

HALEY COLGATE KOTTLER

haley.kottler@wisc.edu

EDUCATION

University of Wisconsin-Madison

Doctoral Program in Mathematics
Masters of Arts in Mathematics

August 2020 - present
August 2022

Enhancing Diversity in Graduate Education

Summer 2020

Colorado College

Bachelor of Arts with Distinction in Mathematics, cum laude
Pi Mu Epsilon, Phi Beta Kappa

May 2020
GPA: 3.9

RESEARCH FOCUS

Current work focuses on addressing societal problems using applied probability, causal inference, modeling, and machine learning.

RESEARCH EXPERIENCE

Data Analyst Project Assistant

Gilmore-Bykovskyi Lab, Department of Emergency Medicine

University of Wisconsin - Madison
Spring 2024

Research Assistant

Institute for Foundations of Data Science
Advisors: Amy Cochran and Jose Israel Rodriguez

University of Wisconsin - Madison
Spring 2023

Research Assistant

Advisor: Jose Israel Rodriguez

University of Wisconsin - Madison
Summer 2022

Research Assistant

Advisor: Amy Cochran

University of Wisconsin - Madison
Spring 2021

Student Collaborative Research

Advisor: Beth Malmskog

Colorado College
Summer 2019

REU in Coding, Cryptography, and Number Theory

Advisor: Felice Manganiello

Clemson University
Summer 2018

PUBLICATIONS

Quantifying aberrant approach-avoidance conflict in psychopathology: A review of computational approaches. by Allison M. Letkiewicz, **Haley C. Kottler**, Stewart A. Shankman, and Amy L. Cochran. Neuroscience & Biobehavioral Reviews. 147 (2023). <https://doi.org/10.1016/j.neubiorev.2023.105103>

Colorado in context: Congressional redistricting and competing fairness criteria in Colorado. by Jeanne Clelland, **Haley Colgate**, Daryl DeFord, Beth Malmskog, and Flavia Sancier-Barbosa. (Authors alphabetical by last name.) Journal of Computational Social Science. 1-38 (2021). <https://doi.org/10.1007/s42001-021-00119-7>

Batch Codes from Affine Cartesian Codes and Quotient Spaces, by Travis Baumbaugh, **Haley Colgate**, Timothy Jackman, and Felice Manganiello. (Authors alphabetical by last name.) Cryptography and Coding - 18th IMA International Conference, IMACC 2021, Virtual Event, December 14-15, 2021, Proceedings, 13129(3-15), https://doi.org/10.1007/978-3-030-92641-0_1,

PREPRINTS

Integrating Local Learning into the Two-Stage Markov Task to Separate Model-Based from Model-Free Learning by Peizhe Li, Jimmy Vineyard, Seungyeon Oh, Jack Maloney, Amy Cochran, and **Haley Colgate Kottler**, May 12, 2024. <https://doi.org/10.31234/osf.io/hmt2a>

WORKS IN PROGRESS

Confounding by Indication with Proxy Variables, by **Haley Kottler** and Amy Cochran.

Implementation of Estimating Gaussian Mixtures Using Sparse Polynomial Moment Systems, by **Haley Kottler**, Julia Lindberg, and Jose Israel Rodriguez.

TEACHING EXPERIENCE

Math 96: Preparatory Algebra <i>Lecturer Student Assistant</i>	University of Wisconsin - Madison <i>Fall 2023</i>
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Math 319: Techniques in Ordinary Differential Equations <i>Lecturer Student Assistant</i>	University of Wisconsin - Madison <i>Summer 2023</i>
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Math 211: Calculus <i>Head Teaching Assistant</i>	University of Wisconsin - Madison <i>Spring 2022, Fall 2022, Spring 2023</i>
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Math 211: Calculus <i>Teaching Assistant</i>	University of Wisconsin - Madison <i>Fall 2021</i>
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Math 221: Calculus and Analytic Geometry 1 <i>Teaching Assistant</i>	University of Wisconsin - Madison <i>Fall 2020</i>
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Quantitative Reasoning Center <i>Mathematics Tutor</i>	Colorado College, CO <i>Fall 2018 - Spring 2020</i>
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Mathematics Department <i>Grader</i>	Colorado College <i>Fall 2017 - Spring 2018</i>
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PRESENTATIONS

Graduate Applied Mathematics Seminar, Madison WI <i>Reinforcement Learning as a Model for Dog Training</i>	February 2024
Graduate Applied Mathematics Seminar, Madison WI <i>Causal Inference with Proxy Variables</i>	October 2023
Institute for Foundations of Data Science Annual Meeting, Madison WI <i>Method of Moments for Gaussian Mixtures: Algebra to Implementation</i>	August 2023
UW Madison Institute for Foundations of Data Science Seminar, Madison WI <i>Confounding by Indication with Proxy Variables</i>	March 2023
UW Madison SIAM Seminar, Madison WI <i>Gaussian Mixture Model Parameter Recovery</i>	November 2022
Algebraic Statistics Afternoon Impromptu, Madison, WI <i>Method of Moments</i>	July 2022
Connecting Colorado for Fair Redistricting: A Public Symposium and Call to Action, Zoom <i>Counting and Connecting: The US Census, Mapping, and Why Data Matters</i> Invited Speaker	September 2020
Joint Mathematics Meeting, Denver, CO <i>Measuring Gerrymandering</i>	January 2020
Student Collaborative Research Symposium, Colorado College, CO <i>Measuring Gerrymandering</i> Invited Speaker	September 2019
Mathfest, Cincinnati, OH <i>Measuring Gerrymandering</i> Received a student speaker award from Pi Mu Epsilon.	August 2019
Student Collaborative Research Summer Presentations, Colorado College, CO <i>Techniques for Measuring Gerrymandering</i>	July 2019
MAA Rocky Mountain Sectional Meeting, Durango, CO <i>Emmy Noether and Differential Invariant Theory</i> Joint poster with Sam Kottler, won Honorable Mention	April 2019
Math Club Speaker Series, Colorado College, CO <i>Gödel's Incompleteness Theorem</i>	October 2018

AWARDS AND HONORS

UW - Madison Mathematics Exceptional Service Award	Spring 2024
UW - Madison Early Excellence Teaching Assistant Award	Spring 2022
Colorado College Phi Beta Kappa	2020
Colorado College Barbara Whitten Prize for Women in the Natural Sciences	2020
Colorado College Florian Cajori Award	2020
Colorado College Cajori-Hills-Schneider Scholarship	Fall 2018 - Spring 2020
Colorado College Winona Jewett Finch Scholarship	Fall 2017 - Spring 2020
National Merit Scholarship	Fall 2016 - Spring 2020
Colorado College Dean's List	Fall 2016 - Spring 2019
Colorado College Euclid Scholarship	2018
Pi Mu Epsilon Honor Society Member	2018

LEADERSHIP

Undergraduate Gender Minorities in Math at Wisconsin Organizing committee member	Summer 2023-present
Graduate peer mentor	Summer 2023-present
UW-Madison Undergraduate Mentoring Program Founder and Mentor	Summer 2022-Summer 2023
Colorado College Association for Women in Mathematics Chapter Co-President	Spring 2019-Spring 2020
Colorado College Pi Mu Epsilon Honor Society Chapter President	Spring 2019-Spring 2020
Colorado College Math Club Secretary	Fall 2017-Spring 2018

SERVICE

Panelist and mentor for Graduate Teaching Assistant training University of Wisconsin - Madison	Fall 2023
Invited guest speaker for Badger Precollege on uses of mathematics in social justice University of Wisconsin - Madison	Summer 2023
Career session co-presenter for Expanding Your Horizons Madison University of Wisconsin - Madison	Spring 2023
Student representative for the Graduate Program Committee University of Wisconsin - Madison	Fall 2022 - Spring 2024
Problem writer and grader for the Mega Math Meet University of Wisconsin - Madison	2022, 2023, 2024