeneous Temporal Graph Neural Network.**
*In Proceedings of the 2022 SIAM International Conference on Data Mining (**SDM 2022**)*
Yujie Fan, Mingxuan Ju, Chuxu Zhang, Liang Zhao, Yanfang Ye

All Publications (Chronological Order)

Conference Papers *stands for equal contribution

[C19] **GraphHash: Graph Clustering Enables Parameter Efficiency in Recommender Systems**
*In Proceedings of the ACM Web Conference 2025 (**WWW 2025**)*
Xinyi Wu, Donald Loveland, Runjin Chen, Yozen Liu, Xin Chen, Leonardo Neves, Ali Jadbabaie, Mingxuan Ju, Neil Shah, Tong Zhao

[C18] **Understanding and Scaling Collaborative Filtering Optimization from the Perspective of Matrix Rank**
*In Proceedings of the ACM Web Conference 2025 (**WWW 2025**)*
Donald Loveland, Xinyi Wu, Danai Koutra, Tong Zhao, Neil Shah, Mingxuan Ju

[C17] **MOPI-HFRS: A Multi-objective Personalized Health-aware Food Recommendation System with LLM-enhanced Interpretation.**
*In Proceedings of The 31st ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD 2025**)*
Zheyuan Zhang, Zehong Wang, Tianyi Ma, Varun Sameer Taneja, Sofia Nelson, Nhi Ha Lan Le, Keerthiram Murugesan, Mingxuan Ju, Nitesh V Chawla, Chuxu Zhang, Yanfang Ye

[C16] **How Does Message Passing Improve Collaborative Filtering?**
*In Proceedings of The Thirty-Eighth Annual Conference on Neural Information Processing Systems (**NeurIPS 2024**)*
Mingxuan Ju, William Shiao, Zhichun Guo, Yanfang Ye, Yozen Liu, Neil Shah, Tong Zhao

[C15] **From Coarse to Fine: Enable Comprehensive Graph Self-supervised Learning with Multi-granular Semantic Ensemble.**
*In Proceedings of The Forty-First International Conference on Machine Learning (**ICML 2024**)*
Qianlong Wen, Mingxuan Ju, Zhongyu Ouyang, Chuxu Zhang, Yanfang Ye

[C14] **GraphPatcher: Mitigating Degree Bias for Graph Neural Networks via Test-time Augmentation.**
*In Proceedings of The Thirty-Seventh Annual Conference on Neural Information Processing Systems (**NeurIPS 2023**)*
Mingxuan Ju, Tong Zhao, Wenhao Yu, Neil Shah, Yanfang Ye

[C13] **Multi-task Self-supervised Graph Neural Networks Enable Stronger Task Generalization.**
*In Proceedings of The Eleventh International Conference on Learning Representations (**ICLR 2023**)*
Mingxuan Ju, Tong Zhao, Qianlong Wen, Wenhao Yu, Neil Shah, Yanfang Ye, Chuxu Zhang

[C12] **Generate rather than Retrieve: Large Language Models are Strong Context Generators.**
*In Proceedings of The Eleventh International Conference on Learning Representations (**ICLR 2023**)*
Wenhao Yu, Dan Iter, Shuohang Wang, Yichong Xu, Mingxuan Ju, Soumya Sanyal, Chengguang Zhu, Michael Zeng, Meng Jiang

[C11] **Chasing All-Round Graph Representation Robustness: Model, Training, and Optimization.**
*In Proceedings of The Eleventh International Conference on Learning Representations (**ICLR 2023**)*
Chunhui Zhang, Yijun Tian, Mingxuan Ju, Zheyuan Liu, Yanfang Ye, Nitesh Chawla, Chuxu Zhang

[C10] **Let Graph be the Go Board: Gradient-free Node Injection Attack for Graph Neural Networks via Reinforcement Learning.**
*In Proceedings of The 37th AAAI Conference on Artificial Intelligence (**AAAI 2023**)*
Mingxuan Ju, Yujie Fan, Chuxu Zhang, Yanfang Ye

[C9] **Self-Supervised Graph Structure Refinement for Graph Neural Networks.**
*In Proceedings of The 16th ACM International Conference on Web Search And Data Mining (**WSDM 2023**)*
Jianan Zhao, Qianlong Wen, Mingxuan Ju, Yanfang Ye

[C8] **Leveraing Comment Retrieval for Code Summarization.**
*In Proceedings of The 45th European Conference on Information Retrieval (**ECIR 2023**)*
Shifu Hou, Lingwei Chen, Mingxuan Ju, Yanfang Ye

[C7] **Grape: Knowledge Graph Enhanced Passage Reader for Open-domain Question Answering.**
*In Findings of the Association for Computational Linguistics: EMNLP 2022 (**Findings of EMNLP 2022**)*
Mingxuan Ju*, Wenhao Yu*, Tong Zhao, Chuxu Zhang, Yanfang Ye

[C6] **Heterogeneous Temporal Graph Neural Network.**
*In Proceedings of the 2022 SIAM International Conference on Data Mining (**SDM 2022**)*
Yujie Fan, Mingxuan Ju, Chuxu Zhang, Liang Zhao, Yanfang Ye

[C5] **Adaptive Kernel Graph Neural Network.**
*In Proceedings of The 36th AAAI Conference on Artificial Intelligence (**AAAI 2022**)*
Mingxuan Ju, Shifu Hou, Yujie Fan, Jianan Zhao, Liang Zhao, Yanfang Ye

[C4] **Dr. Emotion: Disentangled Representation Learning for Emotion Analysis on Social Media to Improve Community Resilience in the COVID-19 Era and Beyond.**
*In Proceedings of the Web Conference 2021 (**WWW 2021**)-**Best Paper Award Shortlist***
Mingxuan Ju, Wei Song, Shiyu Sun, Yanfang Ye, Yujie Fan, Shifu Hou, Kenneth Loparo, Liang Zhao

[C3] **Heterogeneous Temporal Graph Transformer: An Intelligent System for Evolving Android Malware Detection.**
*In Proceedings of The 27th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD 2021**)*
Yujie Fan, Mingxuan Ju, Shifu Hou, Yanfang Ye, Wenqiang Wan, Kui Wang, Yinming Mei, Qi Xiong

[C3] **Disentangled Representation Learning in Heterogeneous Information Network for Large-scale Android Malware Detection in the COVID-19 Era and Beyond.**
*In Proceedings of The 35th AAAI Conference on Artificial Intelligence (**AAAI 2021**)*
Shifu Hou, Yujie Fan, Mingxuan Ju, Yanfang Ye, Wenqiang Wan, Kui Wang, Yinming Mei, Qi Xiong, Fudong Shao

[C2] **Community Mitigation: A Data-driven System for COVID-19 Risk Assessment in a Hierarchical Manner.**
*In Proceedings of The 30th ACM International Conference on Information and Knowledge Management (**CIKM 2021**)*
Yanfang Ye, Yujie Fan, Shifu Hou, Yiming Zhang, Yiyue Qian, Shiyu Sun, Qian Peng, Mingxuan Ju, Wei Song, Kenneth Loparo

[C1] **A Multi-representation Ensemble Approach to Classifying Vocal Diseases.**
*In Proceedings of 2018 IEEE International Confernece on Big Data (**BigData 2018**)*
Mingxuan Ju, Zhengkai Jiang, Yufan Chen, Soumya Ray

Journal Papers

[J3] **Exploring Contrast Consistency of Open-domain Question Answering Systems on Minimally Edited Questions.**
*Transactions of the Association for Computational Linguistics (**TACL**)*
Zhihan Zhang, Wenhao Yu, Ning Zheng, Mingxuan Ju, Meng Jiang

[J2] **a-Satellite: An AI-Driven System and Benchmark Datasets for Dynamic COVID-19 Risk Assessment in the United States**
*Journal of Biomedical and Health Informatics (**JBHI**)*
Yanfang Ye, Yujie Fan, Shifu Hou, Yiming Zhang, Yiyue Qian, Shiyu Sun, Qian Peng, Mingxuan Ju, Wei Song, Kenneth Loparo

[J1] **Development and Validation of a Machine Learning Algorithm for Predicting Response to Anticholinergic Medications for Overactive Bladder Syndrome.**
Obstetrics & Gynecology
David Sheyn, Mingxuan Ju, Sixiao Zhang, Caleb Anyaeche, Adonis Hijaz, Jeffrey Mangel, Sangeeta Mahajan, Britt Conroy, Sherif El-Nashar, Soumya Ray

Awards and Services

Awards:

- NeurIPS 2023 Student Scholar — Dec. 2023
- AAAI 2023 Student Scholar — Jan. 2023
- WWW 2021 Best Paper Award Shortlist — Mar. 2021
- 3rd Place Award at IEEE Big Data 2018 FEMH Cup — Jan. 2019
- Receiver of Support of Undergraduate Research and Creative Endeavors — Nov. 2018
- Dean's List — May 2016

Services:

- Organizer of Learning on Graph (LoG) conference mid-north meetup.
- Conference Reviewer/PC Member: ICLR 24/25; NeurIPS 23/24; ICML 24/25; AAAI 22/23/24/25; KDD 22/23/24; WWW 24; SDM 23/24/25; WSDM 22; ICDM 21/22; AISTATS 25.

Mentorship

- Mr. Donald Loveland (PhD student at University of Michigan at Ann Arbor, 2024-2025; Research Intern at Snap Inc., 2024)
- Ms. Jing Zhu (PhD student at University of Michigan at Ann Arbor, 2024-2025; Research Intern at Snap Inc., 2024-2025)
- Mr. Ngoc Bui (PhD student at Yale University, 2024-2025; Research Intern at Snap Inc., 2024)
- Mr. Haitao Mao (PhD student at Michigan State University, 2024-2025; Research Intern at Snap Inc., 2024-2025)

- Mr. Jingzhe Liu (PhD student at Michigan State University, 2024-2025)
- Mr. Zaiyi Zheng (PhD student at University of Virginia, 2024-2025)
- Ms. Runjin Chen (PhD student at University of Texas at Austin, 2024; Research Intern at Snap Inc., 2024)
- Ms. Xinyi Wu (PhD student at Massachusetts Institute of Technology, 2024; Research Intern at Snap Inc., 2024)
- Mr. Dimosthenis Antypas (PhD student at Cardiff University, 2024; Research Intern at Snap Inc., 2024)
- Mr. Norman Knyazev (PhD student at Radboud University, 2024; Research Intern at Snap Inc., 2024)
- Mr. Zheyuan Zhang (PhD student at University of Notre Dame, 2023-2024)
- Ms. Zhongyu Ouyang (PhD student at University of Notre Dame, 2023-2024)