Yifan Jing

yifan.jing@maths.ox.ac.uk
Mathematical Institute, University of Oxford, UK, OX2 6GG

RESEARCH INTERESTS

Arithmetic Combinatorics and its intersections with Algebraic Geometry, Group Theory and Lie Theory,
Abstract Harmonic Analysis, Number Theory, Representation Theory, and Model Theory.
Analytic and Combinatorial aspects of Number Theory.
Extremal Combinatorics, Discrete Probability, and Graph Theory.
Harmonic Analysis on Euclidean spaces, especially its intersection with Incidence Geometry.

EMPLOYMENT

Junior Research Fellow   12/2022–7/2024
Wolfson College, University of Oxford, UK

Postdoctoral Research Associate   10/2021–7/2024
Mathematical Institute, University of Oxford, UK

EDUCATION

Ph.D in Mathematics   8/2018–6/2021
University of Illinois Urbana-Champaign (UIUC), Urbana, IL, USA
    Advisor: JÓZSEF BALOGH and XIAOCHUN LI
    Thesis: Some arithmetic Ramsey problems and inverse theorems

M.Sc in Mathematics   8/2016–6/2018
Simon Fraser University (SFU), Burnaby, BC, Canada
    Advisor: BOJAN MOHAR
    Thesis: The genus of generalized random and quasirandom graphs

B.S in Mathematics   8/2012–6/2016
University of Science and Technology of China (USTC), Hefei, Anhui, China
Hua Loo-Keng Talent Program in Mathematics (Honors Program)
    Advisor: JACK KOOLEN
    Thesis: Distance-regular graphs with bounded smallest eigenvalues

PUBLISHED & ACCEPTED PAPERS

1. Yifan Jing, Chieu-Minh Tran, and Ruixiang Zhang, "A nonabelian Brunn–Minkowski inequality", **Geometric and Functional Analysis**, 33(4) 1048–1100 (2023).

2. Yangyang Cheng, Yifan Jing, Lina Li, Guanghui Wang, and Wenling Zhou, "Integer colorings with forbidden rainbow sums", **Journal of Combinatorial Theory Series A**, 199, No.105769, 28 pages (2023).

3. Shengwen Gan, Yifan Jing, and Shukun Wu, "New bounds for Stein's square function in $\mathbb{R}^3$", *to appear in* **Contemporary Mathematics American Mathematical Society** (book series), arXiv:2104.14731, 54 pages (2023).

4. <u>Yifan Jing</u>, Souktik Roy, and Chieu-Minh Tran, "Semialgebraic methods and generalized sum-product phenomena", **Discrete Analysis**, 2022:18, 23 pages (2022).

5. <u>Yifan Jing</u> and Shukun Wu, "The largest (k, ℓ)-sum-free subsets", **Transactions of the American Mathematical Society**, 374(7) 5163–5189 (2021).

6. <u>Yifan Jing</u>, Alexandr Kostochka, Fuhong Ma, and Jingwei Xu, "Defective DP-colorings of sparse simple graphs", **Discrete Mathematics**, 345(1), No.112637, 14 pages (2022).

7. <u>Yifan Jing</u>, Alexandr Kostochka, Fuhong Ma, Pongpat Sittitrai, and Jingwei Xu, "Defective DP-colorings of sparse multigraphs", **European Journal of Combinatorics**, 93 244–263 (2021).

8. Gennian Ge, <u>Yifan Jing</u>, Zixiang Xu, and Tao Zhang, "Color isomorphic even cycles and a related Ramsey problem", **SIAM Journal on Discrete Mathematics**, 34(3) 1999–2008 (2020).

9. József Balogh, Béla Csaba, <u>Yifan Jing</u>, and András Pluhár, "On the discrepancies of graphs", **Electronic Journal of Combinatorics**, 27(2) #P2.12, 15 pages (2020).

10. Gennian Ge, <u>Yifan Jing</u>, and Zixiang Xu, "On vertex-induced weighted Turán problems", **Discrete Mathematics**, 345(1), No.112628, 8 pages (2022).

11. <u>Yifan Jing</u> and Bojan Mohar, "Efficient polynomial-time approximation scheme for the genus of dense graphs", *2018 IEEE 59th Annual Symposium on Foundations of Computer Science*—**FOCS**'18, 719–730, IEEE Computer Soc., Paris, France (2018).

12. <u>Yifan Jing</u> and Bojan Mohar, "The genus of complete 3-uniform hypergraphs", **Journal of Combinatorial Theory Series B**, 141 223–239, (2020).

13. <u>Yifan Jing</u> and Bojan Mohar, "The genus of a random bipartite graph", **Canadian Journal of Mathematics**, 72(6) 1607–1623 (2020).

14. <u>Yifan Jing</u>, Jack Koolen, and Zhi Qiao, "Non-bipartite distance-regular graphs with a small smallest eigenvalue", **Electronic Journal of Combinatorics**, 26(2) #P2.41, 10 pages (2019).

SUBMITTED PAPERS & PREPRINTS

1. <u>Yifan Jing</u> and Akshat Mudgal, "Kemperman's inequality and Freiman's lemma via few translates", *submitted*, arXiv:2307.03066, 18 pages (2023).

2. <u>Yifan Jing</u>, Chieu-Minh Tran, and Ruixiang Zhang, "Measure doubling of small sets in $\mathrm{SO}(3, \mathbb{R})$", *submitted*, arXiv:2304.09619, 40 pages (2023).

3. <u>Yifan Jing</u> and Akshat Mudgal, "Finding large additive and multiplicative sidon sets in sets of integers", *submitted*, arXiv:2203.13174, 22 pages (2022).

4. Jinpeng An, <u>Yifan Jing</u>, Chieu-Minh Tran, and Ruixiang Zhang, "On the small measure expansion phenomenon in connected noncompact nonabelian groups", *submitted*, arXiv:2111.05236, 25 pages (2021).

5. <u>Yifan Jing</u> and Chieu-Minh Tran, "A Cauchy–Davenport theorem for locally compact groups", *submitted*, arXiv:2106.02924v2, 12 pages (2021).

6. <u>Yifan Jing</u> and Shukun Wu, "A note on the largest sum-free sets of integers", *submitted*, arXiv:2011.09963, 17 pages (2023).

7. <u>Yifan Jing</u> and Chieu-Minh Tran, "Measure growth in compact semisimple Lie groups and the Kemperman Inverse Problem", *submitted*, arXiv:2303.15628, 50 pages (2022).

8. <u>Yifan Jing</u> and Chieu-Minh Tran, "Minimal and nearly minimal measure expansions in connected unimodular groups", *preprint*, arXiv:2006.01824v3, 84 pages (2020).

9. <u>Yifan Jing</u> and Bojan Mohar, "Efficient polynomial-time approximation scheme for the genus of dense graphs", *submitted*, arXiv:2011.08049, 36 pages (2020).

10. <u>Yifan Jing</u> and Bojan Mohar, "The genus of generalized sparse random graphs", *preprint*, 17 pages (2019).

11. Sebastián González, <u>Yifan Jing</u>, and Masood Masjoody, "On the structure of (claw, bull)-free graphs", *preprint*, arXiv:1901.00043, 17 pages (2019).

12. <u>Yifan Jing</u> and Akbar Rafiey, "Counting maximal near perfect matchings in quasirandom and dense graphs", *preprint*, arXiv:1807.04803, 15 pages (2019).

AWARDS AND RESEARCH FELLOWSHIPS

- Wolfson College Junior Research Fellow Academic Award   Spring 2023

- LMS Undergraduate Research Bursaries for supervising the Summer Research Program   2022

- Gold Medal of Doctor thesis for New World Mathematics Awards (declined due to COVID)   2022

- Chinese Government Award for Outstanding Self-Financed Students Abroad   2022

- University Fellowship and Trijitzinsky Fellowship, UIUC   Spring 2021

- Research Assistantship by Arnold O. Beckman Research Award, UIUC   2020–2021

- Summer Supplement Fellowship, UIUC   Summer 2020

- Wind Information Scholarship, UIUC   Summer 2020

- Golub Research Assistantship, UIUC   Summer 2019

- Graduate Fellowship, SFU   Summer 2018

- SIAM Student Travel Awards   Summer 2018

- Travel and Minor Research Award, SFU   Spring 2018

- Professional Development Grants, SFU   Spring 2018

- Travel and Minor Research Award, SFU   Summer 2017

- Special Graduate Entrance Scholarship, SFU   Fall 2016

UNDERGRADUATE STUDENTS SUPERVISED

- Albert Lopez Bruch (Oxford, cosupervised with Akshat Mudgal, Summer 2022)
  Project: Sumset estimates of multiple linear transforms in $\mathbb{Z}^d$

- Ahmed Ittihad Hasib (Oxford, cosupervised with Akshat Mudgal, Summer 2022)
  Project: Quantitative aspects of the Elekes–Ronyai theorem

- Maria Matthis (Oxford, cosupervised with Akshat Mudgal, Summer 2022)
  Project: An inverse theorem of sum of dilates in $\mathbb{R}^d$

- Anubhab Ghosal (Oxford, cosupervised with Akshat Mudgal, Summer 2023)

TEACHING EXPERIENCE

- Spring (Trinity) 2023: Lecturer for Approximate Groups (16 hrs) at Univerity of Oxford.

- Summer 2022: Lecturer for Additive Combinatorics (16 hrs) at Nankai University.

- Winter 2020: Lecturer for Additive Combinatorics (10 hrs) at Shandong University.

- Fall 2020: Tutor for Math 221 (Calculus I) Section CDK, Section ADH, and Section ADW at UIUC.

- Spring 2020: Grader for Math 213 (Discrete Math), Math 482 (Linear Programming), and Math 484 (Nonlinear Programming) at UIUC.

- Fall 2019: Grader for Math 482 (Linear Programming) and Math 484 (Nonlinear Programming) at UIUC.

- Spring 2019: Tutor for Math 285 (Ordinary Differential Equation), Grader for Math 482 (Linear Programming), and Math 484 (Nonlinear Programming) at UIUC.

- Fall 2018: Grader for Math 412 (Graph Theory) and Math 482 (Linear Programming) at UIUC.

- Spring 2018: Tutor for Calculus I, Calculus II, and Calculus III at SFU.

- Fall 2017: Tutor for Calculus I, Calculus II, and Calculus III at SFU.

- Spring 2017: Tutor for Calculus I, Calculus II, and Calculus III at SFU.

- Fall 2016: Tutor for Calculus I, Calculus II, and Calculus III at SFU.

TALKS

1. Geometric Group Theory Seminar, University of Oxford — October 2023
2. Special Year Research Seminar, Institute for Advanced Study, Princeton — May 2023
3. Combinatorics Seminar, University of Bristol — May 2023
4. Logic Seminar, University of Münster — April 2023
5. Linfoot Number Theory Seminar, University of Bristol — March 2023
6. Special Colloquium, Ohio State University — January 2023
7. (Online) Special Colloquium, National University of Singapore — January 2023
8. Special Colloquium, Emory University — January 2023
9. (Online) Number Theory Seminar, Xi'an Jiaotong University — December 2022
10. (Online) Discrete Mathematics Seminar, Karlsruher Institut für Technologie — December 2022
11. Combinatorics and Graph Theory Seminar, University of Illinois — November 2022
12. Special Year Research Seminar, Institute for Advanced Study, Princeton — November 2022
13. Combinatorics Reading Seminar, Stanford University — November 2022
14. Discrete Analysis Seminar, California Institute of Technology — November 2022
15. (Online) Combinatorics Seminar, Nankai University — September 2022
16. Combinatorics Seminar, National University of Singapore — August 2022

17. (Online) 1st Red Orchard Forum on Frontier of Mathematics, Beijing Jiaotong University   July 2022

18. Combinatorics meets Model Theory, University of Cambridge   June 2022

19. (Online) Discrete Analysis Seminar, California Institute of Technology   May 2022

20. (Online) Lecture series in Loo-Keng Hua Young Mathematician Forum, Academy of Mathematics and Systems Science, Chinese Academy of Sciences   March 2022

21. (Online) Junior Number Theory Seminar, University of Oxford   January 2022

22. (Online) Combinatorics Seminar, Nankai University   November 2021

23. Combinatorial Theory Seminar, University of Oxford   November 2021

24. (Online) Number Theory Seminar, Shandong University   November 2021

25. Combinatorics Literature Seminar, University of Illinois   September 2021

26. (Online) Discrete Math Seminar, Simon Fraser University   July 2021

27. (Online) Combinatorial and Additive Number Theory, The City University of New York   May 2021

28. (Online) Canadian Discrete and Algorithmic Mathematics Conference' 21   May 2021

29. (Online) 1st Combinatorial Meeting of Prairie and Sky, University of Illinois   May 2021

30. (Online) Discrete Math Seminar, Arizona State University   March 2021

31. (Online) Winter course, Shandong University   January 2021

32. (Online) Graph Theory and Combinatorics Seminar, University of Illinois   December 2020

33. (Online) Graph Theory Seminar, Georgia Institute of Technology   October 2020

34. (Online) Webinar in Additive Combinatorics, University of Oxford   October 2020

35. (Online) AMS Sectional Meeting, special session on structural and extremal graph theory, University of Tennessee Chattanooga   October 2020

36. (Online) SCMS Combinatorics Seminar, Shanghai Center for Mathematical Sciences   July 2020

37. (Online) Mathematics Seminar, Nankai University   July 2020

38. (Online) Combinatorics Seminar, University of Warwick   June 2020

39. Graph Theory and Combinatorics Seminar, University of Illinois   March 2020

40. Discrete Mathematics Seminar, Illinois State University   February 2020

41. Notre Dame Mathematical Logic Seminar, University of Notre Dame   February 2020

42. Combinatorics Literature Seminar, University of Illinois   January 2020

43. Probability Seminar, University of Illinois   October 2019

44. Student Conference in Erdős Lecture Series, University of Memphis   September 2019

45. Summer School in Combinatorics and Discrete Geometry, Capital Normal University   July 2019

46. Combinatorics and Graph Theory Seminar, Shandong University   July 2019

47. Discrete Mathematics Seminar, Shanghai Center for Mathematical Sciences   July 2019

48. Graduate Student Mathematics Seminar, Simon Fraser University   June 2019

49. Canadian Discrete and Algorithmic Mathematics Conference' 19, Simon Fraser University   May 2019

50. 31st Cumberland Conference on Combinatorics, Graph Theory and Computing,
    University of Central Florida   May 2019

51. 15th Graduate Student Combinatorics Conference, University of Pennsylvania   April 2019

52. Graph Theory and Combinatorics Seminar, University of Illinois   September 2018

53. 4th Mostly Manitoba, Michigan and Minnesota Combinatorics Graduate Students
    Workshop, Iowa State University   September 2018

54. Mathematics Seminar on Combinatorics and Graph Theory, Anhui University   July 2018

55. Center for Combinatorics, Nankai University   July 2018

56. Discrete Math Seminar, Simon Fraser University   July 2018

57. SIAM Conference on Discrete Mathematics' 18, University of Colorado   June 2018

58. Yau Mathematical Sciences Center Applied Math Seminar, Tsinghua University   December 2017

59. Wu Wen-Tsun Laboratory of Mathematics Seminar on Combinatorics,
    University of Science and Technology of China   December 2017

60. 6th USTC-AHU Joint Seminar on Algebraic Combinatorics, Anhui University   June 2016

SERVICE

- Referee Service: *Algebraic & Number Theory*; *Discrete Analysis*; *Discrete Mathematics*; *European Journal of Combinatorics*; *Internet Mathematics*; *Mathematical Proceedings of the Cambridge Philosophical Society*; *Random Structures & Algorithms*; *Science China Mathematics*; *SIAM Journal on Discrete Mathematics*; *The Australasian Journal of Combinatorics*; *The Electronic Journal of Combinatorics*

- Reviewer: *Mathematical Reviews (MathSciNet)*

- Co-organizer (with Chieu-Minh Tran): Arithmetic Combinatorics Symposiums at CanaDAM' 21.

- Co-organizer (with Felix Clemen): Combinatorics Literature Seminar at UIUC, 2019–2020

PARTICIPATION IN MATHEMATICAL CONTESTS

- Chinese Mathematical Olympiad (CMO)   2012

- National High School Mathematical Contest, first prize   2011

- Shiing-Shen Chern Senior High School Mathematical Olympiad, first prize   2010, 2011