Elaine Gorom

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Academic Appointments

Smith College Northampton, MA
Postdoctoral Researcher and Lecturer
Department of Mathematical Sciences *July 2024-Present*

Education

University of North Carolina at Charlotte (UNC Charlotte) Charlotte, NC
Ph.D. - Applied Mathematics *May 2024*
Thesis: *Multiscale Modeling for Crystalline Materials: A Comprehensive Study in Statics and Dynamics*
Advisor: *Xingjie (Helen) Li*

Drake University Des Moines, IA
B.S. - Mathematics *May 2019*
Minor(s):*Physics, Psychology*
Senior Thesis: *Understanding and Application of the Google Matrix*

Research Interests

Numerical Analysis, Computational Solid and Fluid Mechanics, Multiscale Modeling, Mathematical Modeling

Publications

1. A One-Dimensional Symmetric Force-Based Blending Method for Atomistic-to-Continuum Coupling. **Gorom-Alexander, E.**, & Li, X. H. (2023). The 50th John H. Barrett Memorial Lectures-A^3N^2M: Approximation, Applications, and Analysis of Nonlocal, Nonlinear Models.

Preprints

1. Analytical Study on the Dynamics of a Bi-Material System Utilizing Bond-Based Peridynamics. **Gorom-Alexander, E.**, Li, Xingjie Helen. 2024

Presentations

Contributed Talks

1. Quarter Century of Peridynamics, *Peridynamics-to-Peridynamics Bimaterial Modeling.* April 2024.
2. Joint Mathematics Meeting 2024 (JMM), *Analytical Study on the Dynamics of a Bi-Material System Utilizing Bond-Based Peridynamics.* January 2024.
3. 17th US National Congress on Computational Mechanics (USNCCM17), *Nonlocal-to-Local Coupling: A Comprehensive Study in Statics and Dynamics.* July 2023.
4. 2021 SIAM Southeastern Atlantic Sectional Conference, *A One-Dimensional Symmetric Force-Based Blending Method for Atomistic-to-Continuum Coupling.* September 2021.

Invited Talks

1. Rising Stars in Computational and Data Sciences, *Analytical Study on the Dynamics of a Bi-Material System Utilizing Bond-Based Peridynamics.* April 2024.
2. Drake University Conference on Undergraduate Research in the Sciences (DUCURS), *An Empirical Model for Predicting the Decay of Tropical Cyclone Winds after Landfall.* April 2019.

Local Talks

1. October Math Symposium at UNC Charlotte, *A Study of Bi-Material Nonlocal Dynamic Properties.* October 2023.
2. Graduate Student Seminar at UNC Charlotte, *A Comprehensive Study on Multiscale Models in Materials Science.* May 2023.
3. October Math Symposium at UNC Charlotte, *A One-Dimensional Symmetric Force-Based Blending Method for Atomistic-to-Continuum Coupling.* October 2022.

Workshops

Rising Stars in Computational and Data Sciences April 2024-May 2024

Conference or Workshop Organizer

- October Math Symposium at UNC Charlotte. A one-day symposium focused on math research and education. Co-organized event with Xingjie Helen Li. October 2022 and October 2023.

Teaching

Instructor of Record

Smith College

Math 111: Calculus I, Fall 2024

University of North Carolina at Charlotte

Math 1120: Calculus for Non-Technical Fields, Summer I and Summer II 2022

Teaching Adjacent, Tutoring, and Grading Positions

Attendee at College Mathematics Instructor Development Source (CoMInDS) virtual Summer Teaching Seminar 2023
Attendee at UNC Charlotte Fall 2023 Teaching Symposium
Tutor at Math Learning Center at UNC Charlotte for 6 semesters.
Grader for Math 2241: Calculus III at UNC Charlotte, Fall 2019 and Spring 2020
Grader for Math 1165: Introduction to Discrete Mathematics at UNC Charlotte, Spring 2021
Grader for Math 2164: Matrices Linear Algebra at UNC Charlotte, Spring 2024
Teaching Assistant for Math 1241: Calculus I at UNC Charlotte, Summer 2021.
Assistant Center Director (Dec 2023-July 2024), Lead Instructor (June 2018-May 2019), and Instructor (May 2016-June 2018) at Mathnasium, LLC.

Awards & Honors

- **Most Inspiring-2024**. Award from fellow graduate students in the Department of Mathematics & Statistics at UNC Charlotte.
- **Student Marshall at Graduate School Commencement Ceremony-2023**
- **Member of The Honor Society of Phi Kappa Phi-2020-2022**
- **Drake University Science Collaborative Institute Summer Fellowship-2018**. $6000 award to a select number of students to conduct research. Then, was one of three students chosen to present their research at the Drake University Conference on Undergraduate Research in the Sciences

Miscellaneous Research Projects

- Research Assistant with Dr. Shi Chen at UNC Charlotte to create a GUI modeling the SIR/SEIR models for disease for health-care professionals to utilize.
- Summer Fellowship Researcher with Dr. Terrance Pendleton creating empirical models for predicting tropical cyclone wind speeds after landfall.

Leadership Experience

Attendee at *Leading for Impact: A Science-Based Approach* for special sessions *Gender at Work: The Role of Male Leaders as Powerful Allies* and *Meet with Success: Evidence-Based Ways to Create Effective, Engaging, and Inclusive Meetings*. October 2023 and November 2023.
Captain of Drake University Women's Soccer Team. Fall 2017-Fall 2018.
Member of Leadership council for Drake University Women's Soccer Team. Fall 2017-Fall 2018.

Outreach and Volunteering

Data Collector for the Association for Women in Mathematics (AWM) *June 2024*
Volunteered as a data collector for the EvenQuads card deck project.
Graduate Student Ambassador for Department of Mathematics & Statistics *2023-January 2024*
Led tours and hosted meetings for prospective graduate students.
Recruited prospective graduate students at JMM 2024 Graduate School Fair.
Julia Robinson Math Festival volunteer *April 2024*
Led an event on the mathematics of gerrymandering for students.
Heart Math Tutoring volunteer *Sep 2023-Feb 2024*
Tutored elementary students in mathematics skills and problem solving.
Math Motivators volunteer *Aug 2022-Dec 2022*
Tutored high school students in their mathematics course.
Seeds of Success Student-Athlete Mentor *Fall 2016-Spring 2017*

Computational Skills

High-Level Programming Languages: MATLAB, Python
Version Control: Git
Software: LaTeX, GitHub

Industry Work Experience

Prototyping & Software Engineering Intern at The MITRE Corporation May 2020-Sep 2021
Conducted qualitative research utilizing MITRE created tools for data collection and visualization.
Utilized metadata to aid in creation of journey map for Air Force sponsor.
Co-author of White Paper to Air Force sponsor.

Professional Memberships

- American Mathematical Society (AMS)
- Society for Industrial and Applied Mathematics (SIAM)
- Association for Women in Mathematics (AWM)
- US Association for Computational Mechanics (USACM)
- Young Friends of SIAM 2024