

XINYI WU

Curriculum Vitae (December 2023)
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EDUCATION

Massachusetts Institute of Technology (MIT)	Cambridge, MA
Institute for Data, Systems and Society (IDSS)	2020 —
Laboratory for Information and Decision Systems (LIDS)	
Ph.D. Program in Social & Engineering Systems	

Washington University in St. Louis	St. Louis, MO
Bachelor of Arts in Mathematics, <i>Summa Cum Laude</i>	2016 — 2020
Second major: Economics	

RESEARCH INTERESTS

I am broadly interested in network science, graph mining and machine learning on graphs. I have been working on large-scale network clustering and the theory of graph representation learning, with a recent focus on attention mechanisms in graph tasks. The questions I am interested in recently is why attention works for graph tasks, what is the difference between local and global graph attention, and how to design effective and efficient attention mechanism on graphs in a principled way. My research has enabled me to have strong skills in both quantitative analysis and practical implementation.

PUBLICATIONS

3. **X. Wu**, A. Ajorlou, Z. Wu, A. Jadbabaie, “Demystifying Oversmoothing in Attention-Based Graph Neural Networks.” *Proceedings of the 37th Conference on Neural Information Processing Systems (NeurIPS, **spotlight**)*, 2023.
 - **Oral** presentation at Learning on Graphs Conference (LOG), 2023.
 - **Oral** presentation at Conference on the Mathematical Theory of Deep Neural Networks (DeepMath), 2023.
2. **X. Wu**, Z. Chen, W. W. Wang, A. Jadbabaie, “A Non-Asymptotic Analysis of Oversmoothing in Graph Neural Networks.” *Proceedings of the 11th International Conference on Learning Representations (ICLR)*, 2023.
1. **X. Wu**, A. Sarker, A. Jadbabaie, “Link Partitioning on Simplicial Complexes Using Higher-Order Laplacians.” *Proceedings of the 22nd IEEE International Conference on Data Mining (ICDM)*, 2022.

HONORS

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| • NeurIPS 2023 Top Reviewer | 2023 |
| • IEEE ICDM Student Travel Award | 2022 |
| • Michael Hammer Fellowship, MIT | 2020 |
| • Phi Beta Kappa, Beta of Missouri at Washington University | 2020 |
| • Highest Distinction in Mathematics, Washington University in St. Louis | 2020 |
| • Distinction in Economics, Washington University in St. Louis | 2020 |
| • Ross Middlemiss Prize in Mathematics, Washington University in St. Louis | 2020 |
| • Brian Blank Prize in Mathematics, Washington University in St. Louis | 2019 |

PROJECTS

Research Collaboration with Liberty Mutual Group

Fall 2022 —

- Analyze network data associated with surety contracts to augment existing risk measures; report data-driven insights to key stakeholders

TEACHING

Instructor for MIT IDSS Math Camp

Summer 2023

TA for 1.022 Introduction to Network Models (MIT)

Fall 2021, Fall 2022, Fall 2023

SERVICE

Reviewer for ICLR 2024, NeurIPS 2023, PAKDD 2023

SKILLS

Programming

- Python, PyTorch, MATLAB, R, Java, C++, STATA, \LaTeX

Languages

- English (fluent), Chinese (native), French (advanced)