

Mingxuan (Clark) Ju

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Research Scientist · Snap Inc., 110 110th Ave NE, Bellevue, WA 98004, USA

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Education

University of Notre Dame

Ph.D. in Computer Science & Engineering

Advisor: Dr. Yanfang (Fanny) Ye

Dissertation: Cost-effective Machine Learning Techniques for Graphs

Apr. 2020 – Nov. 2024

Notre Dame, IN

Case Western Reserve University

M.S. in Computer and Information Science

Jun. 2019 – Mar. 2020

Cleveland, OH

Case Western Reserve University

B.S. in Computer Science

Aug. 2015 – May 2019

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

Snap Research at Snap Inc., Manager: Dr. Neil Shah.

Mar. 2024 - Present

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

Snap Research at Snap Inc., Supervisors: Dr. Tong Zhao and Dr. Neil Shah.

Jun. 2023 – Oct. 2023

Seattle, WA

- Efficient GNNs for RecSys. Significant performance improvement (~**10%**) with only ~**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

University of Notre Dame, Supervisor: Dr. Fanny Ye.

Apr. 2020 – Present

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

Case Western Reserve University, Supervisor: Dr. Soumya Ray.

May 2017 – Mar. 2020

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

[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

[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] **Leveraging 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 Conference 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:

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| • 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)