Yitong HE

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EDUCATION BACKGROUND

Xi'an Jiaotong University, Honors Science Program (Mathematics) **Xi'an, China**
B.Sc. in Mathematics and Applied Mathematics *Sep. 2022 – July. 2026 (expected)*
GPA: 3.99/4.30 | 92.58/100

- **Research Interests:** Combinatorics, Graph Theory, Number Theory
- **Programming:** Python, LaTeX
- **Relevant Coursework:** Elementary Number Theory, Combinatorics, Modern Algebra, Topology, Functions of real variable, Probability, Theory of one complex variable, Differential Geometry, Functional Analysis, Analytic Number Theory
- **Honors:** Model Student of Academic Records, 2024; The Second Prize Scholarship of XJTU, 2024

University of California, Berkeley **Berkeley, CA**
Berkeley Global Access Visiting Student Programs *Jan. 2025-June. 2025*
GPA: 3.57/4.0

Honors Youth Program (Special Class for the Gifted Young), Xi'an Jiaotong University **Xi'an, China**
Preparatory Program *Sep. 2020 – July. 2022*
GPA: 91.48/100, Rank: 3/171

PUBLICATIONS

[1] Chen, L., **He, Y. T.**, & Wang, D. G. (2026). Clocks are e-positive. *Discrete Mathematics*, 349(1), 114723. https://doi.org/10.1016/j.disc.2025.114723.

[2] **He, Y. T.**, Xie, P. C. Model-Driven Subspaces for Large-Scale Optimization with Local Approximation Strategy. Submitted to *Mathematics of Operations Research* (under review). https://arxiv.org/abs/2509.08256

RESEARCH EXPERIENCE

The anti-Ramsey Number of $K_4^{(3)-}$ **Xi'an, China**
Mentor: Hongliang Lu @ XJTU *July. 2025- present*

- Learned the concept of the anti-Ramsey number and Turan density
- Reviewed classical results and method of determining the anti-Ramsey number of specific graphs and hypergraphs
- Proposed some new ideas on determining upper bound of the anti-Ramsey number of $K_4^{(3)-}$

Model-Driven Subspaces for Large-Scale Optimization with Local Approximation Strategy **Berkeley, CA**
Mentor: Postdoc. Pengcheng Xie @ Lawrence Berkeley National Laboratory *Jan. 2025 – Sep. 2025*

- Designed a novel class of subspaces suitable for classical subspace-based optimization fameworks
- Reviewed the random subspace and trust region method of optimization and the Johnson-Lindenstrauss lemma, JL-embeddings and its applications in optimization
- Refined the assumptions of the convergence of the model 2D-MoSub and provided a systematic method to construct fully-linear models based on models in lower-dimensional subspace

PKU Algebra and Combinatorics Experience (PACE), Beijing International Center for Mathematical Research **Beijing, China**
Mentor: Guoliang Wang @ Beijing Institute of Technology and Long Guo @ Nankai University *July. 2024 – August 2024*

- Explored some topics in algebraic combinatorics, such as matroids, coxeter groups, chromatic symmetric functions, deodhar diagrams, and covering graph
- Partially answered two research problems from the topics of chromatic symmetric function and Deodhar diagram under group collaboration
- Successfully proved the e-positivity of a special class of graph based on the idea of composition method proposed by the team of professor Guoliang Wang

Probability Theory, Shanghai Jiao Tong University **Shanghai, China**
Mentor: Alberto Grünbaum @ UCB *July. 2023 – August 2023*

- Studied topics of random variables, probability distribution, independence, expectation and three limit theorems
- Learned basic skills in academic writing
- Reviewed the recurrence and transience results for different random walk models