Hang Du

Email: hangdu@mit.edu

Education

Sept. 2019 - July. 2023 Undergraduate	School of Mathematical Sciences Peking University (PKU)
Sept. 2023 - Present Ph.D Candidate	Department of Mathematics Massachusetts Institute of Technology (MIT)
Research Interests	Probability theory, statistical physics, combinatorial statistics

Research works (in reverse chronological order)

Characterizing the limiting critical Potts measures on locally regular-tree-like expander graphs
With Y. Zhou, submitted.

The asymptotic diameter of the preferential attachment model
With S. Gong, Z. Li and H. Zhu, submitted.

Sharp network recovery threshold from voter model dynamics
With S. Ha and O. Sole-Pi, submitted.

Optimal recovery of correlated Erdős-Rényi graphs
Submitted.

A proof of the changepoint detection threshold conjecture in preferential attachment models
With S. Gong and J. Xu, *38th Conference on Learning Theory*.

Low-degee hardness of detection for correlated Erdős–Rényi graphs
With J. Ding and Z. Li, *Annals of Statistics*.

The algorithmic phase transition of random graph alignment problem
With S. Gong and R. Huang, *Probability Theory and Related Fields*.

Percolation threshold for metric graph loop soup
With Y. Chang and X. Li, *Bernoulli*.

A Polynomial-time approximation scheme for the maximal overlap of two independent Erdős–Rényi graphs
With J. Ding and S. Gong, *Random Structures and Algorithms*.

Sharp estimates for probabilities of arm events in critical plannar percolation
With Y. Gao, X. Li and Z. Zhuang, *Communications in Mathematical Physics*.

Matching recovery threshold for correlated random graphs
With J. Ding, *Annals of Statistics*.

Detection threshold for correlated Erdős-Rényi graphs via densest subgraphs
With J. Ding, *IEEE Transanction on Information Theory*.

Invited research talks

AMSS stochastic analysis seminar (Chinese Academy of Sciences), Optimal spectral algorithms for high-dimensional statistical inference, January 2026.

Peking University Probability seminar, Recent progress of Potts and random cluster models on locally tree-like graphs, January 2026.

Westlake University ITS seminar, Recent progress of Potts and random cluster models on locally tree-like graphs, January 2026.

MIT Probability seminar, Recent progress of Potts and random cluster models on locally tree-like graphs, December 2025.

An International Conference on Applied Probability (Peking University), Optimal recovery of correlated Erdős-Rényi graphs, June 2025.

AIM workshop on low-degree polynomial methods in average-case complexity, Low-degree hardness of detecting correlated graphs, December 2024.

IMS-China International Conference on Probability and Statistics, Matching two independent random graphs: informational and computational thresholds, July 2024.

NYU Shanghai special math seminar, Informational thresholds for questions in the correlated random graph model, May 2023.

Sichuan University probability seminar, Informational thresholds for questions in the correlated random graph model, April, 2023.

THU-PKU-BNU joint probability webinar, Random graph matching problem and some recent progresses, Oct 2022.

Reviewing

Joournals: Annals of Probability, Annals of Statistics, Annals of Applied Probability, Communications in Mathematical Physics, IEEE Transaction on Information Theory.
Conferences: SODA (2024), FOCS (2025).

Honors & Awards

Gold Medal **(first place)** in the 13th S.-T. Yau College Mathematics Contests Team medals
First Prize (**Rank 1**) in the 13th National College Student Mathematics Contest
National Scholarship (the **highest honor** for college students in China) at Peking University
Gold Medal **(Rank 5)** in the 34th China Mathematical Olympiad

Skills

C++, Python, Mathematica, Matlab.