Zilin Jiang

CONTACT INFORMATION

School of Mathematical and Statistical Sciences
School of Computing and Augmented Intelligence
Arizona State University
Tempe, AZ 85281

Phone: (412) 961-2414
Email: zilinj@asu.edu
Web: zilin.one

RESEARCH INTERESTS

Discrete geometry, graph theory, combinatorics, information theory.

EDUCATION AND EMPLOYMENT

Arizona State University, Tempe **Jan 2021 – present**

Assistant Professor, School of Mathematical and Statistical Sciences, and School of Computing and Augmented Intelligence

Massachusetts Institute of Technology, Boston **Sep 2018 – Dec 2020**

Applied Mathematics Instructor, Department of Mathematics

Mentor: Professor Yufei Zhao

Technion – Israel Institute of Technology, Haifa **Aug 2016 – Jul 2018**

Postdoctoral Researcher, Department of Mathematics

Host: Professor Ron Aharoni

Carnegie Mellon University, Pittsburgh **Sep 2011 – May 2016**

Ph.D., Department of Mathematical Sciences

Advisor: Professor Boris Bukh

Peking University, Beijing **Sep 2007 – Jun 2011**

B.Sc., School of Mathematical Sciences

MENTEES

Hricha Acharya (PhD candidate, 2022–present)
Theodore Gossett (PhD candidate, 2023–present)
Ethan Leventhal (Undergraduate, 2023–2024)
Xiaofan Yuan (Postdoc, 2022–present)
Zoe Wellner (Postdoc, 2024–present)

AWARDS

The AMS–Simons travel grants, 2019 – 2021.
The NSF Grant DMS-1953946, Jun 2020 – May 2024.
ICCM Kevin Bao Best Paper Award, January 2024.
Delbert Ray Fulkerson Prize, July 2024.
International Congress of Basic Science Frontiers of Science Award, July 2025.

PUBLICATION

Zilin Jiang. A slight improvement to the colored Bárány's theorem. *Electronic Journal of Combinatorics*, 21(4):P4.39, 2014.

Boris Bukh and Zilin Jiang. A bound on the number of edges in graphs without an even cycle. *Combinatorics, Probability and Computing*, 26(1):1–15, 2017.

Zilin Jiang and Alexandr Polyanskii. Proof of László Fejes Tóth's zone conjecture. *Geometric and Functional Analysis*, 27(6):1367–1377, 2017.

Ron Aharoni, Yair Censor and Zilin Jiang. Finding a best approximation pair of points for two polyhedra. *Computational Optimization and Application*, 71(2):509–523, 2018.

Boris Bukh and Zilin Jiang. Bipartite algebraic graphs without quadrilaterals. *Discrete Mathematics*, 341(6):1597–1604, 2018.

Ron Aharoni, Noga Alon, Michal Amir, Penny Haxell, Dan Hefetz, Zilin Jiang, Gal Kronenberg and Alon Naor. Ramsey-nice families of graphs. *European Journal of Combinatorics*, 72:29–44, 2018.

Zilin Jiang and Nikita Polyanskii. How to guess an n-digit number. *Proceedings of the Thirtieth Annual ACM-SIAM Symposium on Discrete Algorithms*, 1215–1220, 2019.

Zilin Jiang. On spectral radii of unraveled balls. *Journal of Combinatorial Theory, Series B*, 136:72–80, 2019.

Zilin Jiang, Nikita Polyanskii and Ilya Vorobyev. On capacities of the two-user union channel with complete feedback. *IEEE Transactions on Information Theory*, 65(5):2774–2781, 2019.

Zilin Jiang and Nikita Polyanskii. On the metric dimension of Cartesian powers of a graph. *Journal of Combinatorial Theory, Series A*, 165:1–14, 2019.

Ron Aharoni, Ron Holzman and Zilin Jiang. Rainbow fractional matchings. *Combinatorica*, 39(6):1191–1202, 2019.

Ron Aharoni, Eli Berger, Maria Chudnovsky, Frédéric Havet and Zilin Jiang. Cooperative colorings of trees and of bipartite graphs. *The Electronic Journal of Combinatorics*, 27(1):P1.41, 2020.

Zilin Jiang and Alexandr Polyanskii. Forbidden subgraphs for graphs of bounded spectral radius, with applications to equiangular lines. *Israel Journal of Mathematics*, 236:393–421, 2020.

Ron Aharoni, Joseph Briggs, Ron Holzman and Zilin Jiang. Rainbow odd cycles. *SIAM Journal on Discrete Mathematics*, 35(4), 2293–2303, 2021.

Zilin Jiang, Jonathan Tidor, Yuan Yao, Shengtong Zhang and Yufei Zhao. Equiangular lines with a fixed angle. *Annals of Mathematics*, 194(3):729–743, 2021.

Zilin Jiang and Amir Yehudayoff. An isoperimetric inequality for Hamming balls and local expansion in hypercubes. *The Electronic Journal of Combinatorics*, 29(1):P1.15, 2022.

Samuel H. Florin, Matthew H. Ho and Zilin Jiang. On the binary adder channel with complete feedback, with an application to quantitative group testing. *IEEE Transactions on Information Theory*, 68(5):2839–2856, 2022.

Tao Jiang, Zilin Jiang and Jie Ma. Negligible obstructions and Turán exponents. *Annals of Applied Mathematics*, 38(3):356–384, 2022.

Zilin Jiang, Jonathan Tidor, Yuan Yao, Shengtong Zhang and Yufei Zhao. Spherical two-distance sets and eigenvalues of signed graphs. *Combinatorica*, 43(2):203–232, 2023.

Zilin Jiang. On symmetric hollow integer matrices with eigenvalues bounded from below. *Linear Algebra and its Applications*, 709, 233–240, 2025.

PREPRINT

Zilin Jiang and Alexandr Polyanskii. Forbidden induced subgraphs for graphs and signed graphs with eigenvalues bounded from below. Preprint `arXiv:2111.10366[math.CO]`, November 2021.

Hricha Acharya and Zilin Jiang. Beyond the classification theorem of Cameron, Goethals, Seidel, and Shult. Preprint `arXiv:2404.13136[math.CO]`, April 2024.

Zilin Jiang and Zhiyu Wang. On the smallest eigenvalues of 3-colorable graphs Preprint arXiv:2505.03014[math.CO], May 2025.

Professional Services

Advisor of Mathematics Tomorrow Seminar (an ASU student club). August 2022 – present.

Co-organizer of ASU Discrete Math Seminar. Jan 2021 – present.

Co-organizer of Research Innovation in Mathematical Sciences Seminar. August 2021 – present.

Co-organizer of MIT–Havard–MSR Combinatorics Seminar. Sep 2018 – Mar 2020.

Advisor of MIT undergraduates majoring in mathematics. Sep 2019 – Jun 2020.

Referee of

- Acta Applicandae Mathematicae
- Advances in Applied Mathematics
- Advances in Combinatorics
- Annals of Combinatorics
- Ars Mathematica Contemporanea
- Bulletin of the Brazilian Mathematical Society
- Combinatorial Theory
- Combinatorica
- Combinatorics, Probability and Computing
- Computational Optimization and Applications
- Discrete Applied Mathematics
- Electronic Journal of Combinatorics
- European Journal of Combinatorics
- Forum of Mathematics, Sigma
- Discrete & Computational Geometry
- Discrete Mathematics
- Graphs and Combinatorics
- IEEE Transactions on Information Theory
- International Mathematics Research Notices
- Israel Journal of Mathematics
- Journal of Combinatorial Theory Series A
- Journal of Combinatorial Theory Series B
- Journal of Combinatorics
- Journal of Graph Theory

- Linear Algebra and Its Applications
- Mathematics of Computation
- Proceedings of the American Mathematical Society
- Science China Mathematics
- SIAM Journal on Discrete Mathematics
- SIAM Review

Reviewer of Mathematical Reviews, Apr 2018 – present.

Invited talks

June 23, 2025. The 26th Conference of the International Linear Algebra Society. National Sun Yat-sen University. "Median eigenvalues of subcubic graphs"

June 10, 2025. Frontiers in Combinatorics and Theoretical Computer Science (Workshop). The Institute for Advanced Study in Mathematics in Hangzhou. "Median eigenvalues of subcubic graphs"

April 12, 2025. Southwestern Undergraduate Mathematics Research Conference. Arizona State University. "Extremal problems in discrete geometry"

January 11, 2025. Joint Mathematics Meetings. Seattle Convention Center. "Beyond the classification theorem of Cameron, Goethals, Seidel and Shult"

October 27, 2024. AMS Fall Western Sectional Meeting, University of California, Riverside, "Beyond the classification theorem of Cameron, Goethals, Seidel and Shult"

October 26, 2024. AMS Fall Western Sectional Meeting, University of California, Riverside, "Rainbow odd cycles"

June 21, 2024. Workshop on Topological Combinatorics, L'Institut de Recherche en Informatique Fondamentale, "Rainbow odd cycles"

April 13th, 2024. Shanks Workshop on Combinatorics & Graph Theory, Vanderbilt University, "Beyond the classification theorem of Cameron, Goethals, Seidel and Shult"

August 21, 2023. Soochow University Summer School on Combinatorics, Virtual (Zoom), "Forbidden subgraphs and spherical two-distance sets"

July 13th, 2023. Workshop on Graph Theory and Combinatorics, Luoyang, Henan, China, "Extremal Problems in Discrete Geometry"

June 8, 2023. Canadian Discrete and Algorithmic Mathematics, University of Winnipeg, "Rainbow odd cycles"

March 18, 2023. AMS Spring Southeastern Sectional Meeting, Georgia Institute of Technology, "Rainbow odd cycles"

October 23, 2022. AMS Fall Western Sectional Meeting, University of Utah, "Forbidden subgraphs and spherical two-distance sets"

October 16, 2022. AMS Fall Southeastern Sectional Meeting, University of Tennessee at Chattanooga, "Eigenvalues, forbidden subgraphs, and Ramsey"

June 15, 2022. SIAM Conference on Discrete Mathematics, Carnegie Mellon University, "Eigenvalues, forbidden subgraphs, and Ramsey"

January 24, 2022. Workshop on Algebraic Combinatorics, Virtual (Webex), "Forbidden subgraphs and spherical two-distance sets"

July 27, 2021. Hua Loo-Keng Young Mathematicians Forum, Virtual (VooV), "Forbidden subgraphs and spherical two-distance sets"

July 26, 2021. Hua Loo-Keng Young Mathematicians Forum, Virtual (VooV), "Eigenvalue multiplicity and equiangular lines"

July 23, 2021. Hua Loo-Keng Young Mathematicians Forum, Virtual (VooV), "Extremal Problems in Discrete Geometry"

July 20th, 2021. SIAM Conference on Discrete Mathematics, Virtual (Zoom), "Spherical two-distance sets and spectral theory of signed graphs"

July 2, 2021. Moscow Conference on Combinatorics and Applications, Virtual (Zoom), "Forbidden subgraphs and spherical two-distance sets"

October 10th, 2020. Special Session on Structural and Extremal Graph Theory, Fall Southeastern Sectional Meeting (Zoom), "Negligible obstructions and Turán exponents"

July 22, 2019. Topological Methods in Combinatorics, Charles University, "Colored Bárány's theorem"

June 12th, 2019. The 8th International Congress of Chinese Mathematicians, Tsinghua University, "Rainbow structures via algebraic topology"

August 13th, 2018. Combinatorics Workshop, Capital Normal University, "Forbidden subgraphs and equiangular lines"

August 11th, 2018. Combinatorics Workshop, Capital Normal University, "Spherical Tarski's plank problem"

June 5, 2018. SIAM Conference on Discrete Mathematics, University of Colorado Denver, "Forbidden subgraphs and equiangular lines"

March 20th, 2018. ERC Workshop: Geometric Transversal and Epsilon-Nets, Ein Gedi, "Spherical Tarski's plank problem"

May 28, 2017. Israel Mathematical Union 2017 Annual Meeting, Rimonim Palm Beach, Akko, "On spherical Tarski's plank problem"

August 23, 2016. Hungarian–Israeli Combinatorial Days, Technion – Israel Institute of Technology, "Bipartite algebraic graphs without quadrilaterals"

July 30th, 2015. Random Structures and Algorithms, Carnegie Mellon University, "Topological method for the colored Bárány's theorem"

June 18, 2015. Connections in Discrete Mathematics, Simon Fraser University, "A bound on Turán number for cycles of even length"

Seminar talks

November 15, 2025. Research Innovation in the Mathematical Sciences Seminar, Arizona State University, "Exploring Lean 4"

November 1, 2025 Combinatorics Seminar, Duke University, "Beyond the classification theorem of Cameron, Goethals, Seidel and Shult"

October 11, 2024. Combinatorics Seminar, Louisiana State University, "Beyond the classification theorem of Cameron, Goethals, Seidel and Shult"

September 16, 2024. CAM/DoMSS Seminar, Arizona State University, "Extremal problems in discrete geometry"

September 28, 2023. Tsinghua Open Problems Seminar, Virtual (VooV), "Open problems in discrete geometry"

July 22, 2023. Hebei Normal University Seminar, Virtual (Zoom), "Forbidden subgraphs and spherical two-distance sets"

July 21, 2018. Hebei Normal University Seminar, Virtual (Zoom), "Spherical Tarski's plank problem"

March 23, 2023. Auburn University DMS Combinatorics Seminar, Virtual (Zoom), "Forbidden subgraphs and spherical two-distance sets"

February 16, 2023. Illinois State University Discrete Mathematics Seminar, Virtual (Zoom), "Forbidden subgraphs and spherical two-distance sets"

November 2, 2022. National University of Singapore Combinatorics and Graph Theory Seminar, Virtual (Zoom), "Forbidden subgraphs and spherical two-distance sets"

July 7, 2022. Copenhagen-Jerusalem Combinatorics Seminar, Virtual (Zoom), "Rainbow structures via topological methods"

June 21, 2022. Codes and Expansions Seminar, Virtual (Zoom), "Forbidden subgraphs and spherical two-distance sets"

April 13th, 2022. Bridge to Research Seminar, Arizona State University, "Extremal Problems in Discrete Geometry"

April 1, 2022. Discrete Math Seminar, Emory University, "Forbidden subgraphs and spherical two-distance sets"

March 23, 2021. Codes and Expansions Seminar, Virtual (Zoom), "Spherical two-distance sets and spectral theory of signed graphs"

August 13th, 2020. SCMS Combinatorics Seminar, Shanghai Center for Mathematical Sciences (Zoom), "Negligible obstructions and Turán exponents"

July 9, 2020. Seminar on topological combinatorics, Combinatorial Structures and Processes (Zoom), "Rainbow odd cycles"

July 3, 2020. Seminar on Combinatorics, National Taiwan University (Webex), "Spherical two-distance sets and spectral theory of signed graphs"

March 10th, 2020. Combinatorics Seminar, Brandeis University, "The colorful world of rainbow sets"

January 30th, 2020. Discrete Mathematics Seminar, University of Massachusetts Amherst, "Equiangular lines with a fixed angle"

December 18, 2019. Combinatorics Seminar, Technion – Israel Institute of Technology, "Equiangular lines with a fixed angle"

November 18, 2019. Discrete Mathematics Seminar, Iowa State University, "Equiangular lines with a fixed angle"

October 15, 2019. Graph Theory and Combinatorics Seminar, University of Illinois at Urbana-Champaign, "Equiangular lines with a fixed angle"

October 14, 2019. Combinatorics and Probability Seminar, University of Illinois at Chicago, "Equiangular lines with a fixed angle"

July 5, 2019. Combinatorics Seminar, Shanghai Jiaotong University, "Spectral radius: local and global"

June 22, 2019. The 18th AHU–USTC Joint Seminar, Anhui University, "Forbidden subgraphs and equiangular lines"

June 19, 2019. Combinatorics and Graph Theory Seminar, University of Science and Technology of China, "Cooperative colorings"

June 5, 2019. Discrete Mathematics Seminar, Shanghai Center for Mathematical Sciences, "Rainbow structures via algebraic topology"

October 19, 2018. Combinatorics Seminar, Emory University, "Rainbow fractional matchings"

September 5, 2018. Combinatorics Seminar, Massachusetts Institute of Technology, "Spherical Tarski's plank problem"

May 23, 2018. Computer Science Seminar, Ariel University, "Forbidden subgraphs and equiangular lines"

May 17, 2018. ACO Seminar, Carnegie Mellon University, "Rainbow fractional matchings"

April 25, 2018. Combinatorics Seminar, Ben Gurion University, "How to guess an n-digit number"

April 24, 2018. Research Seminar in Combinatorics, Tel Aviv University, "How to guess an n-digit number"

March 16, 2018. School Colloquim, Peking University, "Spherical Tarski's plank problem"

March 14, 2018. An Hour of Maths, Peking University, "Five miniatures of linear algebra"

January 21, 2018. Nonlinear Analysis and Optimization Seminar, Technion – Israel Institute of Technology, "On spherical Tarski's plank problem"

December 12th, 2017. Applied Mathematics Seminar, ORT Braude College, "Finding the closest pair of points on two polyhedra"

August 20th, 2017. Nonlinear Analysis and Optimization Seminar, Technion – Israel Institute of Technology, "Finding the closest pair of points on two polyhedra"

April 5, 2017. Combinatorics Gathering, Technion – Israel Institute of Technology, "On spherical Tarski's plank problem"

March 6, 2017. Combinatorics Seminar, Hebrew University of Jerusalem, "Relations between Tverberg points and central points"

April 19, 2016. Gradaute Student Seminar, Carnegie Mellon University, "Races beyond Riemann hypothesis"

March 1, 2016. Graduate Student Seminar, Carnegie Mellon University, "Random algebraic method and its application"

November 17, 2015. Graduate Student Seminar, Carnegie Mellon University, "Classification of bipartite algebraic graphs without quadrilaterals"

October 13th, 2015. Graduate Student Seminar, Carnegie Mellon University, "Why elliptic curves are called elliptic?"

April 9, 2015. Graduate Student Seminar, Carnegie Mellon University, "Hardy–Littlewood circle method and Waring's problem"

February 19, 2015. Graduate Student Seminar, Carnegie Mellon University, "The best card trick"

January 15, 2015. Graduate Student Seminar, Carnegie Mellon University, "An expedition to the world of p-adic numbers"

November 4, 2014. Graduate Student Seminar, Carnegie Mellon University, "Introduction to Diophantine approximation"

September 23, 2014. Graduate Student Seminar, Carnegie Mellon University, "A taste of topological methods in combinatorics"

November 8, 2012. Math Club, Carnegie Mellon University, "Computability and busy beaver"

October 29, 2012. Model Theory Seminar, Carnegie Mellon University, "Many models for unstable first-order theory (4 talks)"

Experience

Mentor of PRIMES-USA **Jan 2019 – Dec 2020**

Program for Research in Mathematics, Engineering and Science for High School Students. The students work on original research projects in mathematics.

Instructor of Yau Tsinghua Mathcamp **Aug 2018, 2019**

The participants are top high schoolers from across China. The courses are designed to bridge mathematics competitions and research-level mathematics.

Instructor of Mathematical Olympiad Summer Program **Jun 2014 – 2016**

The participants include the six members of the USA team for the International Mathematical Olympiad (IMO). Team USA led by Po-Shen Loh took the 2nd place at IMO 2014. The team claimed the championship title in 2015, the first time since 1994, and defended its title in 2016.

Instructor of Chinese Mathematical Society **Jun 2017**

I gave lecture series on topological combinatorics at the High School Affiliated to Fudan University. The audience include the six members of the China IMO team. Team China lead by Yijun Yao took the 2nd place at IMO 2017.

Instructor of International Mathematics Summer Camp **Jun 2023**

Twenty-seven teams from 23 countries and regions participated in the summer camp, including Canada, Brazil, South Africa, Armenia, Azerbaijan and Iran.