

MOYI TIAN

Applied Mathematics, 526 UCB, Boulder, CO, 80309, United States

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🌐 <https://moyi-tian.github.io/moyi-tian>

EDUCATION

Brown University, Providence, RI *September 2019 - May 2024*

Ph.D in Applied Mathematics

Thesis Advisor: Dr. Björn Sandstede, Division of Applied Mathematics

Thesis: Patterns in Network Dynamics

MS, Applied Mathematics

May 2021

Dickinson College, Carlisle, PA *September 2015 - May 2019*

B.S. in Mathematics & Physics

Phi Beta Kappa Honors, Honors in Mathematics, *Summa Cum Laude*

RESEARCH EXPERIENCE

University of Colorado Boulder, Boulder, CO *2024 - Present*

Postdoctoral Associate

PI: Nancy Rodriguez (co-PI: David Bortz)

Learning Dynamics and Detecting Causal Pathways in Coupled Online-Offline Systems

Brown University, Providence, RI *2019 - 2024*

Doctoral Candidate

Advised by Dr. Björn Sandstede, Division of Applied Mathematics

Analyzing localized patterns arising in graph dynamical systems using numerical and analytical techniques

Los Alamos National Laboratory, Los Alamos, NM *September 2023 - November 2023*

Applied Mathematics Graduate Student

Supervised by Dr. Andrey Lokhov, Applied Mathematics and Plasma Physics group

Investigating sample-optimal learning algorithm for temporal networks using graphical model techniques

AMS Mathematics Research Communities *June 2023*

Topic on Complex Social Systems

Collaborative group project led by Dr. Heather Z. Brooks and Dr. Philip S. Chodrow

Developing likelihood-based methods to infer interaction structure in opinion dynamics

Oak Ridge National Laboratory, Oak Ridge, TN *June 2022 - August 2022*

NSF Mathematical Sciences Graduate Internship

Supervised by Dr. Pablo Moriano, Computer Science and Mathematics Division

Studied the robustness of network community structure under addition of edges using data science

Dickinson College, Carlisle, PA *September 2018 - May 2019*

Honors project in mathematics

Advised by Dr. David Richeson, Department of Mathematics & Computer Science

Used various algebraic descriptions of the annular braid group to analyze maypole dancing

Physics senior research

Advised by Dr. Lars Q. English, Department of Physics & Astronomy

Investigated symmetry breaking in coupled logistic maps through experimental realization on electronic circuit

PUBLICATIONS

Published Articles

2023 **M Tian** and P Moriano, *Robustness of community structure under edge addition*, Phys. Rev. E **108** (2023), 054302

- 2021 **M Tian**, JJ Bramburger, and B Sandstede, *Snaking Bifurcations of Localized Patterns on Ring Lattices*, IMA Journal of Applied Mathematics (2021), hxab023
- 2019 H Mhiri, **M Tian**, E Wynne, S Jones, A Mareno, and LQ English, *An Experimental Survey of Chaos and Symmetry Breaking in Coupled and Driven Logistic Maps*, European Journal of Physics **40** (2019), no. 6, 065802

INDUSTRY EXPERIENCE

SAS Institute, Inc, Remote *May 2023 - August 2023 (full-time)*
Machine Learning Graduate Intern *& January 2024 - May 2024 (part-time)*
 Investigated Functional Principal Component Analysis (FPCA) methods and its applications

SELECTED AWARDS, HONORS AND MEMBERSHIPS

Awards

- 2025 **Dynamics Days Travel Awards**, Dynamics Days US 2025
 Travel support to attend Dynamics Days US 2025 conference
- 2024 **SIAM Student Chapter Certificate of Recognition**, Society for Industrial and Applied Mathematics
 In recognition of outstanding efforts and accomplishments on behalf of the SIAM Chapter at Brown University
- 2023 **SIAM Student Travel Awards**, Society for Industrial and Applied Mathematics
 Support students to attend and present at SIAM conferences
- 2019 **James Fowler Rusling Prize**, Dickinson College
 Presented to a member of the senior class whose scholarly achievements have been judged most superior by the All-College Committee on Academic Program and Standards
- The Lance E. Kohlhaas Memorial Prize in Mathematics**, Dickinson College
 Awarded to a graduating mathematics major who has demonstrated excellence in that field and shows promise in an actuarial or mathematics career
- 2018 **The Caroline Hatton Clark Mathematics Scholarship**, Dickinson College
 Awarded for outstanding achievement in mathematics
- 2017 **The Henry P. Cannon Memorial Prize**, Dickinson College
 Awarded to a member of the sophomore class who excels in mathematics
- The Junior Class Sophister Prize**, Dickinson College
 Awarded to the junior with the highest academic ranking at the start of the academic year
- 2016 **The John Patton Memorial Prize**, Dickinson College
 Awarded to a rising sophomore for high scholastic standing

Honors

Phi Beta Kappa Honor Society
 Pi Mu Epsilon National Honorary Mathematics Society
 Sigma Pi Sigma National Physics Honor Society
 Alpha Lambda Delta Honor Society

Memberships

2025 - Present Association for Women in Mathematics

2019 - Present Society for Industrial and Applied Mathematics

2019 - 2024 American Mathematical Society

PRESENTATIONS

Talks

- 2025 **ICERM Workshop on Patterns, Dynamics, and Data in Complex Systems**
Localized Patterns and Modeling Dynamics on Networks, Providence, RI, January, 2025
- 2024 **2024 Joint Mathematics Meetings (JMM 2024)**
Inferring Interaction Kernels for Stochastic Agent-Based Opinion Dynamics, San Francisco, CA, January, 2024
- 2023 **SIAM Conference on Applications of Dynamical Systems (DS23)**
Localized Patterns on Graphs, Portland, OR, May, 2023
- 2022 **SIAM Workshop on Network Science (NS22)** (virtual) - Lightning Talk
How Robust are Communities in Temporal Networks? A Comparative Analysis Using Community Detection Algorithms, September, 2022
- 2022 **Jane Street's Symposium** (virtual)
Localized Patterns on Ring Lattices, January, 2022
- 2021 **Graduate Seminar**
Localized Patterns on Symmetric Coupled Rings - The Influence of Interaction Length on Pattern Formation, Brown University, Providence, RI, December, 2021
- 2021 **Brown / BU / UMass Dynamics & PDE Seminar**
Snaking Bifurcations of Localized Patterns, University of Massachusetts Amherst, Amherst, MA, November, 2021
- 2019 **Mathematics Honors Presentation**
Maypole Braids: An Analysis Using the Annular Braid Group, Dickinson College, Carlisle, PA, April, 2019
- 2019 **Physics Senior Research Talks**
Bifurcation, Symmetry Breaking, and Synchronization in a Coupled-Logistic Map Circuit, Dickinson College, Carlisle, PA, April, 2019

Posters

- 2025 **Dynamics Days US 2025** - Flash Talk & Poster
Localized Patterns on Ring Lattices, Denver, CO, January, 2025
- 2024 **AWM Workshop at SIAM Annual Meeting 2024**
Efficiently Learning Models of Networks, Spokane, WA, July, 2024
- 2024 **2024 Dynamics Days US**
Efficient Learning of Models for Temporal Networks, Davis, CA, January, 2024
- 2023 **Mathematical Opportunities in Digital Twins (MATH-DT) Workshop**
Community Robustness under Edge Addition in Synthetic and Empirical Temporal Networks, George Mason University, Fairfax, VA, January, 2023
- 2023 **Dynamics Days US 2023** (virtual)
Community Robustness in Temporal Networks under Edge Addition, January, 2023
- 2021 **SIAM Conference on Applications of Dynamical Systems (DS21)** (virtual)
Snaking Bifurcations of Localized Patterns on Ring Lattices, May, 2021

- 2019 **34th Annual All Science Symposium**
 1. *Maypole Braids: An Analysis Using the Annular Braid Group*
 2. *Using LabView to Explore Symmetry Breaking in a Coupled Logistic Map Circuit*, Dickinson College, Carlisle, PA, April, 2019
- 2019 **American Physical Society March Meeting 2019**
Using an Arduino in a Coupled Logistic Map Circuit to Explore Basins of Attraction for Symmetry-broken States, Boston, MA, March, 2019

WORKSHOPS AND SUMMER SCHOOLS ATTENDED

- 2025 (Upcoming) IMSI Workshop: UQ and Trustworthy AI Algorithms for Complex Systems and Social Good, Chicago, IL, March 3 - 7, 2025
- 2024 IPAM Workshop IV: Modeling Multi-Scale Collective Intelligences, Los Angeles, CA, November 18 - 22, 2024
- 2023 American Mathematical Society Mathematics Research Communities 2023 on Complex Social Systems, Java Center, NY, June 18 - June 24, 2023
- 2023 Women in Network Science Collabathon, group project on topic modeling, Northeastern University, May 1 - May 5, 2023
- 2022 Fall 2022 Data Science Boot Camp, group project on English language proficiency evaluation model, the Erdős Institute, September - December, 2022 (virtual)
- 2022 OLCF Summer Hands-On High Performance Computing Course, Certificate of Completion, Oak Ridge National Laboratory, July 2022 (virtual)
- 2022 May 2022 Data Science Boot Camp, group project on predicting chocolate ratings with feature engineering, the Erdős Institute, May 9 - June 4, 2022 (virtual)
- 2021 ICERM Workshop: Geometric and Topological Methods in Data Science, Brown University, December 16 - 17, 2021
- 2020 IMSD Module: Introduction to Statistical Analysis of Data 2020, Brown University, November 5, 12 and 19, 2020 (virtual)
- 2020 IMSD Module: Scientific Presentations, Brown University, June 4, 5 and 11, 2020 (virtual)
- 2018 Budapest Semesters in Mathematics Program, completed with honors, Budapest, Hungary, Summer 2018

LEADERSHIP AND SERVICE

Leadership

- Fall 2021 **Brown Division of Applied Mathematics - Directed Reading Program**, Brown University
 Mentored an undergraduate student on mathematical optimal control theory and applications
- Summer 2020 **5-week Undergraduate Program in Experimental Math**, Brown University
 Supervised a team of 3 undergraduate students on studying the dynamics and patterns of graphing fleas
- 2019 - 2020 **Brown Applied Math Undergraduate/Graduate Mentoring Program**
 Mentored an undergraduate student with regards to study plans and academic/career goals

Service

- 2021 - 2023 **APMA Diversity, Equity, and Inclusion Committee**, Brown University
 Attended bi-weekly meetings and developed plans and projects to improve climate and increase diversity and inclusion in the Division of Applied Mathematics
- 2021 - 2023 **Brown SIAM Student Chapter Executive Board**, Brown University
 Kept record for organizational plans and helped facilitate on-campus events
- 2021 - 2023 **Sheridan Center Departmental Graduate Student Liaison**, Brown University
 Maintained communications and forwarded events information between the Sheridan Center for Teaching and Learning and the Division of Applied Mathematics
- 2016 - 2019 **Math & CS Major's Committee**, Dickinson College
 Gave feedback on personnel reviews and provided a student voice in departmental issues

TEACHING

Experience

- Spring 2021 **Applied Ordinary Differential Equations**, Teaching Assistant, Brown University
- Fall 2020 **Operations Research: Deterministic Models**, Teaching Assistant, Brown University
- Fall 2018 **Single Variable Calculus**, Teaching Assistant, Dickinson College
- Fall 2017 **Introduction to Calculus**, Teaching Assistant, Dickinson College
- Fall 2016 **Single Variable Calculus**, Teaching Assistant, Dickinson College

Pedagogical Training

- Fall 2020 **Sheridan Center Certificate I: Reflective Teaching**, Brown University
 Introductory seminar in a cross-disciplinary setting that helps develop and refine fundamental, evidence-based teaching skills and strategies

Tutoring

- 2017 - 2019 **Quantitative Reasoning Center**, Dickinson College
 Tutored college entry-level math, physics and economics students/classes
- 2016 - 2019 **Math Help Room**, Dickinson College
 Tutored walk-in students from college entry-level mathematics classes