

Yihan Guo

Education

University of Chicago	09/2024-Present
M.S. in Computational and Applied Mathematics · GPA: 3.87/4.00	
Fudan University	09/2020-06/2024
B.S. in Mathematics and Applied Mathematics · GPA: 3.81/4.00	

Publications & Preprints

- Gaussian ensembles and invariant probability densities on flag manifolds.

Research Experience

Research Assistant	UChicago
Advisor: Prof. Lek-Heng Lim	
<ul style="list-style-type: none">• Shown that the eigenvector distributions of the Gaussian Orthogonal, Unitary, and Symplectic Ensembles are the unique G-invariant probability distributions on the complete real, complex, and quaternionic flag manifolds respectively. Also, the singular vector distributions of Ginibre Ensembles, as well as the CS vector distributions of Circular Ensembles are the unique G-invariant probability distributions on homogeneous spaces of product spaces of G, in real, complex, and quaternionic cases. These results yield simple and computationally efficient methods for generating uniformly random points on arbitrary flag, Grassmann, and Stiefel manifolds. Results appear in Gaussian ensembles and invariant probability densities on flag manifolds.	

Undergraduate Researcher	Fudan University
Mentor: Prof. Yingzhou Li	
<ul style="list-style-type: none">• Worked on near-term quantum algorithms for finding ground states of quantum Hamiltonians, such as quantum imaginary time evolution and quantum Lanczos.	

Teaching

Teaching Assistant, FINM 34800: Modern Applied Optimization	UChicago
Duties: Creating problem sets, Grading, Holding office hours 2 hours/week.	

Honors

Ministry of Education (China)	National Scholarship, 2021
The most competitive academic performance-based undergraduate honor in China.	

Selected Coursework

- Graduate: random matrix theory, measure-theoretic probability sequence, PDEs, theoretical computer science: analysis of Boolean functions.
- Undergraduate: functional analysis, differential geometry, algebraic topology.