Yichen Ma

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Appointment

- **Texas State University**

  Assistant Professor of Instruction - Mathematics — Sep 2026 - Present

  Lecturer in Mathematics — Aug 2025 - Aug 2026

Education

- **Cornell University**

  Ph.D. Mathematics — May 2025

- **University of Virginia**

  B.A. in Mathematics, Minor in Economics — May 2019

Papers and Preprints

- **Convex geometries via Hopf monoids: combinatorial invariants, reciprocity, and supersolvability**. (Submitted) arXiv: 2506.00380.
- **Kohnert properties of northeast diagrams**, with Aram Bingham, Beth Anne Castellano, Kimberly Hadaway, Reuven Hodges, Alex Moon, Kyle Salois. *The Electronic Journal of Combinatorics* (2026) 33(3).
- **Involution matrix loci and orbit harmonics**, with Moxuan (Jasper) Liu, Brendon Rhoades, Hai Zhu. *Mathematische Zeitschrift* (2025) 310:23.

Miscellaneous

- **Sofic approximation of groups** (undergraduate thesis). https://doi.org/10.18130/v3-vcz8-w062.

Teaching

- **Texas State University**
  - **Instructor of Record**

    MATH 2472 Calculus II — Fall 2026

    MATH 2471 Calculus I — Fall 2026, Spring 2026, Fall 2025

    MATH 2393 Calculus III (online) — Summer 2026

    MATH 1316 Survey of Contemporary Math — Spring 2026

    MATH 1300 Elementary Algebra — Spring 2026

    MATH 3398 Discrete Math II — Fall 2025

- **Cornell University**
  - **Instructor of Record**

    MATH1110 Calculus I — Fall 2023
  - **Head Teaching Assistant** Assist with coordinating large, multi-sectional courses; coordinate instructors and TA meetings; coordinate discussion sessions and workshops; address various administrative tasks.

    MATH1120 Calculus II (around 140 students) — Spring 2024

    MATH1910 Calculus for Engineers (around 600 students) — Fall 2021
  - **Recitation Leader**

    MATH2940 Linear Algebra for Engineers — Spring 2025, Spring 2023

    MATH1910 Calculus for Engineers — Fall 2020

– **Grader**

MATH4410/5410 Introduction to Combinatorics I — Fall 2022, Fall 2024
MATH3360 Applicable Algebra — Spring 2022
MATH3110 Introduction to Analysis — Spring 2021
MATH1110 Singular Variable Calculus — Summer 2020

- **University of Virginia**

– **Tutor**

MATH1110 Singular Variable Calculus — Fall 2017
MATH1120 Multivariable Calculus — Fall 2017
MATH3310 Basic Real Analysis — Spring 2018

– **Grader**

MATH3354 Survey of Algebra — Spring 2017, Fall 2018

Teaching Talk

- "University teaching principles and scenarios", Cornell University Math Teaching Seminar — Nov 2024

Research Talks and Posters

Talks

- "Topics on Hopf monoids, convex geometries, and supersolvability", Texas State University Algebraic Combinatorics Reading Seminar — Sep 2025
- "Supersolvable convex geometries and the flag vectors associated to Hopf monoids", AMS Spring Central Sectional Meeting, the University of Kansas — Mar 2025
- "Enumeration of Hopf monoid invariants and supersolvable convex geometries", Dartmouth College Combinatorics Seminar — Nov 2024
- "Characters and polynomial invariants on Hopf monoids", CombinaTexas, Texas A&M — Mar 2024
- "Invariants of partial orders and convex geometries via characters on Hopf monoids", Binghamton University Combinatorics Seminar — Mar 2024
- "Enumeration of flags in partial orders and convex geometries", Cornell University Discrete Geometry and Combinatorics Seminar — Mar 2024
- "Invariants of partial orders and convex geometries via characters on Hopf monoids", Graduate Online Combinatorics Colloquium — Nov 2023

  Video Record: $https://www.youtube.com/watch?v=Osi7FMJbSec$
- "Hopf monoids and characters", Binghamton University Graduate Conference in Algebra and Topology Oct 2022

Conference Posters

- "Supersolvable convex geometries", Koi Combinatorics Lectures, Indiana University Bloomington — Oct 2024
- "Hopf monoids and polynomial invariants: a tale of four characters", Algebra, Geometry and Combinatorics Day, Loyola University in Chicago — Apr 2023

Expository Talks

- "Normalized Schur Polynomials are Lorentzian", Cornell University Graduate Student Reading Seminar in Combinatorics — Apr 2023
- "Characterization of Lorentzian Polynomials", Cornell University Graduate Student Reading Seminar in Combinatorics — Feb 2023

Academic Service and Activities

- **Texas State University**
  - **Student Success Innovation Grant** Aug 2026 - Present
    Beyond Office Hours: Embedded Academic and Wellness Support for Gateway Courses
    with Jialong Li (Principal), Zhaoxuan Zhou (Co-Principal), and Xiaoxi Shen
    - Mentor an undergraduate course assistant in adapting active-learning worksheets for MATH 2471 Calculus I, an important undergraduate gateway course, to incorporate scaffolded instructional support, promote effective and responsible use of AI in student learning, and strengthen the worksheets as interactive and accessible study resources.
    - Develop and provide additional academic support resources for Calculus I to improve student engagement, accessibility to course support, and preparation for success in gateway mathematics.
  - **MATH 2471 Calculus I Teaching Forum Leader** Aug 2026 - Present
    - Lead regular meetings of Calculus I instructors to coordinate course progress, share teaching practices, and address instructional challenges.
    - Manage and maintain Calculus I teaching resources through the course's Canvas teaching forum.
    - Help organize Limits and Derivatives Bootcamps.
  - **Mentor of Mathworks Honors Summer Math Camp (HSMC)** June 2026 - Present
    - Led a summer research group of high school students and a graduate student counselor on topics in combinatorics and discrete geometry.
  - **Participation in Texas State University Derivative Bootcamp** Mar 2026, Oct 2025
    - Collaborated with Calculus faculty at Texas State University to support student learning of basic derivative rules in Calculus I through structured worksheets and guided practice activities.
- **Cornell University**
  - **Facilitator for Cornell Math Teaching Assistant Training Program.** Aug 2024
    - Facilitated training for incoming graduate teaching assistants. Presented my teaching philosophy to new graduate teaching assistants.
    - Led teaching warm-up workshops for both instructors and teaching assistants, focusing on teaching strategies, discussing various classroom scenarios, and setting instructional goals.
  - **Mentor of Direct Reading Program (DRP).** Fall 2023
    - Guided a Cornell CS-major undergraduate student through advanced discrete math topics not covered in official classes. Supported the student in preparing a talk based on the materials learned.
  - **Co-organizer of Cornell Graduate Student Reading Seminar in Combinatorics.** Fall 2022 - Fall 2023
    - Organized a new graduate student seminar in combinatorics, providing an opportunity for Cornell math grad students to learn and discuss newly developed theories in combinatorics. Searched for and invited speakers for the weekly seminar and managed scheduling.
  - **Member of Active Learning Initiative (ALI) Summer Project.** Summer 2022
    - Adapted course materials for MATH 4310 (Undergraduate Advanced Linear Algebra) to align with the most recent syllabus and integrated active learning strategies into the curriculum.

Honors and Awards

- **Bachelor of Arts with the Highest Distinction** May 2019
- **Edwin E. Floyd Prize** (Awarded by the University of Virginia Department of Mathematics) Mar 2018
- **Dean's List** 2017, 2018, 2019

Skills

- **Programming:** Python, Sage Mathematics
- **Languages:** English (fluent), Chinese (native)
- **Other:** Microsoft Word, Excel, PowerPoint, LaTeX, Beamer, Mailchimp.