

Claire Plunkett

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Education

Ph.D. in Mathematics – University of Utah, Salt Lake City, UT May 2023

- Topic: Mathematical Biophysics; Advisor: Sean Lawley
- GPA 4.0; NSF Graduate Research Fellowship Program Honorable Mention

B.S. in Applied Mathematics – Case Western Reserve University, Cleveland, OH May 2018

- Minor: Anthropology
- GPA 4.0; Summa cum laude & Phi Beta Kappa

Work Experience

Graduate Intern – Sandia National Laboratories, Albuquerque, NM (Virtual) May 2022 – Present

- Expanded model neural network of dragonfly interception in MATLAB in collaboration with neuroscience bench biologists and neuromorphic computing researchers
- Identified testable hypotheses about coordinate transformations in the dragonfly nervous system
- Developed and tested novel natural language processing (NLP) models using spaCy in Python to identify documents of interest

Mathematics Researcher – University of Utah, Salt Lake City, UT August 2018 – Present

- Modeled biophysical systems using stochastic processes and high-dimensional PDE models
- Validated common model simplifications in molecular dynamics using mathematical analysis
- Designed 7 stochastic simulation methods with optimization to confirm analytic results and estimate parameters in MATLAB, including independent troubleshooting
- Communicated model results through published papers, posters, and talks to a variety of audiences

Data Analyst – VSA Prospecting, Haddon Heights, NJ (Virtual) November 2020 – October 2022

- Developed and enhanced production analysis pipelines using Python and Excel to improve marketing success by identifying targeted areas of focus
- Created interactive data visualization pipelines in Power BI to evaluate campaign success using data-driven analysis

Instructor – University of Utah, Salt Lake City, UT January 2021 – December 2022

- Taught online and in-person courses in Introduction to Quantitative Reasoning, Calculus I, and Vector Calculus & Partial Differential Equations
- Improved students' understanding by breaking down complex concepts into clear components

Data Science Intern – CoNECt Lab, University of Illinois Chicago (Virtual) April – August 2021

- Developed three advanced machine learning models using hidden Markov models via Pyro and PyTorch in Python to analyze multimodal datasets
- Expanded statistical analysis in the BiAffect project using typing dynamics timeseries to analyze mood and cognition by identifying relevant patterns of typing changes

Teaching Assistant – University of Utah, Salt Lake City, UT August 2019 – December 2021

- Designed math laboratory exercises focusing on applications of math concepts to engineering problems and facilitated collaborative problem-solving in 2 classes
- Improved and assessed students' understanding of graduate-level numerical analysis

Leadership & Outreach Experience

President – U of Utah Association for Women in Mathematics, UT June 2021 – May 2022

- Previously Vice President (2020-2021) and Secretary (2019-2020)
- Awarded 2020 AWM Student Chapter Award for Scientific Excellence for speaker series & conference
- Organized virtual events to facilitate networking and collaboration between professors and students
- Created and managed the chapter's first monthly newsletter of relevant opportunities and resources for technical and non-technical members

Co-Organizer – Spectra LGBTQ+ in Mathematics Conference, Virtual February – August 2021

- Organized the first conference for LGBTQ+ mathematicians as the only student on a team of 8
- Shaped the conference to meet the needs of mathematics students through the short- and long-term projects

Selected Publications

- *Modeling Coordinate Transformations in the Dragonfly Nervous System*, C. Plunkett and F. Chance, **NICE '23: Proceedings of the 2023 Annual Neuro-Inspired Computational Elements Conference**, April 2023. <https://doi.org/10.1145/3584954.3584959>
- *Boundary homogenization for patchy surfaces trapping patchy particles*, C. Plunkett and S. Lawley, **The Journal of Chemical Physics**, March 2023. <https://doi.org/10.1063/5.0135048>
- *Bimolecular Binding Rates for Pairs of Spherical Molecules with Small Binding Sites*, C. Plunkett and S. Lawley, **Multiscale Modeling & Simulation**, January 2021. <https://doi.org/10.1137/20M1321991>

Skills

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|-----------------------|----------------------|-------------------|------------------------|
| • Python | • Machine learning | • Data science | • R |
| • Markov models | • Data visualization | • MATLAB | • Communication skills |
| • Simulation modeling | • Collaboration | • Microsoft Excel | • Technical writing |

Courses

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|------------------------|----------------------|---------------------|
| • Stochastic Processes | • Numerical Analysis | • Quantum Computing |
| • Probability | • Dynamical Systems | |