Soumyadeep Misra

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Education

University of Kansas, Lawrence, USA **August. 2024 – Now**
PhD in Mathematics *Advisor: Prof. Hai Long Dao*

Indian Institute Of Technology Madras, Chennai, India **July. 2022 – May 2024**
Master of Science in Mathematics *CGPA-8.81*

St Xavier's College(Autonomous), Kolkata, India **June. 2019 – May 2022**
Bachelor of Science in Mathematics *CGPA-8.33*

Teaching Experience

University of Kansas **Lawrence, USA**
Instructor of Record

- MATH 115 (Spring 2026)
- MATH 104 (Fall 2025)
- MATH 101 (Fall 2024)

University of Kansas **Lawrence, USA**
Teaching Assistant

- MATH 125 (Summer 2025)
- MATH 126 (Spring 2024)

Projects

Integral Closure of Ideals and Rings (*Master's Thesis*) **January 2024-May 2024**

- ***Guide: Dr. A.V. Jayanthan, Professor, Department of Mathematics, IIT Madras***
- In this project, our primary objective was to delve into the integral closure of ideals and rings, exploring various methodologies for their computation
- Additionally, we explored the correlation with Rees algebra to facilitate the determination of integral closures of ideals
- Later on, we examined the integral closure of edge ideals and proved a theorem stating that Edge ideals are always normal ideals

Gröbner basis and Resolution (*Master's Reading Project*) **August 2023-December 2023**

- ***Guide: Dr. Sarang Sane, Assistant Professor, Department of Mathematics, IIT Madras***
- Learned to compute Gröbner basis for toric ideals, solving ideal membership test, calculate minimal free resolutions of ideals using Gröbner basis
- Used *Macaulay2* to compute generators of an ideal, Gröbner basis, minimal free resolutions, etc.

Introduction To Geometric Group Theory (*Summer Research Project*) **May 2023-July 2023**

- ***Guide: Dr. Kashyap Rajeevsarathy, Associate Professor, Department of Mathematics, IISER Bhopal***
- Explore Quasi-Isometry, Free Groups, Folding, and Covering Spaces by solving exercises in "Office Hours with a Geometric Group Theorist" by Matt Clay and Dan Margalit.
- Identified and corrected some errors and faulty proofs in "Office Hours with a Geometric Group Theorist."

Revisit to Riemann Hypothesis under Bayesian Characterization *(Undergrad Dissertation)* **May 2022**

- ***Guide: Dr. Sucharita Roy, HoD, Department of Mathematics, St Xavier's College(Autonomous), Kolkata***
- In this paper, we constructed a Bayesian approach for the convergence of infinite series.
- As proposed in the paper, we illustrated our idea on different examples of series, most importantly on the Dirichlet series of the Mobius function whose convergence is equivalent to the Riemann hypothesis on a certain interval.
- Based on our outcome, we concluded that the Riemann Hypothesis can't be fully supported.

Certified Online Course

Computational Commutative Algebra **July 2023-November 2023**

- ***Course Instructor: Dr. Manoj Kummini,Chennai Mathematical Institute(CMI)***
- Registered for the course on NPTEL(National Programme on Technology Enhanced Learning ,India)
- Learned **Macaulay2** and acquired skills in computing algebraic varieties.
- Achieved certification as one of the five students in this course. (View certificate)

Conferences and Workshops

KUMUNU 2025 **October 25-26, 2025**
University of Missouri *Columbia, MO*

URiCA 2025 **May 3-4, 2025**
University of Nebraska-Lincoln *Lincoln, NE*

Rayfest 2025 **April 12-13, 2025**
University of Nebraska-Lincoln *Lincoln, NE*

AMS Spring Central Sectional Meeting **March 29-30, 2025**
University of Kansas *Lawrence, KS*

Commutative algebra in mixed characteristic **March 28-29, 2025**
University of Nebraska-Lincoln *Lincoln, NE*

KUMUNU 2024 **September 28-29, 2024**
University of Missouri *Columbia, MO*

Indian Women and Mathematics (IWM) Annual Conference **July 13-15, 2023**
IISER Bhopal *Bhopal, India*

- Talk: "Reduction number, Ratliff-Rush filtration, and Hilbert coefficients" by Kumari Saloni
- Talk: "F-thresholds of symbolic power filtration..." by Mitra Koley

Workshop on Representation Theory and Syzygies **December 18-23, 2023**
National Centre of Mathematics *India*

- Talk: "Pure resolutions and Boij-Soederberg conjectures" by Dr. Manoj Kummini

IIT Madras Seminar Series **April 21, 2023**
Indian Institute of Technology Madras *Chennai, India*

- Talk: "Homogeneous Length Functions on Groups" by Dr. Apoorva Khare

Technical Skills

Commutative Algebra Tools: Macaulay2
Languages: C,R
Developer Tools: Matlab, Minitab,LateX
MS Tools: Word, Excel, Powerpoint