

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

- Flag manifolds and the eigenvectors distributions of random matrix ensembles.

Research Experience

Research Assistant

UChicago

Advisor: Prof. Lek-Heng Lim

- Shown that the eigenvectors 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 vectors distributions of Ginibre Ensembles, as well as the CS vectors 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 Flag manifolds and the eigenvectors distributions of random matrix ensembles.

Undergraduate Researcher

Fudan University

Mentor: Prof. Yingzhou Li

- 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.