

Zhuo Zhang

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Education

- Aug 2021 – **B.S. in Mathematics, Minor in Computer Science,**
May 2025 *University of Illinois at Urbana-Champaign (UIUC), Champaign*
- GPA: 4.0
 - Edmund J. James Scholar, College of Liberal Arts and Sciences
 - Dean's List in all semesters

Graduate Courses Taken

- Spring 2023 Abstract Algebra, Real Analysis
Fall 2023 Differentiable Manifolds 1, Complex Variables, Analytic Number Theory 1
Spring 2024 Differentiable Manifolds 2, Intro to Algebraic Geometry, Representation Theory,
(In Progress) Analytic Number Theory 2
Grades = A+ in all math courses taken in college.

Presentations and Talks

- Oct 2023 *On the Distribution of Primes*, UIUC Analytic Number Theory Course, 3 talks, 90 minutes each
Aug 2023 *An Introduction to Bordism Homology*, UChicago Math REU, 25 minute talk
Sep 2022 *Continued Fractions and the Gauss-Kuzmin Distribution*, UIUC Undergraduate Friday Seminar, 60 minute talk
Aug 2022 *On the Continued Fraction Expansion of Random Real Numbers*, Young Mathematician Conference, 25 minute talk
Jun 2022 *Hecke Algebras and Kazhdan-Lusztig Polynomials*, UIUC ICLUE Seminar, 120 minute talk

Writings and Preprints

- Dec 2023 Zhuo Zhang, *A Geometric View of Bordism Homology*
Dec 2023 Zhuo Zhang, *Notes on Smooth Manifolds*
May 2023 Zhuo Zhang, *On a Special Class of Primes and Their Primitive Roots*
Dec 2022 Alex Jin, Shreyas Singh, Zhuo Zhang, AJ Hildebrand, *On the Continued Fraction Expansion of Almost All Real Numbers*, 17 pp., submitted

Research Experiences

- June 2023 – **UChicago Math Summer REU Program,**
Aug 2023 *Mentors: Peter May & Mark Behrens, UChicago*
- Learned higher algebraic topology and differential topology.
 - Wrote an expository paper on a geometric treatment of bordism homology.
 - Gave a final presentation of the work done in the REU.

Jan 2023 – **Independent Research Project at Honors Seminar,**

May 2023 *Mentor: Bruce Reznick, UIUC*

- Defined a special class of primes known as "Z-primes."
- Studied the properties of Z-primes and their special primitive roots.
- Wrote a paper and proposed a conjecture about the asymptotic density of such special primitive roots, providing a heuristic argument.
- Collected numerical data to provide very strong support the conjecture.

Jan 2022 – **Illinois Geometry Lab Research Project (IGL),**

Dec 2022 *Mentor: AJ Hildebrand, UIUC*

- Studied the Gauss-Kuzmin distribution underlying simple continued fraction expansion of random real numbers.
- Collected data on the distribution of continued fraction digits of π .
- Wrote a paper
- Presented the results of this work at seminars and local and national conferences.

May 2022 – **Representation Theory Summer Program,**

Jul 2022 *Mentor: Alexander Yong, UIUC*

- Read Serre's book *Linear Representation of Finite Groups* and learned related topics in algebraic combinatorics.
- Collaborated with team members to create 60 pages of LaTeX notes on representation theory.
- Gave a 2-hour presentation on Hecke algebras and Kazhdan-Lusztig polynomials.

Directed Readings

Aug 2023 – **Homotopy Theory, Mentor: Charles Rezk, UIUC**

- Dec 2023
- Learned algebraic topology and homotopy theory
 - Read the notes *Homotopy theories and model categories* by Dwyer and Spalinski.

Jan 2024 – **Differential Geometry, Mentor: Eugene Lerman, UIUC**

May 2024

- TBD

Leadership Experiences

Aug 2022 – **President of the Illinois Geometry Lab Outreach Program, UIUC**

- Present
- Reach out to children and students from local communities and present to them interesting topics in mathematics.
 - Introduce technologies involving math to students, such as 3D printing.
 - Organize various outreach events and social events.
 - Coordinate the work between group members.

Aug 2022 – **James Scholar Mentor, UIUC**

- Dec 2022
- Mentored two first-year James Scholar honors students in mathematics.
 - Organized mentorship meetings, study sessions and Q&A sessions to guide the mentees and help them have a smooth transition to college.
 - Helped the mentees find resources for undergraduate research in mathematics and physical sciences.

Skills

Languages Chinese (Native), English (Proficient)

Programming Python (Proficient), C++ (Proficient), Mathematica (Proficient),
LaTeX (Proficient), Java (Intermediate)

Honors and Awards

Apr 2023 LAS Get Experience Scholarship
Mar 2023 Lewis C. Hack Scholarship
Aug 2021 – Edmund J. James Scholar
Present