

Yiming Huang

IMPERIAL · DEPARTMENT OF COMPUTING

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Research

My research interests primarily focus on developing novel topological deep learning methods for understanding complex and higher-order graph structures. I am also interested in generative models, graph representation learning, higher-order network analysis, and their interdisciplinary applications.

- Topological Deep Learning (TDL)
- Graph Representation Learning
- Higher-order Network Analysis
- Generative Models

Education

Imperial College London

PH.D IN COMPUTER SCIENCE

London, UK

Sep. 2024 - Present

- Supervised by [Prof. Tolga Birdal](#)
- Awarded the Lee Family Scholarship (two recipients annually across Imperial)

UESTC (University of Electronic Science and Technology of China)

M.SC. IN COMPUTER SCIENCE

Chengdu, China

Sep. 2021 - Jun. 2024

- Supervised by [Prof. Linyuan Lü](#)

NUIST (Nanjing University of Information Science and Technology)

B.S. IN COMPUTER SCIENCE

Nanjing, China

Sep. 2017 - Jun. 2021

Publications

(*: Equal contribution)

HOG-Diff: Higher-Order Guided Diffusion for Graph Generation

[Yiming Huang](#), Tolga Birdal

arXiv preprint arXiv:2502.04308, 2025 [\[Paper\]](#)

TLDR: We introduce, HOG-Diff, a coarse-to-fine graph generation framework that explicitly exploits higher-order topological cues.

Key words: Topological Deep Learning, Generative Model

Cellular-Guided Graph Generative Model

[Yiming Huang](#), Tolga Birdal

ICLR 2025 Workshop on Deep Generative Model in Machine Learning: Theory, Principle and Efficacy, 2025 [\[Paper\]](#)

Key words: Topological Deep Learning, Generative Model

Higher-Order Graph Convolutional Network with Flower-Petals Laplacians on Simplicial Complexes

[Yiming Huang*](#), Yujie Zeng*, Qiang Wu, Linyuan Lü

Proceedings of the AAAI conference on artificial intelligence (AAAI), 2024 [\[Paper\]](#) [\[Poster\]](#)

Key words: Topological Deep Learning, Graph Representation Learning, Network Science

Identifying key players in complex networks via network entanglement

[Yiming Huang](#), Hao Wang, Xiao-Long Ren, Linyuan Lü

Communications Physics p. 19, 2024 [\[Paper\]](#)

Key words: Network Science, Influence Maximization

Influential simplices mining via simplicial convolutional networks

Yujie, Zeng*, [Yiming Huang*](#), Qiang Wu, Linyuan Lü

Information Processing & Management p. 103813, 2024 [\[Paper\]](#)

Key words: Topological Deep Learning, Graph Representation Learning, Network Science

Identifying vital nodes through augmented random walks on higher-order networks

Yuejie, Zeng*, [Yiming Huang*](#), Xiao-Long Ren, Linyuan Lü

Information Sciences p. 121067, 2024 [\[Paper\]](#)

Key words: Network Science, Influence Maximization

Cooperative Network Learning for Large-Scale and Decentralized Graphs

Qiang Wu*, Yiming Huang*, Yujie Zeng, Linyuan Lü

arXiv preprint arXiv:2311.02117. 2023 [\[Paper\]](#)

Key words: Graph Representation Learning, Network Science

A novel coherence-based quantum steganalysis protocol

Zhiguo Qu, Yiming Huang, Min Zheng

Quantum Information Processing p. 362. 2020 [\[Paper\]](#)

Key words: Quantum Computing

Presentations

Influential Simplices Mining via Simplicial Convolutional Network

Vienna, Austria

NETSCI 2023

Jul. 2023

HiGCN: Higher-order Graph Convolutional Network with Flower-Petals Laplacians on Simplicial Complexes

Chongqing, China

CNETSCI 2023

May 2023

Identifying key players in complex networks through network entanglement

Shanghai, China

NETSCI 2022

Jul. 2022

Projects

Topological Deep Learning and Graph Generative Models

Imperial, UK

Sep. 2024 - Present

- Designing diffusion-based graph generative models guided by higher-order topological structures.

Graph Representation Learning and Higher-order Network Analysis

Yangtze Delta Region Institute
(Huzhou) & UESTC, China

Sep. 2022 - Jun. 2024

- Developed novel higher-order representations and higher-order graph neural network model.
- Contributed to the Chinese monograph *Graph Machine Learning*; collaborated with Prof. Jure Leskovec.

Network Robustness and Influence Maximization Analysis

UESTC, China

Sep. 2021 - Sep. 2022

- Investigated network robustness and influence dynamics using higher-order structures and physics-inspired models.

Honors & Awards

Awards: 1 international award, more than 10 provincial and above awards; 7 patents; 1 national research project.

2024 **Lee Family Scholarship**, (Top 2, two recipients annually across Imperial)

Imperial

2023 **Gold Prize**, “Internet+” College Students Innovation and Entrepreneurship Competition (Top 1%)

2021 **Honor Graduate**, (Top 10%)

NUIST

2020 **Finalist**, Mathematical Contest In Modeling (MCM) (Top 1%)

2020 **Project Leader**, National Training Program of Innovation and Entrepreneurship for Undergraduates

Academic Services

Conference Reviewing ICML 2025, ICLR 2025

Journal Reviewing IEEE Transactions on Artificial Intelligence (TAI), Entropy, Journal of Computational Science, Applied Sciences, International Journal of Modern Physics C

Skills

Programming Python (PyTorch, Networkx, Numpy), MatLab, Java, C, C++

Tools \LaTeX , Anaconda, Adobe Illustrator, Git, Gephi, Origin, SPASS, etc.