Kriti Sehgal
Preceptor in Data Science
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The University of Chicago
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Research Interests: Data Science, Mathematical Analysis.

Work Experience

Data Science Institute, University of Chicago . . . . . Chicago, IL, USA
Preceptor in Data Science . . . . . Jul 2024 - Current

Wolfram|Alpha . . . . . Champaign, IL, USA
Scientific content development intern . . . . . Jun 2023 - Aug 2023

Education

The Ohio State University (OSU) . . . . . Columbus, OH, USA
PhD Mathematics . . . . . Aug 2018 - Apr 2024

– Advisor: Prof. Ovidiu Costin

MS Mathematics . . . . . Aug 2018 - Jul 2021

Indian Institute of Science (IISc) . . . . . Bangalore, India
MS Mathematics . . . . . Jul 2015 - Jun 2018

– Advisor: Prof. Tirthankar Bhattacharyya

University of Delhi (DU) . . . . . Delhi, India
B.Sc. (Honors) Mathematics . . . . . Jul 2012 - May 2015

Research Papers

1. *On the pointwise existence of Cauchy P.V. integrals*, with O. Costin and N. Castillo
(arXiv link: https://arxiv.org/abs/2311.13392).

2. *Long time evolution of the Hénon-Heiles system for small energy*, with O. Costin and R. Costin
(arXix link: https://arxiv.org/abs/2411.16071).

Teaching and Mentorship

Trainings

Professional development training for the City Colleges of Chicago (CCC) . . . . Fall 2024, Spring 2025

Instructor

DATA 118 - Introduction to Data Science, UChicago . . . . . Spring 2025
Math 125 - Introduction to Statistics, Olive-Harvey College . . . . . Spring 2025

Graduate Teaching Associate

Math 1149 - Trigonometry, OSU . . . . . Spring 2024
Math 2173 - Calculus III (Engineering Mathematics B), OSU . . . . . Fall 2023
Math 1131 - Calculus for Business, OSU . . . . . Spring 2022
Math 1156 - Calculus for Biological Sciences, OSU . . . . . Fall 2021
Math 2153 - Calculus III, OSU . . . . . Spring 2021
Math 1172 - Calculus II (Engineering Mathematics), OSU . . . . . Fall 2020
Math 1172 - Calculus II (Engineering Mathematics), OSU . . . . . Spring 2020
Math 1151 - Calculus I, OSU . . . . . Fall 2019
UM 101 - Undergraduate Analysis and Linear Algebra, IISc . . . . . Fall 2017

Mentorship

Mentor at Data Science for Social Impact Summer Experience, UChicago . . . . . Summer 2025
Mentor at Data Science Clinic program, UChicago . . . . . Fall 2024, Winter 2025, Spring 2025
Mentor at Directed reading program, OSU . . . . . Fall 2021
Mentorship and teaching support to train new teaching associates, OSU . . . . . Fall 2021

Awards and Achievements

1. 2023 SIAM Student Chapter Certificate of Recognition acknowledging exceptional service to OSU's SIAM Chapter.
2. 2023 Graduate Associate Teaching Award (GATA), OSU's highest honor for exceptional graduate teaching associates.
3. 2022 Phil Huneke Distinguished Graduate Teaching Associate Award by Math department at OSU.
4. Nominated for 2021 Graduate Student Leadership Award, OSU's highest recognition for student leadership.
5. Qualified National Eligibility Test for Lectureship (NET), India in Mathematics.
6. All India Rank 05 in Joint Admission Test for M.Sc. (JAM), Mathematics, 2015.
7. First Position in undergraduate studies at University of Delhi.

Talks

Data4All Guest Speaker (Invited talk) . . . . . University of Chicago, IL - Nov 23, 2024
SIAM Great Lakes Conference (Invited talk) . . . . . East Lancing, MI - Oct 14, 2023
Joint Math Meetings AWM Poster Presentation . . . . . Online - Jan 08, 2021

Projects

1. Mathematical problems in industry (MPI 2024): Analyzed Vironix Health's de-identified datasets detailing the disease progression in patients undergoing remote patient monitoring to understand positive health outcomes that have emerged from patient monitoring efforts, to predict adverse patient episodes, patient complaince and engagement.

2. Mathematics behind the Hénon-Heiles system: Developing a rigorous mathematical theory, using asymptotic analysis and numerical simulations, to explain the long-term dynamics of the famous astrophysics system called the Hénon-Heiles system.

3. Generalization of Plemelj formula: Proving the application of Plemelj's formulas from Hölder continuous functions to the broader domain of functions.

4. Erdős Institute data science boot camp Fall 2023: Building predictive model to forecast the behavior of S&P 500 index. Our ultimate goal is to compare the models that give the best results across popular stock indices.

5. Wolfram|Alpha: Contributed to a project aiming to extract and validate mathematical assertions from scientific papers. Ensured accurate interpretation of LaTeX commands, debugged, reduced the error messages through pattern matching, regular expressions, and string manipulations.

6. Mathematical problems in industry (MPI 2022): Performed exploratory data analysis examining hospital admission data sets to identify crucial patterns and features relevant to heart failure. Studied the correlations among several features and symptoms to predict the severe/non-severe presentations of Heart Failure.

7. Graduate student math modeling camp (GSMMC 2022): Analyzed geospatial travel data to identify and model trade-offs between data transparency, privacy, and utility. Utilized statistical methods and randomization techniques to enhance privacy while preserving data usefulness.

8. Erdős Institute data science boot camp May 2021: Utilized advanced data analytics techniques to identify key factors that contributed to the successful completion of clinical trials for cancer intervention. Used predictive modeling methods such as K-nearest neighbors, Decision Trees, and Support Vector Machines to determine whether a given trial would be successful.

9. M.S. thesis: Studied the notion of holomorphicity, in a general setting, for a function defined on an open subset of the complex plane and taking values in a locally convex topological vector space.

Leadership and Service

1. President, Society for industrial and applied mathematics (SIAM) chapter at OSU . . Aug 2022 - Apr 2023
2. Vice-President, Association for Women in Mathematics (AWM) chapter at OSU . . Aug 2021 - Apr 2023
3. Vice-President, Mathematics graduate student association at OSU . . . . . Aug 2020 – May 2022
4. Founder and organizer, Student analysis seminar in Math department at OSU . . . . Jan 2020 – May 2022
5. Ohio Union Activities Board Graduate/Professional committee member at OSU . . . Nov 2020 - Dec 2021
6. Graduate student representative of the Math department's Diversity committee at OSU Aug 2020 - May 2021
7. Outreach Coordinator, Society for industrial and applied mathematics chapter at IISc Aug 2017 - May 2018

Conferences, Workshops, and Summer Schools

1. National Workshop on Data Science Education: *June 24-27, 2025*.
2. Mathematical Problems in Industry (MPI 2025).
3. SIAM Workshop "From Machine Learning to Large Language Models - An Introduction": *October 20, 2024*.

4. Teaching In The Generative AI Landscape at University of Chicago: *September 4-5, 2024*.
5. Mathematical Problems in Industry (MPI 2024).
6. The Erdős institute Fall 2023 Data Science Boot Camp.
7. Mathematical Problems in Industry (MPI 2022).
8. Graduate Students Mathematical Modeling Camp 2022.
9. The Erdős Institute Data Science Boot Camp May 2022.
10. 55th Topology Festival held at Cornell University, USA: *May 10-12, 2019*.
11. Graduate Student Combinatorics Conference held at the Drexel University and the University of Pennsylvania, USA: *April 5- April 7, 2019*.
12. Recent advances in Functional Analysis held at the Kent State University, USA: *October 11- October 14, 2018*.
13. Instructional School for Teachers (IST) on Advanced Linear Algebra held at the Indian Institute of Technology Gandhinagar (IITGN), India: *July 10- July 22, 2017*.
14. Indian Academy of Sciences Summer Research Fellowship 2016 under the guidance of Prof. Jaydeb Sarkar at the Indian Statistical Institute (ISI), Bangalore, India: *May 02–June 27, 2016*.
15. Worked as a student volunteer in organising "2nd Residential Internship Program for Child Scientists" in the Indian Institute of Science Education and Research (IISER), Mohali, India: *June 22–July 04, 2015*.
16. Indian Institute of Science Education and Research (IISER) Mohali Summer Internship program under the guidance of Prof. I.B.S. Passi at IISER Mohali, India: *June 01–June 30, 2015*.
17. Mathematics Training and Talent Search Programme (MTTS, Level-O) at the Indian Institute of Technology Guwahati (IITG), India: *June 23–July 19, 2014*.
18. National Program on Differential Equations: Theory, Computation and Applications (NPDE-TCA) held at the Maulana Azad National Institute of Technology (MANIT), Bhopal, India: *May 26–June 14, 2014*.

Skills

- Technical: Python (NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn), Wolfram Mathematica, LaTeX, Github, MS Office.
- Soft skills: Collaboration, Leadership, Team-player, Verbal and written communication, Organization, Problem-solving.