

Cameron Thieme

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Education

PhD in Mathematics - University of Minnesota (UMN) | Minneapolis, MN December 2018 - June 2021

- Set-valued and nonsmooth dynamical systems with applications to climate science

MS in Mathematics - University of Minnesota | Minneapolis, MN September 2015 - December 2018

BS in Mathematics - University of Southern California | Los Angeles, CA August 2011 - May 2015

- 2015 Award for Excellence in Mathematics among Seniors
- President and Co-Founder of USC Math Club

Employment

Post-Doctoral Associate - Rutgers University | New Brunswick, NJ September 2021 - June 2023

- Published research on the reliability of long-run predictions made by machine learning models ([article](#))
 - Performed Bayesian analysis to quantify accuracy of insights derived from data-driven dynamics
 - Trained and evaluated ~100K models of ecological systems in parallel on computing cluster
 - Applications in wide range of fields, from cellular biology to robotic control
- Taught probability: stochastic processes, Markov chains, Poisson processes, Brownian motion, Gaussian processes
- Mentored graduate students in dynamics and probability in weekly hour long individual meetings

Mathematics Researcher and Lecturer - University of Minnesota | Minneapolis, MN September 2015 - June 2021

- Conducted research in mathematical foundations of climate science in PhD thesis, leading to two publications ([1](#), [2](#))
- Rigorously identified glaciation events through time series analysis of ice-core data to understand climate fluctuations
- Taught courses relevant to data science: linear algebra and multivariable calculus
 - Managed team of teaching assistants as primary lecturer
- Mentored undergraduates in programs focused on assisting underrepresented students in mathematics

Papers

- Konstantin Mischaikow, Cameron Thieme. "Conditioned Wiener processes as nonlinearities: A rigorous probabilistic analysis of dynamics". *Journal of Computational Dynamics*, 10(3): 371-386, 2023. <https://doi.org/10.3934/jcd.2023004>
- Cameron Thieme. "Isolating neighborhoods and their stability for differential inclusions and Filippov systems." *Topol. Methods Nonlinear Anal.* 59 (1) 53 - 86, 2022. <https://doi.org/10.12775/TMNA.2021.014>
- Cameron Thieme. "Conley index theory and the attractor-repeller decomposition for differential inclusions." *Topol. Methods Nonlinear Anal.* 59 (1) 87 - 111, 2022. <https://doi.org/10.12775/TMNA.2021.018>
- Cameron Thieme. "Conley Index Theory for Multivalued Dynamical Systems and Piecewise-Continuous Differential Equations." [Thesis](#) (Ph.D.) University of Minnesota. 2021. 177 pp. ISBN: 979-8535-58056-2

Technical Skills

- Bayesian surrogate modeling, Gaussian/stochastic processes, and probability theory
- Python: scikit-learn, statsmodels, numpy, scipy, pandas, matplotlib, seaborn, pytorch, etc.
- Parallel and cluster computing
- Software version control via git

- Relational database management via SQL
- Docker

Data Science Programs and Projects

Participant, Math-to-Industry Bootcamp - UMN | Minneapolis, MN June 2021 - July 2021

- Forecasted hydroelectric power generation for Cargill to inform future investment strategies
- Gathered public data and performed time series analysis using SARIMA and other techniques
- Predicted power 12 months in advance with under 4% CV MAPE; presented to Cargill managers

Mentor, Voting Rights Data Institute - MIT and Tufts | Cambridge, MA June 2019 - July 2019

- Led student team to study segregation using topological data analysis in Python
- Studied congressional redistricting using Markov Chain Monte Carlo methods

Participant, Data Science for Finance Course - UMN | Minneapolis, MN January 2018 - May 2018

- Consulted for local restaurant group to predict daily staffing requirements
- Combined private sales data with public sources for regression and classification in Python
- Presented results and recommendations to stakeholders; details restricted by NDA

Participant, Mathematics and Climate Program - University of Kansas | Lawrence, KS January 2018 - May 2018

- Institute for Mathematics and its Applications 2016: Mathematics and Climate
- Time series analysis of ice-core data to provide more consistent definition of deglaciation events

Awards and Fellowships

- Center for Educational Innovation Certificate for Outstanding Teaching 2020
- Ella Thorpe Fellowship 2016-2018
- NSF Graduate Research Fellowship Honorable Mention 2017
- UMN Summer Research Fellowship 2016
- UMN College of Science and Engineering Graduate Fellowship 2015-2016
- USC Award for Excellence in Mathematics among Seniors 2015
- University of Southern California Provost Fellowship 2015

Teaching

- Rutgers University Lecturer
 - Introduction to Stochastic Processes
 - Probability, Markov chains, exponential distribution, Poisson process, Brownian motion
 - Dynamical Models in Biology
- University of Minnesota Lecturer
 - Linear Algebra & Differential Equations, Multivariable Calculus and Calculus I
 - Both online and in-person formats
- University of Minnesota Teaching Assistant
 - Calculus II, Multivariable Calculus, Linear Algebra & Differential Equations, and Sequences, Series, & Foundations
 - Includes teaching MATLAB

Mentorship and Leadership

- Mentoring Undergraduate in Research Project
 - 2019 - present: started after [VRDI 2019](#)
 - Topological data analysis to study segregation
- Counselor for Mathematics Project at Minnesota
 - Annual workshop for undergraduates from underrepresented groups in math
- Mentor for Directed Reading Program
 - Program to build student engagement with mathematics; lead undergraduates in reading advanced undergraduate or beginner graduate mathematics textbooks
 - 2021: Nonlinear Dynamics
 - 2020: Topology/Topological Data Analysis

- University of Southern California Math Club-Founder, Co-President
 - Emphasized bringing women and marginalized students into mathematics
- Volunteer Teacher at Nanogang Junior Secondary School in Gaborone, Botswana

Presentations

- Applied and Computational Mathematics Seminar
 - *Rigorous Probabilistic Analysis of Data-Driven Dynamical Systems* (January 31, 2023)
- Third Symposium on Machine Learning and Dynamical Systems, Fields Institute
 - *Conditioned Weiner Processes as Nonlinearities: A Rigorous Probabilistic Analysis of Dynamics* (September 27, 2022)
- TRIPODS Seminar Series
 - *Attractors of Nonsmooth and Multivalued Dynamical Systems* (October 1, 2021)
- Minnesota Dynamical Systems Seminar
 - *The Continuation of Conley's Attractor-Repeller Pair Decomposition for Differential Inclusions* (March 23, 2021)
- Cornell Dynamics and Climate Summer School 2020
 - *Talk cancelled, COVID*
- Midwest Dynamical Systems Conference 2018
 - *Topological Methods for Climate Models: Filippov Systems and Dispersions* (November 2, 2018)
- Minnesota Mathematics and Climate Seminar
 - *Attractors of Nonsmooth and Multivalued Dynamical Systems with an Application in Oceanography* (February 21, 2023)
 - *Attractor-Repeller Decomposition for Multiflows* (November 10, 2020)
 - *Introduction to Filippov Systems and Multiflows* (September 15, 2020)
 - *Climate and Nonsmooth Dynamics* (October 15, 2019)
 - *Filippov Systems and Multiflows* (February 5, 2019)
 - *The 400,000 Year Problem: Using EEMD to Understand Paleoclimate Data* (February 14, 2017)
 - *Huybers' Identification of Deglaciations* (October 4, 2016)