Yinan Huang

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Education

Georgia Institute of Technology, USA, Ph.D. in Machine Learning — Sept 2023 – 2027 (Expected)
- Advisor: Pan Li

Duke University, USA, M.S. in Electrical and Computer Engineering — Sept 2020 - May 2023
- GPA: 4.0/4.0

Sun Yat-sen University, China, B.S. in Physics — Sept 2016 - May 2020
- GPA: 4.3/5.0, Rank: 1/83

Research Interests

Generative Models: diffusion model/flow matching

Geometric Deep Learning: graph neural networks, equivariant neural networks, AI for science

Trustworthy AI: privacy-preserving deep learning

Research Experience

Research Assistant, Georgia Institute of Technology — Sept 2023 –
- Stable and expressive positional encodings for undirected and directed graphs (ICLR 2024, ICLR 2025)
- Developed a differentially private training algorithm for relational learning with rigorous entity-level privacy guarantees (NeurIPS 2025)
- Efficient diffusion and flow-matching models for online forecasting, tracking, and control (ongoing)

Research Intern, Peking University — Feb 2022 – Sept 2022
- Revealed fundamental limitations of subgraph neural networks in capturing graph substructures, and developed an efficient node labeling method to enhance their expressive power (ICLR 2023)

Research Intern, Beijing Institute for General Artificial Intelligence — Sept 2021 – Feb 2022
- Developed E(3)-equivariant generative models that incorporate molecular geometry for drug discovery (ICML 2022, Oral)

Publications

[1] Differentially Private Relational Learning with Entity-level Privacy Guarantees
Yinan Huang*, Haoteng Yin*, Eli Chien, Rongzhe Wei, Pan Li
Advances in Neural Information Processing Systems (NeurIPS), 2025.

[2] GenAI Copyright Evidence with Operational Meaning
Eli Chien, Amit Saha, ***Yinan Huang***, Pan Li
ICML Workshop on Reliable and Responsible Foundation Models, 2025

[3] What Are Good Positional Encodings for Directed Graphs?
Yinan Huang, Haoyu Wang, Pan Li
International Conference on Learning Representations (ICLR), 2025.

[4] On the Stability of Expressive Positional Encodings for Graphs
Yinan Huang*, William Lu*, Joshua Robinson, Yu Yang, Muhan Zhang, Stefanie Jegelka, Pan Li
International Conference on Learning Representations (ICLR), 2024.

[5] Is Distance Matrix Enough for Geometric Deep Learning?

Zian Li, Xiyuan Wang, ***Yinan Huang***, Muhan Zhang
Advances in Neural Information Processing Systems (NeurIPS), 2023.

[6] Boosting the Cycle Counting Power of Graph Neural Networks with I^2-GNNs
Yinan Huang, Xingang Peng, Jianzhu Ma, Muhan Zhang
International Conference on Learning Representations (ICLR), 2023.

[7] 3DLinker: An E(3) Equivariant Variational Autoencoder for Molecular Linker Design
Yinan Huang, Xingang Peng, Jianzhu Ma, Muhan Zhang
*International Conference on Machine Learning (ICML), 2022 (**Oral**).*

Preprints

[1] Powers of Magnetic Graph Matrix: Fourier Spectrum, Walk Compression, and Applications
Yinan Huang, David F Gleich, Pan Li
https://arxiv.org/abs/2506.07343

[2] What Can We Learn from State Space Models for Machine Learning on Graphs?
Yinan Huang*, Siqi Miao*, Pan Li
https://arxiv.org/abs/2406.05815

[3] A Benchmark on Directed Graph Representation Learning in Hardware Designs
Haoyu Wang, ***Yinan Huang***, Nan Wu, Pan Li
https://arxiv.org/abs/2410.06460

Honors and Awards

- Travel Award for ICLR 2025
- Georgia Tech ECE Fellowship 2023
- China National Scholarship 2017

Professional Service

- Reviewer for International Conference on Machine Learning (ICML) 2023-2025
- Reviewer for International Conference on Learning Representations (ICLR) 2024-2025
- Reviewer for Advances in Neural Information Processing Systems (NeurIPS) 2023-2026
- Program Committee for Association for the Advancement of Artificial Intelligence (AAAI) 2026
- Reviewer for Association for Computing Machinery's Special Interest Group on Knowledge Discovery and Data Mining (KDD) 2026
- Reviewer for Autonomous Robots
- Teaching Assistant: ECE 3077 Introduction to Probability and Statistics, ECE 6250 Advanced Digital Signal Processing

Skills

- Programming languages and frameworks: Python, Pytorch, Matlab, C