Shashank Pratap Singh

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Profile

Ph.D. candidate in Mathematics (Expected 2026) specializing in representation theory, Hopf algebras, and tensor categories. Seeking a postdoctoral position that combines advanced research in algebraic structures with meaningful teaching opportunities. Research focuses on generalizing results from classical representation theory like Gabriel's Theorem to tensor categories.

Research Interests

- **Primary Interests:** Representation theory, Hopf algebras, Tensor categories, Quiver representations, Category Theory
- **Specific Focus:** Generalizations of Gabriel's theorem, Taft algebras, module categories, algebraic structures in tensor categories

Education

Ph.D. in Mathematics, University of Iowa — Expected 2026
Advisor: Prof. Ryan Kinser
Dissertation: "Quivers and Tensor Categories: Toward a Generalization of Gabriel's Theorem"

B.S & M.S. in Mathematics,
Indian Institute of Science Education and Research, Pune, India — 2018
Master's Thesis: "Class Field Theory and Tate's Thesis"

Presentations

Conference Presentations

- **Module categories in the representation category of Taft algebras**
  QuaSy-Con III, Iowa State University — November 2025
- **Algebra objects in the representation category of Taft algebras**
  AMS Sectional Meeting, St. Louis, MO — October 2025
- **Tensor Algebras in the Representation Category of Taft Algebras**
  Hopf25, ULB Brussels — April 2025
- **Understanding Hopf Algebra Representations through Quivers**
  AMCS-MATH Day, University of Iowa — September 2024

Seminar Talks

- **Tensor Algebras in Tensor Categories**
  Algebra Seminar, Saint Louis University — November 2024

- **Tensor Algebras in Tensor Categories**
  Algebra Seminar, University of Iowa — October 2024
- **Exact Module Categories and Module Algebras**
  Algebra Seminar, University of Iowa — February 2024

Outreach and General Audience Talks

- **Scissors, Shapes, and Tensor Products**
  GAUSS, University of Iowa — May 2025
- **The ABCs of Algebraic Geometry**
  GAUSS, University of Iowa — October 2023

Teaching Experience

Instructor of Record, University of Iowa

- **College Algebra** (Spring 2023, Fall 2023, Fall 2024, Fall 2025)
  Taught in a coordinated multi-section course (typically 15–20 sections) with 35–40 students per section. Collaborated with other instructors to maintain consistent standards and assessments across all sections
- **Elementary Functions** (Fall 2022)
  Taught full course with 35–40 students, responsible for all aspects of instruction

Teaching Assistant, University of Iowa

- **Introduction to Abstract Algebra** (Spring 2025)
  Led discussion sections and provided individualized student support
- **Engineering Math I: Single Variable Calculus** (Spring 2022)
  Conducted discussion sessions and graded assignments
- **Qualifying Exam Preparation Seminars (Algebra)** (Summer 2023)
  Organized and led intensive review sessions for graduate students

Tutoring and Academic Support

- **Math Platoon** (Spring 2022, Spring 2025, Fall 2025)
  Provided specialized tutoring support for army veterans enrolled in university mathematics courses
- **Math Tutorial Lab** (Spring 2022, 2023, 2025; Fall 2022, 2023, 2024, 2025)
  Delivered comprehensive tutoring services to students across various mathematics courses

Technical Skills

- **Mathematical Software:** SageMath, LaTeX
- **Programming:** Python, C++
- **Mathematical Typesetting:** Advanced LaTeX, TikZ, Beamer

Awards and Fellowships

- **Erwin and Peggy Kleinfeld Scholar**,
  Department of Mathematics, University of Iowa — Fall 2023–Spring 2026
- **Kleinfeld Math Graduate Recruitment Fellowship**,
  Department of Mathematics, University of Iowa — Fall 2021–Summer 2022
- **INSPIRE Scholarship**,
  Department of Science & Technology, India — Fall 2013–Spring 2018

Service and Outreach

- **Directed Reading Program** (Fall 2024)
  Mentored undergraduate student Grant Trentz in Cryptography and Number Theory
- **Graduate Student Reading Group Organizer**
  Selected materials and coordinated weekly discussions for 6–8 graduate students:
  – Hopf Algebras (Spring 2024)
  – Lie Algebras and their Representations (Fall 2023)
  – Tensor Categories (Spring 2023)