Garrett Kepler

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Education

Fall 2022 - present	**Washington State University (WSU)** Ph.D. in Mathematics Research Topic: Spectral Graph Theory	(GPA: 3.55/4.0)
Fall 2023 - present	**WSU** M.S. in Statistics Research Topic: Spectral Partitioning Methods	(GPA: 3.55/4.0)
Spring 2019 - Spring 2022	**Cal State University - East Bay** B.S. in Mathematics with Minor in Physics	(GPA: 3.412/4.0)

Work Experience

Graduate Teaching Assistant August 2022 - present

In WSU's Ph.D. program, I have taught the following mathematics courses through the either as a Teaching Assistant (TA) or Instructor of Record (IOR):

- Math 315 (current): Differential Equations (IOR)
- Math 273: Calculus III (IOR)
- Math 220: Linear Algebra (IOR)
- Math 172: Calculus II (TA)
- Math 171: Calculus I (IOR)
- Math 108: Trigonometry (IOR)
- Math 103 (Accelerated & Regular): Algebra Methods and Introduction to Functions (TA)
- Math 100 (Accelerated): Basic Mathematics (IOR/TA)

Graduate Tutor August 2022 - present

WSU's Math Learning Center offers free tutoring to all currently enrolled students. As a graduate tutor, I am expected to be proficient in every course offered and be able to assist in every topic. Semester weekly assignments have ranged from 4-8 hours per week.

Athletics Tutor August 2023-January 2024

WSU's Athletics Department hosts their own tutoring center specifically for student athletes. I was expected to assist 2-4 students every week with hours ranging from 6-12 hours per week. Topics included both mathematics and statistics.

Research Assistant January 2022-May 2022

Working with Dr. Andrea Arauza Rivera, I was compensated for participating in research around food access in the Bay Area. Using data clustering methods, we found optimal warehouse locations for food programs in several major counties. See publication section below for detailed work.

Research Experiences

Local Limits of Random Graphs (Summer School) Link to Program Website

I attended a summer school in 2025 funded by the NSF through Simon Laufer Mathematical Sciences Institute and the Fondation Mathématique Jacques Hadamard. Defining a specific topology over graphs, we can use probability theoretic techniques to investigate convergence of graph sequences. Most importantly, we can take into account local geometry under this topology. This way we can infer information about the limiting geometry as well as the sequence of graphs that approach the limiting object.

Research on the Mathematics of the Bay Area (RUMBA) Link to Program Website

Founded by Dr. Andrea Arauza Rivera, RUMBA serves as an opportunity for undergraduates to get hands-on experience in data science and mathematics. The projects I was involved in focus on inequality in the Bay Area. Firstly, an assessment of correlation between community factors and standardized test scores. Secondly, an analysis of food access within the counties.

Graduate Collaborations

In my current Ph.D. program, we are encouraged to collaborate within our department and with other departments as well. I currently have an ongoing project with a fellow mathematics graduate students as well as a chemical engineering student. The projects surround Ramsey Theory and applications of machine learning in catalysis respectively. Past projects have been in inverse eigenvalue problems (see below), data science, statistics, and computer science.

High School Project Mentoring

From August 2024 to August 2025, a fellow graduate student and I mentored a proactive high school mathematician in research. Kabir Shah was interested mostly in the applications of graph thoery. We guided him into proving fun theorems and creating a write-up of interesting application areas.

Journal Publications

Kepler, Garrett et al. (Mar. 2023). "Food Deserts and k-Means Clustering". In: *SIURO* 16. URL: https://www.siam.org/publications/siam-journals/siam-undergraduate-research-online-siuro/issues/siuro-volume-16/.

Briscoe, Jarren et al. (May 2025). "Algorithmic Accountability in Small Data: Sample-Size-Induced Bias Within Classification Metrics". In: *AISTATS*. DOI: 10.48550/arXiv.2505.03992.

Unpublished Reports

Brannan, Jared J. L. et al. (Aug. 2024). "Properties of the cone of polynomials of fixed degree that preserve nonnegative matrices". In: URL: https://arxiv.org/abs/2402.04508.

Presentations

- California State East Bay Mathematics Colloquium (2025): "Graph Theory and Gerrymandering: Computationally Assessing Fairness"
- WSU Math 398 entitled Mathematical Snapshots (2025): "Graph Theory Applications: Gerrymandering"
- Joint Mathematics Meeting (2025): "Eigenspaces of Graphs and their Utility"
- WSU Seminar on Theory and Applications of Discrete Math, Linear Algebra, and Number Theory:
  - "A Look into Limits of Random Graphs" (2025)

  - "A Probabilistic Excursion in Spectral Graph Theory" (2025)
  - "Graphical Inginuety: Spectral Solutions to Combinatorial Conondrums" (2024)
  - "Laplace, Fiedler, & Markov: A Graph Reconstruction Problem" (2024)
- Western Canadian Linear Algebra Meeting (2024): "Independent Sets and Graph Energy"