MOYI TIAN

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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

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

2019 - Present American Mathematical Society

2019 - Present Society for Industrial and Applied Mathematics

PRESENTATIONS

Talks

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

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

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