

KATIE KRUZAN

Chicago, IL

(843)475-2759

hello@katiekruzan.com

Professional Summary

Driven professional, energetic and passionate about the field of mathematics, especially the positive impact it can bring to a community. Research interests include applications of graph theory and computational algebra to the social and natural sciences.

Education

Doctor of Philosophy: Mathematics University of Illinois at Chicago	August 2022 – Expected May 2027 Chicago, IL
Master of Science: Industrial Mathematics Middle Tennessee State University	August 2018 – December 2021 Murfreesboro, TN
Bachelor of Science: Applied Discrete Mathematics Bachelor of Arts: Religious Studies Belmont University	August 2014 – May 2018 Nashville, TN
Associate of Arts: Mathematics Santa Fe College	May 2014 Gainesville, FL

Research

I am a part of Bhaskar DasGupta's Research group working on analyzing properties of biological and social networks, and creating new algorithms to do so.

I work with Jan Verschelde exploring Tropical Algebraic Geometry and its applications

Publications & Preprints

K. Kruzan. [*Explorations On Conjugations of Local Rotations*](#). Ann Arbor, MI: ProQuest LLC, 2021

Teaching

Instructor of Record

- Young Scholars Program at UIC (Su24)
- MATH 088: Intermediate Algebra Workshop (F24)
- MATH 090: Intermediate Algebra (F23)
- MTH 1010: Quantitative Literacy and Reasoning (S22, F21)

Teaching Assistant

- MATH 105: Mathematical Reasoning (S24, F24)
- MATH 110: College Algebra (F22)
- MATH 181: Calculus II (S25)
- MCS 260: Introduction to Computer Science (S23, Su23)
- MCS 360: Introduction to Data Structures (F23)
- MCS 401: Computer Algorithms I *grader* (Su23, Su24)

Outreach/Service

- I am co-president for Symbols of Inclusion at UIC, an organization focused on diversity and equity in mathematics. I have been serving since 2024.
- I am co-organizer for the Computer Science Theory seminar at UIC since 2024
- I am co-organizing the 2026 edition of the Graduate Student Combinatorics Conference that will be hosted at UIC.
- I am a graduate mentor for the Directed Reading Program at UIC. Mentoring the following students:

- o Juan Rosendo | Spring 2024 | Models of Random Graphs
 - o Bill Shepelak | Fall 2024 | Wanna solve Hilbert's Tenth? Think again
- I was an instructor for the Young Scholars Program at UIC, a free summer math camp for high schoolers in the Chicago area in Summer 2024.
- I was co-president for the Mathematics Graduate Student Association at UIC for the 2023- 2024 academic year.
- I served in leadership for Belmont University's joint chapter of the Mathematical Association of America and the Association for Computing Machinery from March 2015 – May 2018.

Talks

- “An Application of Entropy to Counting Proper Colorings of a Regular Graph”, Graduate Combinatorics, Algorithms, and Probability Seminar at UIC, October 2024
- “Algorithmic Game Theory: Nash Equilibria”, Computer Science Theory Seminar at UIC, February 2024
- “Self-Improving Algorithms”, Computer Science Theory Seminar at UIC, November 2023
- “A Note on Pseudorandom Graphs”, Graduate Combinatorics, Algorithms, and Probability Seminar at UIC, October 2023
- “*Online Ramsey Numbers*”, Graduate Combinatorics, Algorithms, and Probability Seminar at UIC, March 2023
- “*Inclusion matrices and the Linear Algebra Method*”, Graduate Combinatorics, Algorithms, and Probability Seminar at UIC, November 2022

Awards and Achievements

UIC Kathy Hill Cawthon Memorial Award (*2024 Recipient*) The Kathy Hill Cawthon Award is given annually to an outstanding undergraduate or graduate student in the MSCS Department.

Belmont University Raymond H Medley, Jr. Outstanding Senior Mathematics Award (*2018 Recipient*) This award recognizes the senior student who best demonstrates a high level of performance in mathematics courses, high level of community engagement, clear potential for further study, and a positive attitude towards learning.

Belmont University Stephen R. Campbell Mathematics and Computer Science Award (*2015 Recipient*): This award recognizes the student who best demonstrates a high level of performance in introductory mathematics or computer science courses, clear potential for further study, and a positive attitude towards learning.

Belmont University Alpha Chi National Honor Scholarship Society (March 2015 – present) Membership to this honor society is extended only to university juniors and seniors who rank in the top 10 percent of their classes and who demonstrate leadership and outstanding moral character.

Relevant Employment Experience

Applied Mathematics Consultant
Katie Kruzan, LLC

December 2020 - present
Chicago, IL

- Offered Applied Mathematics and Machine Learning support to clients in the healthcare, technology, and music sectors.
- Key projects included:
 - o Data Analytics lead. Introduced data science and machine learning tooling and application to increase business insight and promote data-led decision-making.
 - o Master data management effort. Architected and implemented a data warehouse to allow for easy analytics
 - o Meta-analysis creation. Synthesized results from multiple published academic papers to create a model using the results from all the studies.

Product Manager
Perception Health

May 2017 - January 2021
Brentwood, TN

- Promoted 2x during tenure from Intern to Mathematician to Product Manager
- Launched two products to market in 2020 and laid groundwork to release another in 2021.

- Created, developed, and managed a physician scoring and matching algorithm product to help find the ideal provider for any situation.
- Managed and aided in the development of disease prediction machine learning models to detect disease states before they are diagnosed.
- Developed a solution to find the best team of doctors for a particular patient using an application of a Minimal Spanning Tree Problem and Prim's algorithm.
- Analyzed large amounts of data (database of 26+ billion records) using Python, SQL, and Java.