Matthew Hudes

Baltimore, MD
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Education

Johns Hopkins Whiting School of Engineering, Baltimore, MD
Ph.D in Applied Math and Statistics, 2028 (expected)
Rubenstein Fellowship, Fall 2023 – Spring 2025

Tufts University, Medford, MA
Bachelor of Science in Applied Mathematics, May 2023
GPA 3.98 / 4.0
The Tufts Norbert Wiener Award in Mathematics, awarded May 2023
Recipient of the Benjamin G. Brown Scholarship, awarded April 2023

Research Experience

Turbulence Research, Dr. Gregory Eyink, Johns Hopkins University June 2024 – Present
- Applying Functional Renormalization Group theory to study Spontaneous Stochasticity

Applied Math Research, Senior Honors Thesis, Dr. Abiy Tasissa, Tufts University January 2022 – May 2023
- Adaptive dictionary learning with inspiration from adaptive resonance theory (ART)

Wealth Inequality Research, Dr. Bruce Boghosian, Tufts University April 2020 – May 2023
- Development of agent-based Monte-Carlo models of the economy in C++ to understand Oligarch creation
- Research for a multi-country COVID-19 model (Summer 2020)

Research Experience for Undergraduates (REU), Professor Mason Porter, UCLA June 2021 – August 2021
- Identifying anomalies in sparsely sampled traffic data with different machine learning techniques

Technical Research Assistant, Office of Institutional Research, Tufts University January 2020 – June 2021
- Enhanced an internal R package and shiny application for generating research reports

High School Senior Project, Dr. David Elbert, Johns Hopkins University Spring 2019
- Built a Graphical User Interface in Python for an object recognition machine learning program

International Student-led Arctic Monitoring and Research Group (ISAMR), The Park School
Data Analyst/Club Leader 2015 - 2019
- Research and monitoring of permafrost active layer thickness and ground cover, analysis with R

Publications and Presentations

- Poster presentation on an FRG Approach to Spontaneous Stochasticity, SIAM conference at Hopkins (April 2025)
- Oral presentation on an FRG Approach to Spontaneous Stochasticity, Hopkins PhD Student Seminar (April 2025)
- Bruce M. Boghosian, **Matthew Hudes**, Gor A. Khachatryan, and Jeremy Marcq. "An economically realistic asset exchange model". In: Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences 380.2224 (2022), p. 20210167. DOI: 10.1098/rsta.2021.0167
- Poster presentation on economic models with Prospect Theory, Joint Math Meetings (April 2022)
- Report and presentation on anomaly detection in sparsely sampled traffic data, UCLA REU (August 2021)
- Presentation on nanotubes in relation to mRNA transfer, Weizmann Institute of Science (August 2019)
- Presentation on Fourier analysis with python, independent study, The Park School of Baltimore (May 2019)
- Poster presentation on the cat gut microbiome, Towson University Summer Symposium (August 2018)

Leadership, Volunteer, and Service

- PhD Student Seminar Co-organizer 2024-2025
  - Johns Hopkins University, Department of Applied Mathematics and Statistics

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- Directed Reading Program (DRP) Mentor
  - Mentee: Jack Drouin. Book: Scaling and Renormalization in Statistical Physics (Cardy) Spring 2025
  - Mentee: Andrew Gilbert. Book: Path Integrals for Stochastic Processes (Wio) Fall 2024

Teaching Assistant

- Spring 2025 – EN.553.681: Numerical Analysis for Gregory Eyink (Johns Hopkins)
- Fall 2024 – EN.553.680: Numerical Linear Algebra for Mario Micheli (Johns Hopkins)
- Fall 2024 – EN.553.691: Dynamical Systems for Yashil Sukurdeep (Johns Hopkins)
- Spring 2024 – EN.553.681: Numerical Analysis for Gregory Eyink (Johns Hopkins)
- Fall 2023 – EN.553.691: Dynamical Systems for Yashil Sukurdeep (Johns Hopkins)
- Fall 2021 – Math 164: Math of Poverty & Inequality for Bruce Boghosian (Tufts)

Technical Skills

Computer: Python, R, C++, Git, Linux, Slurm

Additional Experience

Rock Climbing Department, Ramah in the Rockies, *Instructor and Counselor* Summer 2022/2023
Tufts Mountain Club, Tufts University, *Member and Climbing Director* 2019 - 2023
Jazz Combo, The Park School and Tufts University, *Alto and Baritone Saxophone* 2015 - 2020