Kriti Sehgal

Preceptor in Data Science, Data Science Institute, The University of Chicago
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Research and Teaching Interests: Data Science, Mathematical Analysis, Data Science and Mathematics Education.

EDUCATION

The Ohio State University (OSU) — Columbus, OH, USA
PhD, Mathematics (advisor: Prof. Ovidiu Costin) — *Aug 2018 – Apr 2024*
MS, Mathematics — *Aug 2018 – Jul 2021*

Indian Institute of Science (IISc) — Bangalore, India
MS, Mathematics (advisor: Prof. Tirthankar Bhattacharyya) — *Jul 2015 – Jun 2018*

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

WORK EXPERIENCE

Data Science Institute, University of Chicago — Chicago, IL, USA
Preceptor in Data Science — *Jul 2024 – Present*

Wolfram|Alpha — Champaign, IL, USA
Scientific content development intern — *Jun 2023 – Aug 2023*

TEACHING EXPERIENCE

Teaching portfolio, syllabi, and student evaluations: kritisehgal01.github.io

University of Chicago, *Instructor of Record*

- DATA 211 – Mathematical Methods for Data Science I — Fall 2026
- DATA 231 – Machine Learning Fundamentals: Theory and Practice — Fall 2026, Spring 2026
- DATA 10018 – Pathways in Data Science — Summer 2026
- DATA 213 – Models in Data Science, Co-instructor — Spring 2026
- DATA 119 – Introduction to Data Science II — Winter 2026
- DATA 119 Labs – Introduction to Data Science II — Spring 2026, Fall 2025
- DATA 118 – Introduction to Data Science I — Spring 2025

City Colleges of Chicago (CCC), *Instructor of Record*

- CIS 175 – Introduction to Data Science, Olive-Harvey College — Fall 2026
- MATH 118 – General Education Math, Kennedy-King College — Spring 2026
- MATH 125 – Introduction to Statistics, Olive-Harvey College — Spring 2025

The Ohio State University (OSU), *Graduate Teaching Associate*

- MATH 1149 – Trigonometry — Spring 2024
- MATH 2173 – Calculus III (Engineering Mathematics B) — Fall 2023
- MATH 1131 – Calculus for Business — Spring 2022
- MATH 1156 – Calculus for Biological Sciences — Fall 2021
- MATH 2153 – Calculus III — Spring 2021
- MATH 1172 – Calculus II (Engineering Mathematics) — Spring 2020, Fall 2020
- MATH 1151 – Calculus I — Fall 2019

Indian Institute of Science (IISc), *Teaching Assistant*

- UM 101 – Undergraduate Analysis and Linear Algebra — Fall 2017

CURRICULUM DEVELOPMENT

Courses and Programs

- **Community College Partnership and Course Development:** Developed and launched a data science curriculum for middle college students at Olive-Harvey College (CCC), which I currently teach. Designing for this population called for substantial new course creation and careful adaptation of content, pacing, and activities to students' backgrounds and needs, with the goal of expanding access to data science education in Chicago.
- **Pathways in Data Science Curriculum Development (Summer 2026):** Developed the curriculum for a summer immersive data science program at UChicago for advanced high school students from around the world.
- **Lab Curriculum Review and Facilitation:** Reviewed and proofread lab materials for DATA 119 and facilitated the weekly laboratory and recitation sessions (Fall 2025), as part of a teaching research initiative examining the impact of mandatory lab components on student learning outcomes in data science courses.

Book Chapters

1. London, J. and Sehgal, K. **DataFrames**. In *The Chicago Guide to Data Science*. University of Chicago Data Science Institute. Available online at link and on my website.
2. Sehgal, K. **Introduction to Machine Learning**. In *The Chicago Guide to Data Science*. University of Chicago Data Science Institute. Available online at link and on my website.
3. Sehgal, K. **Neural Networks and Deep Learning**. In *The Chicago Guide to Data Science*. University of Chicago Data Science Institute. Available online at link and on my website.
4. Sehgal, K. **Tree Models**. In *The Chicago Guide to Data Science*. University of Chicago Data Science Institute. Available online at link and on my website.

MENTORSHIP

University of Chicago

- Data Science Clinic program — Fall 2026, Winter 2026, Spring 2025, Winter 2025, Fall 2024
- Data Science for Social Impact Summer Experience — Summer 2025

The Ohio State University (OSU)

- Directed reading program — Fall 2021
- One-on-one mentorship and teaching support to train new teaching associates — Fall 2021

AWARDS AND ACHIEVEMENTS

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

RESEARCH PROJECTS

Publications and Thesis

1. Long time evolution of the Hénon-Heiles system for small energy, *Journal of Mathematical Physics 66, no. 9, 2025*, O. Costin, R. Costin, K. Sehgal.
2. On the pointwise existence of Cauchy P.V. integrals, (*Under Peer Review*, arXiv), N. Castillo, O. Costin, K. Sehgal.
3. PhD thesis: Dynamics of the Hénon-Heiles System and Generalizing the Sokhotski-Plemelj Formula.
4. M.S. thesis: Duality for Spaces of Holomorphic Functions into a Locally Convex Topological Vector Space.

Selected Projects in Data Science Workshops

1. Data Science for Social Impact Summer 2025: Supervised an undergraduate project on developing a Chatbot (called *Seedbot*) that parses legal documents and answers questions about seed laws of 78 countries in simplified language; *poster published*.
2. Mathematical Problems in Industry (MPI 2025): Collaborated with Kwaai, an open-source AI lab, to study privacy-preserving query methods for vector databases in Personal AI. Explored encryption techniques like dimensional scrambling, noise injection, ElGamal, and CKKS, and developed and evaluated new homomorphic encryption algorithms.
3. Mathematical Problems in Industry (MPI 2024): Analyzed Vironix Health's de-identified datasets on disease progression during remote patient monitoring to identify positive health outcomes and predict adverse episodes, patient compliance, and participation.
4. Wolfram|Alpha: Contributed to a project extracting and validating mathematical assertions from scientific papers, using LaTeX parsing, pattern matching, and regular expressions.
5. 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.

LEADERSHIP AND SERVICE

- Teaching Assistant (Volunteer), Statistics for Machine Learning, Data Science, and Artificial Intelligence training program for undergraduates by MTTS, India — Oct 11 – Nov 8, 2025
- President, Society for Industrial and Applied Mathematics (SIAM) chapter at OSU — Aug 2022 – Apr 2023
- Vice-President, Association for Women in Mathematics (AWM) chapter at OSU — Aug 2021 – Apr 2023
- Vice-President, Mathematics graduate student association at OSU — Aug 2020 – May 2022
- Founder and organizer, Student analysis seminar in Math department at OSU — Jan 2020 – May 2022
- Ohio Union Activities Board Graduate/Professional committee member at OSU — Nov 2020 – Dec 2021
- Graduate student representative of the Math department's Diversity committee at OSU — Aug 2020 – May 2021
- Outreach Coordinator, Society for Industrial and Applied Mathematics chapter at IISc — Aug 2017 – May 2018

TALKS

- Data4All Guest Speaker (Invited talk), University of Chicago, IL — Nov 23, 2024
- SIAM Great Lakes Conference (Invited talk), East Lansing, MI — Oct 14, 2023
- Joint Math Meetings AWM Poster Presentation, Online — Jan 8, 2021

PROFESSIONAL DEVELOPMENT

Trainings

- **Professional development training with the City Colleges of Chicago (CCC), Fall 2024 – Spring 2026:** A comprehensive faculty development program focused on evidence-based pedagogy, inclusive teaching practices, classroom action research, and reflective practice in preparation for a career in higher education.

Selected Conferences, Workshops, and Summer Schools

1. National Workshop on Data Science Education: *June 22–24, 2026; June 24–27, 2025*.
2. Mathematical Problems in Industry (MPI): *June 14–18, 2026; June 9–13, 2025; June 25–29, 2024; June 13–17, 2022*.
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. The Erdős Institute Data Science Boot Camp: *Aug–Dec, 2023; May 2022*.
6. Graduate Student Math Modeling Camp 2022: *June 8–11, 2022*.
7. Instructional School for Teachers (IST) on Advanced Linear Algebra held at the Indian Institute of Technology Gandhinagar (IITGN), India: *July 10–22, 2017*.
8. Indian Academy of Sciences Summer Research Fellowship 2016 under the guidance of Prof. Jaydeb Sarkar at the Indian Statistical Institute (ISI), Bangalore, India: *May 2–June 27, 2016*.
9. 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 1–June 30, 2015*.
10. Mathematics Training and Talent Search Programme (MTTS, Level-O) at the Indian Institute of Technology Guwahati (IITG), India: *June 23–July 19, 2014*.
11. 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*.

TECHNICAL SKILLS

- **Programming and Tools:** Python, Wolfram Mathematica, LaTeX, Github.
- **Teaching Platforms:** Canvas, Brightspace, Gradescope, Ed Discussion.