Zeyu Zheng

My Homepage

zeyuzheng19@fudan.edu.cn or zeyu.zheng@rutgers.edu

EDUCATION

Rutgers University — New Brunswick, New Jersey, USA
Undergraduate study in Math and Computer Science — *May 2022 - present*

Budapest Semesters in Mathematics — Budapest, Hungary, EU
with Highest Honors — *Jan 2022 - Aug 2022*

Fudan University — Shanghai, Mainland China
Buqing Su Top-notch Talent Program in Mathematics — *Sep 2019 - present*

Alfréd Rényi Institute of Mathematics — Budapest, Hungary, EU
Semester on Large Networks and their Limits — *May 2022 - Jun 2022*

University of Illinois at Urbana-Champaign — Urbana, Illinois, USA
Summer School on Flag Algebras, online — *Jun 2021 - Jul 2021*

Major courses:
Combinatorial Optimization (A-), Graph Theory (A), Advanced Combinatorics (A), Introduction to Number Theory (A+), Calculus (A), Complex Analysis (A-), Real Analysis (A-), Fourier Analysis (A+), Linear Algebra (A), Abstract Algebra (B+), Galois Theory (A+), Analytic Geometry (A), Discrete and Convex Geometry (A+), Topology (A), Algebraic Topology (B+), Mathematical Modeling (A), Mathematical Modeling and Practice (A), Theory of Computing (A+), Conjecture and Proof (A+), Research Opportunities (A+)

RESEARCH WORKS

1. Chaoliang Tang, Hehui Wu, Shengtong Zhang, and Zeyu Zheng, "Note on the Turán number of the linear 3−graph C_{13}", *accepted* by **Electronic Journal of Combinatorics**, arXiv:2109.10520v3.
2. Logan Post and Zeyu Zheng, "Common kings of a chain of cycles in a strong tournament", *under review*, arXiv:2206.04154.
3. Tibor Jordán, Henry Simmons, Kaylee Weatherspoon and Zeyu Zheng, "Regular graphs with extremal rigidity properties", *manuscript*.
4. Ervin Győri, Xianzhi Wang and Zeyu Zheng, "Triangular and quadrangular contribution methods in planar Turán numbers", *manuscript*.

RESEARCH EXPERIENCE

Turán Number of Linear 3-Graphs — Dec 2020 - Oct 2021
Advisor: Hehui Wu — *Shanghai Center for Mathematical Sciences, Fudan University*
• We introduced a new approach to this kind of problems. By this new method, we proved and strengthened a conjecture of András Gyárfás about the Turán number of a linear 3-graph. (arXiv:2109.10520v3)

Shannon Capacity of Graphs — Oct 2021 - present
Advisor: Hehui Wu — *Shanghai Center for Mathematical Sciences, Fudan University*
• We work on the Shannon Capacity of odd cycles. Our approach is to find a bound of the independence number of the strong product of k $(2n+1)$-cycles.

Planar Turán Number — Jan 2022 - present
Advisor: Ervin Győri — *Alfréd Rényi Institute of Mathematics & Budapest Semesters in Mathematics*
• We have found a new approach to find the planar Turán number of C_5, i.e. to partition the graph into triangular blocks and do local calculations. We've also found a better extremal construction.
• We have found tight bounds for the maximum number of edges in a C_6/C_8-free planar bipartite/triangle-free planar graph with some restrictions of small degree vertices.

Rigidity Properties of Graphs — Jan 2022 - present
Advisor: Tibor Jordán — *Eötvös Loránd University & Budapest Semesters in Mathematics*
• We have fully characterized the the minimal 2-vertex globally rigid graphs. We proved some properties of 2-vertex globally rigid graphs and established some equivalences of 2-edge globally rigid graphs under different conditions.
• We are trying to establish some more connections between the framework rigidity and the property of the underlying graph.

Forbidden Configurations — May 2022 - present
Advisor: Attila Sali — *Alfréd Rényi Institute of Mathematics & Budapest Semesters in Mathematics*
• We are working on the induced version of the Turán-type problem of uniform hypergraphs.

TEACHING EXPERIENCE

- Fall 2021: TA for Linear Algebra at FDU

HONORS AND AWARDS

- Hungarian BME Mathematical Contest for university students, second place 2022
- Scholarship for Outstanding Students, FDU 2020-2021 & 2019-2020
- Eastern China Cup Mathematical Contest in Modeling, outstanding winner 2021
- The Chinese Mathematics Competition for college students, first prize 2020
- National High School Mathematical Contest, first prize 2018

TALKS

1. 11th Cross-strait Conference on Graph Theory and Combinatorics Aug 2021