JIAXI NIE

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Research interests

My research interests lie mainly in extremal combinatorics and probabilistic combinatorics, but I keep my brain open for any interesting math problems.

Positions

Visiting Assistant Professor, Georgia Institute of Technology
Supervisor: Xiaoyu He 2024 August – present

Postdoctoral Researcher, Shanghai Center for Mathematical Sciences
Supervisor: Hehui Wu 2022 September – 2024 July

Short-term postdoc, Max Planck Institute for Mathematics in the Sciences
Supervisor: Raffaella Mulas 2022 May-August

Education

Ph.D. in Mathematics, University of California, San Diego 2016 – 2022
Advisor: Jacques Verstraëte. *GPA: 4.00/4.00*

B.S. in Mathematics, Nankai University 2012 – 2016
GPA: 90.41/100

Exchange Semester, University of California, Berkeley 2014 Fall
GPA: 4.00/4.00

Papers

26. Decomposition of Cliques into k-Star-Forests (With Y. Ren and H. Wu)
Submitted. arxiv.

25. Maximum in-general-position set in a random subset of $\mathbb{F}_q^d$ (With Y. Chen, J. Yu and W. Zhang)
Submitted. arxiv.

24. Off-Diagonal Ramsey Numbers for Linear Hypergraphs (With X. He, Y. Wigderson and H. Yu)
Submitted. arxiv.

23. Generalized Erdős-Rogers problems for hypergraphs (With X. He)
Submitted. arxiv.

22. Supersaturation of odd linear cycles (With L. Deng, J. Han and S. Spiro)
Submitted. arxiv.

21. Random Turán Problems for $K_{s,t}$ Expansions (With S. Spiro)
Submitted. arxiv.

20. Random Turán Problems for Hypergraph Expansions. (With S. Spiro)
Submitted. arxiv.

19. Evasive sets, twisted varieties, and container-clique trees (With J. Lim and J. Zeng)
SODA 2026. arxiv.

18. On the Matching Problem in Random Hypergraphs (With P. Frankl and J. Wang)
To appear on Discrete Mathematics. arxiv.

17. On tight tree-complete hypergraph Ramsey numbers
To appear on Journal of Graph Theory. arxiv.

16. On odd covers of cliques and disjoint unions. (with C. Buchanan, A. Clifton, E. Culver, P. Frankl, K. Ozeki, P. Rombach, and M. Yin)
To appear on Journal of Graph Theory. arxiv.

15. Random Turán theorem for expansions of spanning subgraphs of tight trees.
To appear on SIAM Journal on Discrete Mathematics. arxiv.

14. Sidorenko Hypergraphs and Random Turán Numbers. (With S. Spiro)
To appear on Combinatorial Theory. arxiv.

13. Random Turán and counting results for general position sets over finite fields. (with Y. Chen, X. Liu, and J. Zeng)
SCIENCE CHINA Mathematics (2025). arxiv.

12. The Number of Edge Colorings with Small Independence Number and No Monochromatic H. (with X. Hu and Q. Lin)
The Electronic Journal of Combinatorics 32.1 (2025). arxiv.

11. Off-diagonal Ramsey number for slowly growing hypergraphs (with S. Mattheus, D. Mubayi and J. Verstraëte)
Random Structures & Algorithms 66.1 (2025): e21284. arxiv.

10. Turán theorems for even cycles in random hypergraph.
Journal of Combinatorial Theory, Series B 167 (2024): 23-54. arxiv.

9. On asymptotic local Turán problems. (with P. Frankl)
The Moscow Journal of Combinatorics and Number Theory, 2023, 12(4): 273-286. arxiv.

8. On asymptotic packing of convex geometric and ordered graphs. (with E. Surya, and J. Zeng)
Journal of Graph Theory (2023), 1–15. arxiv.

7. Odd Covers of Graphs. (with C. Buchanan, A. Clifton, E. Culver, J. O'Neill, P. Rombach, and M. Yin)
Journal of Graph Theory (2023), 104: 420–439. arxiv.

6. On Turán numbers for disconnected hypergraphs. (with R. Mulas)
Acta Mathematica Hungarica 170, 168–182 (2023). arxiv.

5. On Asymptotic Packing of Geometric Graphs. (with D. Cranston, J. Verstraëte, and A. Wesolek)
Discrete Applied Mathematics 322 (2022): 142-152. arxiv.

4. Maximal independent sets in clique-free graphs. (with X. He, and S. Spiro)
European Journal of Combinatorics 106 (2022): 103575. arxiv.

3. Ramsey Numbers for Non-trivial Berge Cycles. (with J. Verstraëte)
SIAM Journal on Discrete Mathematics 36.1 (2022): 103-113. arxiv.

2. Triangle-free Subgraphs of Hypergraphs. (with S. Spiro, and J. Verstraëte)
Graphs and Combinatorics 37 (2021): 2555-2570. arxiv.

1. Randomized greedy algorithm for independent sets in regular uniform hypergraphs with large girth. (with J. Verstraëte)
Random Structures & Algorithms 59.1 (2021): 79-95. arxiv.

Teaching

As Instructor

at Georgia Institute of Technology:

3406 - A second course on Linear Algebra	Fall 2025
4032 - Combinatorial Analysis	Spring 2025
3012 - Applied Combinatorics	Fall 2024

at Fudan University:

Graph Theory	Fall 2023

at UCSD

MATH 20C - Calculus&Analyt Geom/Sci&Engnr	Summer I 2021

As Teaching Assistant at UCSD

MATH 154 - Discrete Math & Graph Theory	Winter 2022
MATH 154 - Discrete Math & Graph Theory	Winter 2021
MATH 154 - Discrete Math & Graph Theory	Fall 2020
MATH 20E - Vector Calculus	Summer II 2020
MATH 154 - Discrete Math & Graph Theory	Spring 2020
MATH 154 - Discrete Math & Graph Theory	Winter 2020
MATH 170A - Intro Numerical Analys/Linear	Fall 2019
MATH 220C - Complex Analysis	Spring 2019
MATH 18 - Linear Algebra	Spring 2019
MATH 170B - Intro/Numerical Analy/Approxim	Winter 2019
MATH 170A - Intro Numerical Analys/Linear	Fall 2018
MATH 142A - Introduction to Analysis I	Summer I 2018
MATH 184A - Combinatorics	Spring 2018
MATH 184A - Combinatorics	Winter 2018
MATH 184A - Combinatorics	Fall 2017
MATH 20B - Calculus/Science & Engineering	Winter 2017
MATH 20A - Calculus/Science & Engineering	Fall 2016

Service

Co-orgarnizing the GaTech Combinatorics Seminar
Co-orgarnizing the SCMS Combinatorics Seminar
Served as referee for the following journals:
Forum of Mathematics Sigma, Journal of London Mathematical Society, Journal of Combinatorial Theory Series B, Combinatorica, Random Structures & Algorithms, SIAM Journal of Discrete Mathematics, Journal of Graph Theory, European Journal of combinatorics, Discrete Applied Mathematics, Australasian Journal of Combinatorics, Journal of Combinatorial Optimization, Discrete Mathematics, Graphs and Combinatorics.