

# Benjamin Brindle

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## Contact Information

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## Research Interests

Time Series Analysis, Stochastic Processes, Clustering Algorithms, Applied Probability, Markov Chains

## Education

Johns Hopkins University, Baltimore, MD

**Ph.D. in Applied Mathematics & Statistics** | May 2026

- GPA: 4.0/4.0
- Advisor: Dr. Daniel Naiman
- Dissertation: *Clustering Irregularly Sampled Time Series Data*

**M.S. in Applied Mathematics & Statistics** | December 2024

- GPA: 4.0/4.0

Lehigh University, Bethlehem, PA

**B.S. in Mathematics** | January 2021

- GPA: 3.96/4.0
- Advisor: Dr. Miranda Teboh-Ewungkem
- Senior Thesis: *A Mathematical Understanding of Red Blood Cell Dynamics*

## Publications

Brindle, B., Hull, T. D., Malgaroli, M., & Charon, N. (2025). VISTA-SSM: Varying and irregular sampling time-series analysis via state-space models. *Psychological Methods*. <https://doi.org/10.1037/met0000785>

## Preprints

Brindle, B., Bonanno, G. A., Hull, T. D., Charon, N., & Malgaroli, M. Language Markers of Emotion Flexibility Predict Depression and Anxiety Treatment Outcomes. <https://doi.org/10.48550/arXiv.2601.07961>

## Presentations

### Conferences

Brindle, B. (2026, January 5). *Clustering Irregularly Sampled Time Series Data* [Talk]. 2026 Joint Mathematics Meetings, Washington, DC.

- Attendance supported by Acheson J. Duncan Fund.

Brindle, B. (2021, June 16). *Bifurcation Analysis in a Mathematical Model for Red Blood Cell Dynamics* [Talk]. 2021 Annual Meeting of the Society for Mathematical Biology, virtual.

Brindle, B. (2021, February 13). *Bifurcation Analysis in a Mathematical Model for Red Blood Cell Dynamics* [Talk]. 35th Annual Moravian College Student Mathematics Conference, virtual.

Brindle, B. (2021, January 8). *Mathematical Understanding of Red Blood Cell Dynamics* [Talk]. 2021 Joint Mathematics Meetings, virtual. <https://meetings.ams.org/math/jmm2021/meetingapp.cgi/Paper/3869>

- Received an Outstanding Poster Presentation Award.

Brindle, B. (2020, November 1). *Mathematical Understanding of Red Blood Cell Dynamics* [Talk]. 12th Annual Undergraduate Research Conference at the Interface of Biology and Mathematics, virtual.

Brindle, B. (2020, February 22). *Mathematical Modeling of Red Blood Cell Dynamics Under Malaria Parasitemia* [Talk]. 34th Annual Moravian College Student Mathematics Conference, Bethlehem, PA, United States.

Brindle, B. (2019, July 23). *The Mathematical Role of Immunity on the Within-Host Malaria Parasite Dynamics* [Poster]. 2019 Annual Meeting of the Society for Mathematical Biology, Montreal, QC, Canada.

- Received a grant (NSF DMS-1815912) used in travel to the conference.

Brindle, B. (2019, February 23). *The Spruce Budworm Model and Its Extensions* [Talk]. 33th Annual Moravian College Student Mathematics Conference, Bethlehem, PA, United States.

## Seminars

Brindle, B. (2025, September 9). *Clustering Irregularly Sampled Time Series Data* [Talk]. 2025 Johns Hopkins University Applied Mathematics & Statistics Student Seminar, Baltimore, MD, United States.

Brindle, B. (2024, April 9). *Time Series Clustering with Mixtures of Linear Gaussian State Space Models* [Talk]. 2024 Johns Hopkins University Applied Mathematics & Statistics Student Seminar, Baltimore, MD, United States.

## Research Experience

### Johns Hopkins University, Baltimore, MD

**Graduate Research Assistant** | Department of Applied Mathematics & Statistics | August 2023 – present

- Write generative Python algorithm to cluster irregularly sampled time series for applications in medicine and industry.
- Collaborate with faculty at three universities and present research findings to colleagues in department student seminar.

### Talkspace, New York, NY (remote)

**Research Analyst Intern** | Network & Clinical Quality | May 2022 – August 2023

- Developed network model with natural language processing of therapy transcripts to study patient diagnosis and recovery.
- Employed deep and convolutional neural networks on big data with Python and solved errors in data pipeline with SQL.
- Created datasets from existing clinical, survey, and transcript sources to streamline analysis process.

### Princeton University, Princeton, NJ (remote)

**Deep Learning Theory Summer School** | July 2021 – August 2021

- Studied current developments in deep learning theory and its applications under supervision of top researchers.

### Lehigh University, Bethlehem, PA

**Undergraduate Research Assistant** | Department of Mathematics | September 2018 – May 2021

- Mathematically modeled red blood cell dynamics using dynamical systems and numerical methods with MATLAB.
- Collaborated with researchers at Los Alamos National Laboratory to study and use data to model malarial dynamics in humans.

## Teaching Experience

Johns Hopkins University, Baltimore, MD

**Instructor** | Department of Applied Mathematics & Statistics

- EN.553.692: Mathematical Biology Spring 2026
  - Deliver lectures, create homeworks, quizzes, and exams for a class of 20 students.
  - Supervise two teaching assistants.
- EN.553.513: Directed Reading in Applied Mathematics Fall 2025
  - Organize Directed Reading program, collaboration between departments of Applied Mathematics & Statistics and Mathematics.
  - Pair 16 undergraduate mentees with nine PhD student mentors to explore advanced topics.
  - Facilitate smooth operations by registering mentees, checking in with mentors and mentees, scheduling final presentations, and assigning final grades.

**Teaching Assistant** | Internship Network in the Mathematical Sciences

- Python, Statistics, and Machine Learning Workshops for PhD Students Fall 2022 – Spring 2025
  - Designed interactive workbooks, fielded students' questions, and debugged code during monthly weekend-long workshops.

**Teaching Assistant** | Department of Applied Mathematics & Statistics

- EN.553.692: Mathematical Biology Spring 2022, Spring 2024, Spring 2025
  - Enhanced students' understanding with detailed solution guides and interactive office hours.
  - Delivered course lectures to class of ten students when invited by instructor.
- EN.553.691: Dynamical Systems Fall 2024, Fall 2025
  - Taught weekly discussion sessions for ten students to reinforce key concepts through examples.
- EN.553.171: Discrete Mathematics Summer 2024
  - Provided daily one-on-one office hours for students in fast-paced summer course.
- EN.553.620: Probability Fall 2021
  - Assigned grading responsibilities to five graduate and undergraduate teaching assistants.

Lehigh University, Bethlehem, PA

**Grader** | Department of Mathematics

- MATH 319: Introduction to Differential Equations Spring 2021
- MATH 301: Principles of Analysis I Fall 2020
- MATH 022: Calculus II Spring 2019, Spring 2020
- MATH 033: Honors Calculus III Fall 2019

**Group Tutor** | Center for Academic Success

- MATH 022: Calculus II Fall 2019 – Spring 2021

**Private Tutor**

- MATH 023: Calculus III Fall 2020
- MATH 022: Calculus II Spring 2019, Spring 2020
- MATH 052: Survey of Calculus II Spring 2019
- MATH 051: Survey of Calculus I Fall 2018
- CHM 030: Introduction to Chemical Principles Fall 2018 – Spring 2019

## Mentorship

Johns Hopkins University, Baltimore, MD

**Directed Reading Program Mentor** | Department of Applied Mathematics & Statistics | Fall 2024 – present

- Created curriculum for two undergraduate students to learn about Kalman filter through project- and presentation-based work.
- Created curriculum for seven undergraduate students to practice probability and statistics questions typically found in technical interviews in group setting.

## Awards

### Johns Hopkins University, Baltimore, MD

**Apprentice Teaching Fellow** | Department of Applied Mathematics & Statistics | Spring 2025

- Awarded for commitment to excellence in instruction.

**Newman Family Fellowship** | Department of Applied Mathematics & Statistics | AY 2022–2023

**National Science Foundation Fellow** | Internship Network in the Mathematical Sciences | Summer 2022

**Gordon Croft Endowed Fellowship** | Whiting School of Engineering | AY 2021–2022

### Lehigh University, Bethlehem, PA

**Thornburgh Mathematics Prize** | Department of Mathematics | May 2021

- Awarded for maintaining an outstanding record in advanced mathematics courses.

**President’s Scholar Award** | Department of Mathematics | January 2021 – August 2021

- Received three semesters’ full tuition for achieving an undergraduate GPA of 3.75+ to pursue a thesis in mathematics.

**Undergraduate Research Grant** | College of Arts and Sciences | April 2019

- Awarded \$750 for the proposal titled “The Relation of Evolving Drug-Resistant Pathogens to Treatment Drugs,” which funded travel to Los Alamos National Laboratory in January 2020.

## Leadership

### Johns Hopkins University, Baltimore, MD

**Department Steward** | Department of Applied Mathematics & Statistics | June 2024 – present

- Streamline communication between university officials and 100+ Ph.D. students, ensuring prompt resolution of concerns.

**Academic Hearing Panel Member** | Whiting School of Engineering | November 2022 – present

- Serve as only graduate student representative on disciplinary panels, reaching fair decisions in cases of academic misconduct.

### Lehigh University, Bethlehem, PA

**President and Secretary** | Latin Dance Club | August 2018 – May 2021

- Managed the planning, promotion, and execution of club activities and choreography.

**Secretary and Treasurer** | East Fifth Records | April 2018 – May 2021

- Assisted in establishing the first student-run record label at Lehigh University.

## Skills

### Programming Languages

- Python (PyTorch, scikit-learn, pandas, NumPy)
- MATLAB
- SQL
- Java
- R

### Tools

- Microsoft Office (Word, Excel, PowerPoint)
- Git
- L<sup>A</sup>T<sub>E</sub>X