

# Matthew Harrison Hamil

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## SUMMARY

PhD mathematician with experience in data science and statistical modeling alongside peer-reviewed mathematical research. I have built end-to-end modeling pipelines for large-scale datasets, and I am interested in a role where I can apply quantitative skills to real-world problems.

## EDUCATION

### University of Georgia

Doctor of Philosophy, Mathematics

2020-2025

Master of Arts, Mathematics

2019-2020

Bachelor of Science, Mathematics (GPA = 3.69)

2016-2019

## SKILLS AND CERTIFICATIONS

- Programming and Tools: Python (Pandas, NumPy, scikit-learn, Statsmodels), SQL, Jupyter Notebooks, VS Code, Git
- Numerical and Statistical Methods: Regression (Ridge, Lasso), optimization, statistical inference, hypothesis testing, cross-validation, model evaluation (MSE, RMSE)
- Data and Systems: Pipelines, feature engineering, exploratory analysis, reproducible workflows
- Mathematics: Strong background in linear algebra, probability, statistics, multivariable calculus, and representation theory
- Certifications: The Erdős Institute Data Science Boot Camp, Data Science Certificate ([2026](#))

## WORK EXPERIENCE

Johns Hopkins University, *Visiting Assistant Professor*, (Baltimore, MD)

2025-2026

- Leading independent mathematical research projects in the representation theory of Lie algebras with the intent to publish and give conference presentations on results.
- Instructing undergraduate courses in abstract algebra, mathematical logic, and calculus.

The University of Georgia, *Graduate Teaching Assistant*, (Athens, GA)

2020-2025

- Taught five sections of Precalculus, two sections of Calculus I, one section of Calculus II, and an online Calculus I course. Emphasized active learning in small classes (capped at 19 students), designed course materials, wrote and proctored exams, graded assignments, and held office hours.

## PROJECTS

**Predicting Preventable Health Burden from Agricultural Pesticide Exposure - *The Erdős Institute***

2026

- Developed a county-level predictive modeling pipeline linking agricultural pesticide usage data (USGS/EPA) with public health outcomes (CDC PLACES).
- Engineered features including pesticide exposure intensity (normalized by population and cropland) and aggregated risk categories to improve model interpretability.
- Built and evaluated regression models (Ridge, Lasso, XGBoost) using cross-validation; demonstrated statistically significant improvements in predictive performance when incorporating pesticide features.
- Conducted hypothesis testing to quantify model improvements over baseline (e.g., asthma prediction showed significant performance gains with  $p < 0.05$ ).
- Delivered a predictive model, risk map, and stakeholder-oriented insights for insurers, hospital systems, and public health agencies as part of a 5-person team: [Github Repository](#), [Project Presentation](#), [Slide Deck](#)

## RESEARCH AND PUBLICATIONS

- [On localizing subcategories of Lie superalgebra representations](#), PhD Dissertation (2025). Advised by Daniel K. Nakano
- [The homological spectrum and nilpotence theorems for Lie superalgebra representations](#) (with D. Nakano), *Journal of Algebra* (2026).
- [On parabolic Kazhdan–Lusztig polynomials](#), MA Thesis (2019). Advised by Brian Boe and Arik Wilbert