Matthew Cassini

NJIT mc225@njit.edu matthewcassini.com matthew-cassini

Education

New Jersey Institute of Technology (NJIT) Expected May 2028
Ph.D. in Applied Mathematics, GPA 3.938
Dissertation Advisor: Thi-Phong Nguyen

New Jersey Institute of Technology (NJIT) May 2023
B.S. in Computational Mathematics

Experience

- **Graduate Teaching Assistant**, Recitation Leader, Department of Mathematical Sciences, NJIT, Fall 2025 – Present
  - Lead recitations for Calculus II and Calculus II Honors
- **Graduate Research Assistant**, Prof. Thi-Phong Nguyen, Department of Mathematical Sciences, NJIT, Spring 2024 – Present
  - Created a numerical solver for the direct scattering problem of Maxwells equations on a biperiodic infinite layer with a local defect contained in one of the periods through the use of Floquet-Bloch transform and a volume integral equation
  - Studying inverse scattering problem
- **Graduate Teaching Assistant**, NJIT, Spring 2024
  - Tutored students on various mathematical subjects and MATLAB programming
- **Undergraduate Research Assistant**, NJIT, May 2022 - May 2023
  - Created a numerical solver for a non-local Monge-Ampére equation utilizing a novel discretisation technique involving the Dirac Delta distribution and monotone finite differences

Publications

- Cassini, M.A., Hamfeldt, B.F. Numerical Optimal Transport from 1D to 2D Using a Non-local Monge-Ampère Equation. La Matematica 3, 509–535 (2024).

Conference and Seminar Presentations

- (Poster) Volume Integral Method for Electromagnetic Equations, Dana Knox Research Showcase, NJIT, April 2025
- (Poster) Volume Integral Method for Electromagnetic Equations, SIAM New York-New Jersey-Pennsylvania Section Conferences (SIAM-NNP), Rochester Institute of Technology (RIT), USA, November 2024
- (Talk) Volume Integral Method for Electromagnetic Equations, HPC Research Symposium, NJIT, July 2024
- (Poster) Optimal Transport Between Unequal Dimensions, Frontiers of Applied and Computational Mathematics (FACM), NJIT, May 2023

Skills

Programming Languages: Highly proficient in MATLAB and Python. Knowledgable in C++, Mathematica and SQL.

Other Softwares: Linux Systems, Git, Slurm Workload Manager, LaTeX

Languages: Proficient in Spanish

Leadership and Service

- UCAN Executive Committee, President, July 2025 – June 2026
  A Union of Student Workers, Researchers, and Adjunct Instructors
  - Lead the executive board and union, hired and trained a staff representative, appointed executive board members, handled grievances and contract enforcement, developed working relationships with university labor relations staff and other union leaders, planned organizing timelines, wrote communications for website, email, and text to members, planned and hosted social events and membership meetings, led

new employee orientations, recruited members, built and trained an organizing committee, delegated tasks to executive board, staff, and other members.

- UCAN Executive Committee, Grad executive board member-at-large, July 2024 – June 2025
  A Union of Student Workers, Researchers, and Adjunct Instructors