

# Yao Ma

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## CONTACT INFORMATION

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## POSITIONS

**New Jersey Institute of Technology**, Newark, USA

- Assistant Professor, Department of Computer Science Sep 2021 –
- Faculty Collaborator, Institute for Data Science Sep 2021 –
- Affiliated Faculty Member, Institute for Space Weather Science Oct 2022 –

**Michigan State University**, East Lansing, USA

- Graduate Researcher, Department of Computer Science Jan 2017 – Jul 2021

**Snap Inc.**, Santa Monica, USA

- Research Intern, Snap Research May 2020 – Aug 2020

**JD.com**, Beijing, China

- Research Intern, Data Science Lab May 2018 – Aug 2018
- Research Intern, Data Science Lab Jul 2017 – Aug 2017

**Philips**, Eindhoven, the Netherlands

- Research Intern, Philips Research Jan 2016 – Oct 2016

## EDUCATION

**Michigan State University**, East Lansing, USA

- Ph.D. in Computer Science and Engineering Jul 2021

**Eindhoven University of Technology**, Eindhoven, the Netherlands

- M.S. in Statistics, Probability & Operations Research Oct 2016

**Zhejiang University**, Hangzhou, China

- B.S. in Mathematics & Applied Mathematics Jul 2015

## RESEARCH INTERESTS

- Machine Learning on Graphs, Graph Neural Networks
- Trustworthy AI: Robustness, Fairness, Privacy
- Data Centric-AI: Data Augmentation, Active Learning, Data Valuation, Data Condensation

## RESEARCH FUNDING

**NSF: Collaborative Research: III: Medium: Graph Neural Networks for Heterophilous Data: Advancing the Theory, Models, and Applications**

- \$1,200,000 (My share: \$400,000)
- 10/01/2022-09/30/2026
- Role: Site PI

**NSF: CRII:III: Towards Advanced Filtering and Pooling Operations for Graph Neural Networks**

- \$175,000
- 07/01/2022-06/30/2024

- Role: Sole PI

**NJIT Faculty Seed Grant:** *Securing Competitive Multi-agent Reinforcement Learning with Adversarial Attacks and Graph Learning*

- \$10,000 (My share: \$5,000)
- 07/01/2022-06/30/2023
- Role: Co-PI

**Katana Graph:** *Graph Neural Networks for Knowledge Graph Completion*

- \$30,000 (My share: \$15,000)
- 09/01/2021-08/30/2022
- Role: Lead PI

**Shell:** *Supply Chain Network Optimization*

- \$50,000
- 03/01/2023-02/29/2024
- Role: Sole PI

PUBLICATIONS See also [my google scholar](#) page.

### Books or Book Chapters

2. Yao Ma, Jiliang Tang. “Deep Learning on Graphs.” *Cambridge University Press*, 2021.
1. Yao Ma, Charu Aggarwal, Jiliang Tang. “Feature Engineering For Data Streams.” *Book Chapter in Feature Engineering, CRC Press*, 2017.

### Tutorials

4. Wei Jin, Yao Ma, Yiqi Wang, Xiaorui Liu, Jiliang Tang, Yukuo Cen, Jiezhong Qiu, Jie Tang, Chuan Shi, Yanfang Ye, Jiawei Zhang, Philip S. Yu. “Graph Representation Learning: Foundations, Methods, Applications and Systems.” *In Proceedings of the 27th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (KDD)*, 2021.
3. Yao Ma, Wei Jin, Yiqi Wang, Tyler Derr, Jiliang Tang. “Graph Neural Networks: Models and Applications.” *Tutorial Forum, AAAI Conference on Artificial Intelligence (AAAI)*, 2021.
2. Yao Ma, Yiqi Wang, Tyler Derr, Lingfei Wu, Tengfei Ma, Yu Rong, Tingyang Xu, Junzhou Huang, Wenbing Huang, Hong Cheng. “Deep Graph Learning: Foundations, Advances and Applications.” *In Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (KDD)*, 2020.
1. Yao Ma, Wei Jin, Jiliang Tang, Lingfei Wu, Tengfei Ma. “Graph Neural Networks: Models and Applications.” *Tutorial Forum, AAAI Conference on Artificial Intelligence (AAAI)*, 2020.

### Conference and Journal Publications

29. Khang Tran, Phung Lai, NhatHai Phan, Yao Ma, Abdallah Khreishah, Issa Khalil, My T. Thai, Xintao Wu. “Heterogeneous Randomized Response for Differential Privacy in Graph Neural Networks” *In Proceedings of the 2022 IEEE International Conference on Big Data, 2022*

28. Wei Jin, Xiaorui Liu, Yao Ma, Charu Aggarwal, Jiliang Tang. "Feature Over-correlation in Deep Graph Neural Networks: A New Perspective." *In Proceedings of the 28th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2022
27. Yao Ma, Xiaorui Liu, Neil Shah, Jiliang Tang. "Is Homophily a Necessity for Graph Neural Networks." *International Conference on Learning Representations (ICLR)*, 2022
26. Wei Jin, Xiaorui Liu, Xiangyu Zhao, Yao Ma, Neil Shah, Jiliang Tang. "Automated Self-Supervised Learning for Graphs." *International Conference on Learning Representations (ICLR)*, 2022
25. Xiaorui Liu, Jiayuan Ding, Wei Jin, Han Xu, Yao Ma, Zitao Liu, Jiliang Tang. "Graph Neural Networks with Adaptive Residual." *Conference on Neural Information Processing Systems (NeurIPS)*, 2021.
24. Yao Ma, Xiaorui Liu, Tong Zhao, Yozen Liu, Jiliang Tang. "A Unified View of Graph Neural Networks as Graph Signal Denoising." *In Proceedings of the 2021 ACM on Conference on Information and Knowledge Management (CIKM)*, 2021.
23. Wei Jin, Xiaorui Liu, Yao Ma, Tyler Derr, Charu Aggarwal, Jiliang Tang. "Graph Feature Gating Networks." *In Proceedings of the 2021 ACM on Conference on Information and Knowledge Management (CIKM)*, 2021.
22. Yao Ma, Suhang Wang, Tyler Derr, Lingfei Wu, Jiliang Tang. "Attacking Graph Convolutional Networks via Rewiring." *In Proceedings of 27th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2021.
21. Xiaorui Liu, Wei Jin, Yao Ma, Yaxin Li, Hua Liu, Yiqi Wang, Ming Yan, Jiliang Tang. "Elastic Graph Neural Networks." *International Conference on Machine Learning (ICML)*, 2021.
20. Wei Jin, Tyler Derr, Yiqi Wang, Yao Ma, Zitao Liu, Jiliang Tang. "Node Similarity Preserving Graph Convolutional Networks." *In Proceedings of the 14th International Conference on Web Search and Data Mining (WSDM)*, 2021.
19. Wenqi Fan, Tyler Derr, Xiangyu Zhao, Yao Ma, Hui Liu, Jianping Wang, Jiliang Tang, Qing Li. "CopyAttack: Attacking Black-box Recommendations via Copying Cross-domain User Profiles." *In Proceedings of the IEEE 37th International Conference on Data Engineering (ICDE)*, 2021.
18. Yao Ma, Juanhui Li, Yiqi Wang, Charu Aggarwal, Changdong Wang, Jiliang Tang. "Graph Pooling with Representativeness." *In Proceedings of 20th IEEE International Conference on Data Mining (ICDM)*, 2020.
17. Wentao Wang, Tyler Derr, Yao Ma, Suhang Wang, Hui Liu, Zitao Liu, Jiliang Tang. "Learning from Incomplete Labeled Data via Adversarial Data Generation." *In Proceedings of 20th IEEE International Conference on Data Mining (ICDM)*, 2020.
16. Wei Jin, Yao Ma, Xiaorui Liu, Xianfeng Tang, Suhang Wang, Jiliang Tang. "Graph Structure Learning for Robust Graph Neural Networks." *In Proceedings of 26th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2020.
15. Wenqi Fan, Yao Ma, Qing Li, Yuan He, Eric Zhao, Jiliang Tang, Dawei Yin. "A Graph Neural Network Framework for Social Recommendations." *IEEE Transactions on Knowledge and Data Engineering (TKDE)*, 2020.

14. Yao Ma, Ziyi Ding, Zhaochun Ren, Jiliang Tang, Dawei Yin. “Streaming Graph Neural Networks.” *In Proceedings of the 43rd International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR)*, 2020.
13. Xiaoyang Wang, Yao Ma, Yiqi Wang, Wei Jin, Xin Wang, Jiliang Tang, Caiyan Jia, Jian Yu. “Traffic Flow Prediction via Spatial Temporal Graph Neural Network.” *In Proceedings of the 29th International Conference on World Wide Web Companion (WWW)*, 2020.
12. Wenqi Fan, Yao Ma, Han Xu, Xiaorui Liu, Jianping Wang, Qing Li, Jiliang Tang. “Deep Adversarial Canonical Correlation Analysis.” *In Proceedings of the SIAM International Conference on Data Mining (SDM)*, 2020.
11. Han Xu, Yao Ma, Haochen Liu, Debayan Deb, Hui Liu, Jiliang Tang, Anil Jain. “Adversarial Attacks and Defenses in Images, Graphs and Text: A Review.” *International Journal of Automation and Computing*, 17(2), pp.151-178., 2020.
10. Tyler Derr, Yao Ma, Wenqi Fan, Xiaorui Liu, Charu Aggarwal, Jiliang Tang. “Epidemic Graph Convolutional Network.” *In Proceedings of the 13th ACM Conference on Web Search and Data Mining (WSDM)*, 2020.
9. Wenqi Fan, Yao Ma, Dawei Yin, Jianping Wang, Jiliang Tang, Qing Li. “Deep Social Collaborative Filtering.” *In Proceedings of the 13th ACM Conference on Recommender Systems (RecSys)*, 2019.
8. Wenqi Fan, Tyler Derr, Yao Ma, Dawei Yin, Jianping Wang, Jiliang Tang, Qing Li. “Deep Adversarial Social Recommendation.” *In Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI)*, 2019.
7. Yao Ma, Suhan Wang, Charu C. Aggarwal, Jiliang Tang. “Graph Convolutional Networks with EigenPooling.” *In Proceedings of 25th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD)*, 2019.
6. Wenqi Fan, Yao Ma, Qing Li, Yuan He, Eric Zhao, Jiliang Tang, Dawei Yin. “Graph Neural Networks for Social Recommendation.” *In Proceedings of the 28th International Conference on World Wide Web Companion (WWW)*, 2019.
5. Yao Ma, Suhan Wang, Charu C. Aggarwal, Dawei Yin, Jiliang Tang. “Multi-dimensional Graph Convolutional Networks.” *In Proceedings of SIAM International Conference on Data Mining (SDM)*, 2019.
4. Tyler Derr, Yao Ma, Jiliang Tang. “Signed Graph Convolutional Neural Networks.” *In Proceedings of the IEEE International Conference on Data Mining (ICDM)*, 2018.
3. Yao Ma, Suhan Wang, Jiliang Tang. “Local and Global Information Preserved Network Embedding.” *In Proceedings of IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)*, 2018.
2. Yao Ma, Zhaochun Ren, Ziheng Jiang, Dawei Yin, Jiliang Tang. “Multidimensional Network Embedding with Hierarchical Structures.” *In Proceedings of the 11th ACM International Conference on Web Search and Data Mining (WSDM)*, 2018.
1. Yao Ma, Suhan Wang, Jiliang Tang. “Network Embedding with Centrality Information.” *Ph.D Forum, The IEEE International Conference on Data Mining (ICDM)*, 2017.

#### Preprints and Submissions

7. Harry Shomer, Wei Jin, Juanhui Li, Yao Ma, Jiliang Tang. “Learning Representations for Hyper-Relational Knowledge Graphs.” *arXiv preprint arXiv:2208.14322*, 2022.

6. Hongliang Chi, Yao Ma. “Enhancing Graph Contrastive Learning with Node Similarity.” *arXiv preprint arXiv:2208.06743*, 2022.
5. Juanhui Li, Harry Shomer, Jiayuan Ding, Yiqi Wang, Yao Ma, Neil Shah, Jiliang Tang, Dawei Yin. “Are Graph Neural Networks Really Helpful for Knowledge Graph Completion?” *arXiv preprint arXiv:2205.10652*, 2022.
4. Juanhui Li, Yao Ma, Wei Zeng, Suqi Cheng, Jiliang Tang, Shuaiqiang Wang, Dawei Yin. “Graph Enhanced BERT for Query Understanding” *arXiv preprint arXiv:2204.06522*, 2022.
3. Yiqi Wang, Yao Ma, Charu Aggarwal, Jiliang Tang. “Non-IID Graph Neural Networks.” *arXiv preprint arXiv:2005.12386*, 2020.
2. Zhiwei Wang, Yao Ma, Zitao Liu, Jiliang Tang. “R-Transformer: Recurrent Neural Network Enhanced Transformer.” *arXiv preprint arXiv:1907.05572*, 2019.
1. Zhiwei Wang, Yao Ma, Jiliang Tang. “Linked Recurrent Neural Networks.” *arXiv preprint arXiv:1808.06170*, 2018.

#### HONORS & AWARDS

- Outstanding Graduate Student Award, College of Engineering (2019-20), MSU
- FAST Fellowship (2020-21), MSU
- Student Registration Award, KDD’2020
- Student Travel Grant, SIGIR’2020
- Student Travel Award, AAAI’2020
- Student Travel Award, KDD’2019
- Student Travel Award, SDM’2019
- ALSP scholarship, Eindhoven University of Technology, 2014-2016

#### TEACHING EXPERIENCE

Instructor, NJIT	
• CS 675 Introduction to Machine Learning	Fall, 2022
• CS 675 Introduction to Machine Learning	Spring, 2022
• CS 785 Deep Learning on Graphs	Fall, 2021
Teaching Assistant, MSU	
• Data Mining	2019
• Data Structures and Algorithms	2018
• Big Data Analysis	2018

#### MENTORING

<b>Data Analytics and Machine Intelligence Lab, NJIT</b>	
• Cong Qi, Ph.D. CS, NJIT	Sep 2022 –
• Jialiang Li, Ph.D. CS, NJIT	Sep 2022 –
• Hongliang Chi, Ph.D. CS, NJIT	Sep 2021 –
• Siqi Jiang, Ph.D. CS, NJIT	Jan 2022 –
• Atul Bhargav Kurumalla Srinivasa, M.S. DS, NJIT	Nov 2022 –
• Mike Jeong, B.S. CS, NJIT	Jan 2022 –
• Rajan Tripathi, B.S. CS, NJIT	Jan 2022 –
• Amanda Guan, High School Student	Jun 2022 –

**Data Science and Engineering Lab, MSU**

- Harry Shomer, Ph.D. CSE, MSU Oct 2021 –
- Juanhui Li, Ph.D. CSE, MSU Oct 2019 –
- Wei Jin, Ph.D. CSE, MSU Mar 2019 – Jun 2021
- Yiqi Wang, Ph.D. CSE, MSU Aug 2019 – Aug 2021
- Xiaoyang Wang, Ph.D. CS, Beijing Jiaotong University Dec 2018 – Dec 2019
- Wenqi Fan, Ph.D. CS, City University of Hong Kong Jun 2018 – Sep 2019
- Yongqi Han, B.S. CSE, MSU Nov 2018 – Dec 2019
- Charles L Green, B.S. EE&CS, PSU May 2019 – Jul 2019
- Hansheng Zhao, B.S. CSE, MSU Jan 2018 – Nov 2018
- Daniel Kobina Ofori-Dankwa, M.S. CSE, MSU Jan 2018 – May 2018

## SERVICES

**Grant Proposal Panelist**

- National Science Foundation (NSF) 2023

**Editors**

- *Machine Learning on Complex Graphs*, Frontiers in Big Data

**Book/Book Proposal Review**

- Cambridge University Press

**Conference and Workshop Chairships**

- Proceedings Co-chair, ACM Conference on Knowledge Discovery and Data Mining (KDD) 2022
- Workshop Organizer, Machine Learning on Graphs (MLog)@ICDM2022 2022
- Workshop Organizer, Machine Learning on Graphs (MLog)@WSDM2022 2022

**Session Chair**

- “Graph Mining” at KDD 2022 2022
- “Application: Social and Information Networks” at AAAI 2020 2020

**Senior Program Committee Member**

- AAAI Conference on Artificial Intelligence (AAAI) 2022
- International Joint Conferences on Artificial Intelligence (IJCAI) 2021

**Program Committee Member**

- The Web Conference (WWW) 2022
- International Conference on Machine Learning (NeurIPS) 2022
- International Conference on Machine Learning (ICML) 2021-2022
- SIGKDD Conference on Knowledge Discovery and Data Mining (KDD) 2021-2022
- International Conference on Learning Representations (ICLR) 2022
- International Conference on Information and Knowledge Management (CIKM) 2021
- International Joint Conferences on Artificial Intelligence (IJCAI) 2020
- Artificial Intelligence for Education (AI4EDU) @ AAAI 2020

- Deep Learning on Graphs: Methodologies and Applications (DLGMA) @ AAAI 2020
- AAAI Conference on Artificial Intelligence (AAAI) 2020 – 2021
- IEEE International Conference on Big Data (BigData) 2018 – 2021
- International Conference on Artificial Neural Networks (ICANN) 2019

#### **Journal Reviewer**

- IEEE Transactions on Knowledge and Data Engineering (TKDE)
- IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- IEEE Transactions on Big Data
- IEEE Transactions on Knowledge Discovery from Data (TKDD)
- Knowledge and Information Systems (KAIS)
- Neurocomputing
- Applied Network Science (ANS)
- IEEE Journal of Biomedical and Health Informatics
- Information Processing and Management (IPM)
- Transactions on the Web (TWEB)

#### **Volunteering**

- Annual Biomedical Research Conference for Minority Students (ABRCMS) Nov 2020
- 26th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD) Aug 2020
- 34th AAAI Conference on Artificial Intelligence (AAAI) Feb 2020
- 25th ACM SIGKDD Conference on Knowledge Discovery and Data Mining (SIGKDD) Aug 2019
- Mid-Michigan Symposium for Undergraduate Research Experiences (MID-SURE) Jul 2019
- 11th ACM International Conference on Web Search and Data Mining (WSDM) Feb 2018
- Volunteer of Summer Science Camp at Zhejiang University Jul 2013
- Organizer of a voluntary math teaching program for a primary school Sep 2012–Jul 2013