

Xizhi Liu

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Education

- 2018.08–2022.05: Ph.D. in Mathematics, University of Illinois at Chicago (UIC).
- 2014.08–2018.05: B.S. in Mathematics and Applied Mathematics, University of Science and Technology of China (USTC).

Fields of Interest

- Extremal Combinatorics (extremal graph/hypergraph/set theory) and Theoretical Computer Science.

Employment History

- 2022.04–2026.04: Research Fellow, University of Warwick

Teaching

- 2018 Fall, Math 310, Applied Linear Algebra, Teaching Assistant, UIC.
- 2019 Spring, Math 310, Applied Linear Algebra, Teaching Assistant, UIC.
- 2019 Fall, Math 110, College Algebra, Teaching Assistant, UIC.
- 2020 Spring, Math 165, Calculus for Business, Teaching Assistant, UIC.
- 2022 Fall, Extremal Combinatorics (online Zoom), Fuzhou University, (Instructor).
- 2023 Aug 21-25, Minicourse on Extremal Hypergraph Theory, Suzhou University, (Instructor).

Awards/Fellowships/Grants

- 2021–2022: Dean's Scholar Fellowship, UIC.
- 2022: Outstanding Thesis and Dissertation Award, UIC.

Last Updated: November 13, 2023

Talks

- 01/2019: Seminar, School of Mathematical Sciences, University of Science and Technology, Hefei, China.
- 06/2019: Seminar, School of Mathematical Sciences, University of Science and Technology, Hefei, China.
- 07/2020: Seminar, School of Mathematical Sciences, East China Normal University, Shanghai, China, online Zoom.
- 08/2020: Combinatorics Literature Seminar at UIUC (University of Illinois Urbana-Champaign), online Zoom.
- 10/2020: UIC (University of Illinois at Chicago) Graduate Combinatorics Seminar, online Zoom.
- 02/2021: Seminar, School of Mathematical Sciences, Shangdong University, Jinan, China, online Zoom.
- 03/2021: SCMS (Shanghai Center for Mathematical Sciences) Combinatorics Seminar, Shanghai, China, online Zoom.
- 05/2021: EPC (Extremal and Probabilistic Combinatorics) Webinar, online Zoom.
- 09/2021: Georgia Tech Graph Theory Seminar, Atlanta, US.
- 10/2021: Seminar, Center for Discrete Mathematics and Theoretical Computer Science, Fuzhou University, Fujian, China.
- 01/2022: Seminar, School of Mathematical Sciences, Shangdong University, Jinan, China.
- 03/2022: Seminar, Center for Discrete Mathematics and Theoretical Computer Science, Fuzhou University, Fujian, China.
- 04/2022: Warwick Combinatorics seminar, University of Warwick, Coventry, UK.
- 06/2022: IBS Discrete Math seminar, Korea, online Zoom.
- 07/2022: The Second Armenian Workshop On Graphs, Combinatorics, Probability, and their application to machine learning.
- 07/2022: Seminar, Data Science Institute, Shangdong University, Jinan, China, online Zoom.
- 08/2022: Extremal Combinatorics and Geometry workshop, Banff, Canada, online Zoom.
- 11/2022: Combinatorics Seminar, UCL, London, UK.
- 03/2023: Seminar, School of Mathematical Sciences, East China Normal University (ECNU), Shanghai, China.
- 03/2023: Seminar, Taiyuan University of Technology, Taiyuan, China, online.
- 04/2023: The Seventh Workshop on Graph Theory and Combinatorics, Shanghai Jiao Tong University (SJTU), Shanghai, China.
- 04/2023: SCMS (Shanghai Center for Mathematical Sciences) Combinatorics Seminar, Shanghai, China.
- 08/2023: Combinatorics seminar, Nankai University, Tianjin, China.

Conferences/Workshops

- *Atlanta Lecture Series in Combinatorics and Graph Theory XXIII*, March 30-31, 2019, Georgia Institute of Technology.
<http://people.math.gatech.edu/mwgal3/ALSXXIII.html>
- *6th Lake Michigan Workshop on Combinatorics and Graph Theory*, April 6-7, 2019, Western Michigan University.
<http://homepages.wmich.edu/zyb1431/workshop2019/>
- *Birmingham-Warwick One-Day Combinatorics Meeting*, July 14, 2022, University of Warwick, UK.
<https://warwick.ac.uk/fac/sci/math/research/events/events2021-22/bhamwarwickcombinatorics/>
- *The Second Armenian Workshop On Graphs, Combinatorics, Probability, and their application to machine learning*, July 3-9, 2022, Yenokavan, Armenia.
<https://perouz.github.io/gcp2022/>
- *Extremal Combinatorics and Geometry (22w5009)*, Aug. 14-19, 2022, Banff, Canada.
<http://www.birs.ca/events/2022/5-day-workshops/22w5009>
- *Workshop on Graph Theory I*, Mar. 18-19, 2023, SCMS, Shanghai, China.
<https://scms.fudan.edu.cn/info/4502/5583.htm>
- *Workshop on Ramsey–Turán and related Problems*, Mar. 24-26, 2023, Fuzhou, China.
<https://dimacs.fzu.edu.cn/info/1012/1701.htm>
- *The Seventh Workshop on Graph Theory and Combinatorics*, Apr. 16-17, 2023, Shanghai Jiao Tong University (SJTU), Shanghai, China.
- *An Autumn Day of Combinatorics*, Nov. 03, 2023, University of Birmingham, UK.

Publications

Submitted

- Cancellative hypergraphs and Steiner triple systems, (29 pages), preprint available at <http://arxiv.org/abs/1912.11917>.
- Turán problems in pseudorandom graphs, (with D. Mubayi) (13 pages), preprint available at <https://arxiv.org/abs/2209.12103>.
- Finite hypergraph families with rich extremal Turán constructions via mixing patterns, (with O. Pikhurko) (57pp), preprint available at <https://arxiv.org/abs/2212.08636>.
- A step towards a general density Corrádi–Hajnal Theorem, (with J. Hou, H. Li, L.-T. Yuan, and Y. Zhang) (32pp), preprint available at <https://arxiv.org/abs/2302.09849>.
- Random Turán and counting results for general position sets over finite fields, (with Y. Chen, J. Nie, and J. Zeng) (28pp), preprint available at <https://arxiv.org/abs/2309.07744>.
- Exact results for some extremal problems on expansions I, (with J. Song) (49pp), preprint available at <https://arxiv.org/abs/2310.01736>.
- Hypergraph anti-Ramsey theorems, (with J. Song) (14pp), preprint available at <https://arxiv.org/abs/2310.01186>.

Accepted

- d -cluster-free sets with a given matching number, (19 pages), *European J. Combin.*, 82:103000, 2019.
- Structural results for conditionally intersecting families and some applications, (13 pages), *Electron. J. Combin.*, 33(2), 2020.
- New short proofs to some stability theorems, (8 pages), *European J. Combin.*, 96:103350, 2021
- The feasible region of hypergraphs, (with D. Mubayi), *J. Combin. Theory, Ser. B*, 148:23 - 59, 2021.
- Tight bounds for Katona's shadow intersection theorem, (with D. Mubayi) (17 pages), *European J. Combin.*, 97:103391, 2021.
- Independent sets in hypergraphs omitting an intersection, (with T. Bohman and D. Mubayi), *Random Structures Algorithms* 61 (2022), no. 3, 493–519.
- A hypergraph Turán problem with no stability, (with D. Mubayi), *Combinatorica* 42 (2022), no. 3, 433–462.
- Sparse halves in K_4 -free graphs, (with J. Ma) (19 pages), *J. Graph Theory* 99 (2022), no. 1, 5-25.
- On a generalized Erdős-Rademacher problem, (with D. Mubayi), *J. Graph Theory* 100 (2022), no. 1, 101-126.
- On explicit constructions of designs, (with D. Mubayi), *Electron. J. Combin.* 29 (2022), no. 1, Paper No. 1.53, 11 pp.
- Hypergraphs without non-trivial intersecting subgraphs, *Combinatorics, Probability and Computing* (2022), 1-16.
- Tight query complexity bounds for learning graph partitions, (with S. Mukherjee) (14 pages), *35th Annual Conference on Learning Theory (COLT 2022)*.
- A unified approach to hypergraph stability, (with D. Mubayi and C. Reiher), *J. Combin. Theory Ser. B* 158 (2023), 36–62.
- The feasible region of induced graphs, (with D. Mubayi and C. Reiher), *J. Combin. Theory Ser. B* 158 (2023), 105–135.
- Stability theorems for some Kruskal-Katona type results, (with S. Mukherjee), *European J. Combin.* 110:103666, 2023.
- Hypergraphs with many extremal configurations, (with D. Mubayi and C. Reiher), *Israel. J. Math.*
- Hypergraph Turan densities can have arbitrarily large algebraic degree, (with O. Pikhurko), *J. Combin. Theory Ser. B* 161(2023), 407-416.
- Hypergraphs with infinitely many extremal constructions, (with J. Hou, H. Li, D. Mubayi, and Y. Zhang), *Discrete Analysis*.