

DARYL R. DEFORD

Curriculum Vitae

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ACADEMIC APPOINTMENTS

- Washington State University**, Pullman, WA *August 2020 – Present*
Assistant Professor of Data Analytics – Department of Mathematics and Statistics
- Massachusetts Institute of Technology**, Cambridge, MA *June 2018 – July 2020*
Postdoctoral Associate – CSAIL Geometric Data Processing Group
Advisor: Justin Solomon
- Tufts University**, Medford, MA *June 2018 – July 2020*
Visiting Scholar – Jonathan M. Tisch College of Civic Life
Advisor: Moon Duchin

EDUCATION

- Dartmouth College**, Hanover, NH *September 2013 – June 2018*
Ph.D. Mathematics *Awarded June 2018*
Advisor: Dan Rockmore
Dissertation: Matched Products and Dynamical Models for Multiplex Networks
A.M. Mathematics *Awarded November 2014*
- Washington State University**, Pullman, WA *August 2010 – May 2013*
B.S. in Theoretical Mathematics *Awarded May 2013*
Summa Cum Laude

RESEARCH PUBLICATIONS

Accepted Papers

- A26: *Stirling Numbers of Uniform Trees and Related Computational Experiments*, (with A. Barghi), Algorithms, to appear 2023.
- A25: *Maximum a Posteriori Inference of Random Dot Product Graphs via Conic Programming* (with D. Wu and D. Palmer), SIAM Journal on Optimization, 32(4), 2527–2551, 2022.
- A24: *Random Walks and the Universe of Districting Plans* (with M. Duchin), Book Chapter in *Political Geography*, Birkhäuser, 2022.
- A23: *Implementing Partisan Symmetry: Problems and Paradoxes* (with N. Dhamankar, M. Duchin, V. Gupta, M. McPike, G. Schoenbach, K. W. Sim), Political Analysis, 2021.
- A22: *Empirical Sampling of Connected Graph Partitions for Redistricting* (with L. Najt and J. Solomon), Physical Review E, 104(6), 064130, 2021.
- A21: *Partisan Dislocation: A Precinct-Level Measure of Representation and Gerrymandering* (with N. Eubank and J. Rodden), Political Analysis, 1-23, doi:10.1017/pan.2021.13, 2021.
- A20: *Colorado in Context: Congressional Redistricting and Competing Fairness Criteria in Colorado* (with J. Clelland, H. Colgate, B. Malmskog, and F. Sancier-Barbosa), Journal of Computational Social Science, doi:10.1007/s42001-021-00119-7, 2021.
- A19: *ReCombination: A family of Markov chains for redistricting* (with M. Duchin and J. Solomon), Harvard Data Science Review, 3(1), 2021.

- A18: *Medial Axis Isoperimetric Profiles* (with J. Solomon and P. Zhang), Computer Graphics Forum, 39(5), 1-13, 2020.
- A17: *On the Spectrum of Finite, Rooted Homogeneous Trees* (with D. Rockmore), Linear Algebra and its Applications, 598, 165-185, 2020.
- A16: *Competitiveness Measures for Evaluating Districting Plans* (with M. Duchin and J. Solomon), Statistics and Public Policy, 7(1), 69-86, 2020.
- A15: *Mathematics of Nested Districts: The Case of Alaska* (with S. Caldera, M. Duchin, S. Gutenkust, and C. Nix), Statistics and Public Policy, 7(1), 39-51, 2020.
- A14: *Aftermath: The ensemble approach to political redistricting* (with J. Clelland and M. Duchin), MAA Math Horizons, 28(1), 34-35, 2020.
- A13: *Total Variation Isoperimetric Profiles* (with H. Lavenant, Z. Schutzman, and J. Solomon), SIAM J. Appl. Algebra Geometry, 3(4), 585-613, 2019.
- A12: *Spectral Clustering Methods for Multiplex Networks* (with S. Pauls) Physica A: Statistical Mechanics and its Applications, 533, 121949, 2019.
- A11: *Redistricting Reform in Virginia: Districting Criteria in Context* (with M. Duchin), Virginia Policy Review, 12(2), 120-146, 2019.
- A10: *A New Framework for Dynamical Models on Multiplex Networks* (with S. Pauls), Journal of Complex Networks, 6(3), 353-381, 2018.
- A9: *Cyclic Groups with the same Hodge Series*, (with P. Doyle), Revista de la Unión Matemática Argentina, 59(2), 241-254, 2018.
- A8: *Multiplex Dynamics on the World Trade Web*, Proc. 6th International Conference on Complex Networks and Applications, Studies in Computational Intelligence, Springer, 1111-1123, 2018.
- A7: *Random Walk Null Models for Time Series Data*, (with K. Moore), Entropy, 19(11), 615, 2017.
- A6: *Enumerating Tilings of Rectangles By Squares*, Journal of Combinatorics, 6(3), 339-351, 2015.
- A5: *Enumerating Distinct Chessboard Tilings*, Fibonacci Quarterly, 52(5), 102-116, 2014.
- A4: *Pulsated Fibonacci Sequences* (with K. Atanassov and A. Shannon), Fibonacci Quarterly, 52(5), 22-27, 2014.
- A3: *Seating Rearrangements on Arbitrary Graphs*, Involve: A Journal of Mathematics, 7(6), 787-805, 2014.
- A2: *Empirical Analysis of Space-Filling Curves for Scientific Computing Applications* (With A. Kalyanaraman), Proc. 42nd International Conference on Parallel Processing, 170-179, 2013.
- A1: *Counting Rearrangements on Generalized Wheel Graphs*, Fibonacci Quarterly, 51(3), 259-273, 2013.

Preprints

- P7: *Does the first-serving team have a structural advantage in pickleball?*, (with S. Ethier), arXiv:2303.02942, (2023).
- P6: *Multi-Balanced Redistricting*, (with E. Kimsey and R. Zerr), (2022).
- P5: *Labeled Graph Rearrangements on Matched and Star Products*, (with A. Barghi), (2022).
- P4: *Ranking Trees Based on Global Centrality Measures*, (with A. Barghi), (2022).
- P3: *Complexity and Geometry of Sampling Connected Graph Partitions* (with L. Najt and J. Solomon), arXiv: 1908.08881, (2019).
- P2: *Fourier Transforms on $SL_2(\mathbb{Z}/p^n\mathbb{Z})$ and Related Numerical Experiments* (with B. Breen, J. Linehan, and D. Rockmore), arXiv:1710.02687, (2017).
- P1: *A Random Dot Product Model for Weighted Networks* (with D. Rockmore) arXiv: 1611.02530, (2016).

Technical and Expert Reports

- T9: *Amicus Brief of Computational Redistricting Experts* (with. J. Amunson, A. Becker, D. Gold, and S. Hirsch), Merrill vs. Milligan, Supreme Court, 2022.
- T8: *Expert and Rebuttal Reports in Pennsylvania Commonwealth Court*, for Math/Science Petitioners, 2022.

- T7: *Expert and Rebuttal Reports in Wisconsin State Supreme Court*, for Citizen Mathematicians and Scientists, 2021 and 2022.
- T6: *Ensemble Analysis for 2021 Legislative Redistricting in Colorado, First and Second Staff Plans* (with J. Clelland, B. Malmskog, and F. Sancier-Barbosa), Colorado in Context Report, 2021.
- T5: *Ensemble Analysis for 2021 Congressional Redistricting in Colorado* (with J. Clelland, B. Malmskog, and F. Sancier-Barbosa), Colorado in Context Report, 2021.
- T4: *Comparison of Districting Plans for the Virginia House of Delegates* (with M. Duchin and J. Solomon), MGGG Technical Report, 2019.
- T3: *Amicus Brief of Mathematicians, Law Professors, and Students* (with M. Duchin and G. Charles et al.), *Rucho v. Common Cause*, Supreme Court, 2019.
- T2: *Study of Reform Proposals for Chicago City Council* (with M. Duchin et al.), MGGG Technical Report, 2019.
- T1: *An Application of the Permanent-Determinant Method: Computing the Z-Index of Arbitrary Trees*, WSU Department of Mathematics Technical Report Series 2013 #2, 2013.

TEACHING EXPERIENCE

Washington State University

Assistant Professor

Pullman, WA

Fall 2020 - Present

Designed syllabi and daily lectures. Wrote and graded homework, quizzes, and exams. Fully responsible for course content and material.

Math 555 - Topics in Combinatorics: The Probabilistic Method

Spring 2023

Graduate topics course focusing on combinatorial proof techniques and probabilistic methods.

Math 587 - Representation Theory

Fall 2022

Graduate topics course covering representations of finite groups with a particular emphasis on S_n , character theory, and basic Lie representations, with applications to Fourier analysis, spectral graph theory, and random walks.

STAT 536 - Statistical Computing

Fall 2022

Modern computing methods for statistical application and research including generation of random variables, Monte Carlo simulation, bootstrap and jackknife methods, EM algorithm, and Markov chain Monte Carlo methods.

Math 533 - Teaching College Mathematics

Fall 2022

Theory and practice of mathematics instruction at the collegiate level. This course is designed to support TAs in the Department of Mathematics and Statistics. This includes not just pedagogical development but also provides a broader introduction to the various cultures of academia.

Math 448/548 CPT_S 430/530 - Numerical Analysis

Spring 2022

Fundamental course on numerical computation, including: finding zeroes of functions, approximation and interpolation, numerical integration, numerical solution of ordinary differential equations, and numerical linear algebra.

STAT 419 - Introduction to Multivariate Statistics

Fall 2021

Introductory course covering multidimensional data, multivariate normal distribution, principal components, factor analysis, clustering, and discriminant analysis.

Data 115 - Introduction to Data Analytics

Fall 2020, 2021 Spring 2021

Basic techniques and methodology of data science, with an emphasis on data processing and software tools. This course provides a foundation for beginning data analytics majors as well as students from across the university who are looking to develop data and quantitative literacy.

Math 581 - Topics in Math (Computational Methods in Complex Networks)

Fall 2020

Introduction to computational methods and software for analyzing complex systems as well as applications of partition sampling to political redistricting.

Math 599 - Professional Development

Fall 2020, 2021, 2022

This course helps advanced graduate students prepare for the academic and industry job markets, providing advice and feedback about preparing job materials, practice interviews and talks, and other professional preparation.

Metric Geometry and Gerrymandering Group

Cambridge, MA

VRDI Instructor

Summer 2018, 2019

- Organized and led student research groups during an eight week summer program on political redistricting for 80+ graduate and undergraduate students. Met with students daily and both generated and supervised a wide variety of research projects in computational, mathematical, and political topics.

Tufts University

Medford, MA

Co-Instructor

Spring 2019

- Co-taught STS 10: Reading Lab on Mathematical Models in Social Context. This is a reading and discussion based course focused on providing an STS perspective to students who are taking technically-focused modeling classes.

Massachusetts Institute of Technology

Cambridge, MA

IAP Instructor

January 2019

- Developed a four-week course on computational methods for political redistricting. The course incorporated cutting edge mathematical and computational techniques for analyzing gerrymandering.

Dartmouth College

Hanover, NH

Graduate Instructor

September 2015 - May 2018

- Designed syllabi and daily lectures. Wrote and graded homework, quizzes, and exams.

Math 36/QSS 36 - Mathematical Modeling in the Social Sciences

Fall 2017

Data driven course exploring mathematical models and analysis techniques

UNSG 100 - Graduate Ethics Seminar

Fall 2017, 2016, 2015

Seminar on ethical and professional issues in science and mathematics

Math 8 - Calculus of Functions of one and Several Variables

Winter 2017

Second term calculus course covering infinite series, vector functions, and partial derivatives

Math 1 - Calculus with Algebra

Fall 2015

Introductory calculus course with an emphasis on limits and differentiation

Teaching Assistant

September 2013 - June 2015

- Held tutorial sessions three times per week. Graded quizzes and exams.

Math 23 - Differential Equations

Spring 2015

Math 22 - Linear Algebra with Applications

Fall 2014

Math 3 - Calculus

Winter 2014

Math 12 - Calculus Plus

Fall 2013

Washington State University

Pullman, WA

Undergraduate Teaching Assistant

August 2012 - May 2013

- Held tutorial sessions and graded homework and exams. Supervised a mathematical computing lab.

Math 320 - Modern Algebra

Spring 2013

Math 330 - Secondary Teaching

Spring 2013

Math 315 - Differential Equations

Fall 2012

RESEARCH STUDENTS

PhD Advisor

- Md. Mahedi Hasan (WSU Statistics 2022 -)
 - Topic: Change point detection in RDPG models
- Weiwei Xie (Coadvised with Dean Johnson WSU Statistics 2022 -)
 - Topic: Ordinal Pattern Analysis for Time Series
- Patrick Gambill (WSU Mathematics 2022 -)
 - Topic: Clustering Metrics for Multiplex Networks
- Phousawanh Peaungvongpakdy (WSU Mathematics 2022 -)
 - Topic: Mathematical and Computational Democracy

PhD Committee Member

- Jingyang Wang (WSU Math 2023-)
- Nathaniel Parks (WSU Math 2023-)
- Yanan Tang (WSU Statistics 2022-)
- Ben Hellwig (WSU Math 2022-)
- Wiriyaorn Laaied (WSU Statistics 2022-)
- Swarnita Chakborthy (WSU Statistics 2021-2023)
- Katrina Sabochick (WSU Math 2021-2023)
- Faizah Alanazi (WSU Math 2021)

MS Project Supervisor

- Anastasia Vishnevskaya (WSU MS Statistics 2021-2022)
 - Project: Exploring China's Twiplomacy: Social Network and Sentiment Analysis of the 'Chinese Embassy in the US' Twitter Account
- James Asare (WSU MS Applied Math 2020-2021)
 - Project: Analysis of Optimized Plans for School Redistricting

BS Project Supervisor

- Kallie Distler (WSU Psychology 2022-2023)
 - Project: Null Models for Social Network Analysis of Elementary School Students
- Eric Johnson (WSU Math 2022-2023)
 - Project: Dynamics of Voting Networks: Implications for Fairness, Representation, and Accountability
- Zhiyaun (Freeman) Chen (WSU Data Analytics 2022)
 - Project: Spatial Influences on Vote Modeling in Washington State
- Elliot Kimsey (WSU Data Analytics 2021-2022)
 - Project: Analysis of Malapportionment on Washington State Dual Graphs

- Karthik Ayyalasomayajula (WSU Data Analytics 2022)
 - Project: Geo-Spatial Analysis of Ranked Choice Voting in Maine Congressional Elections
- Rishabh Chandra (MIT EECS UROP 2019-2020)
 - Project: Reinforcement Learning for Graph Partitions

High School Project Supervisor

- Harrison Roth (Paul D. Schreiber Senior High School Math Research Program 2022-2023)
 - Project: Gerrymandering: Properties of Nested Districts with Application to Illinois
- Brian Pae (Collegiate School Science and Engineering Research Program 2022-2023)
 - Project: Computational Redistricting Analysis of Incumbency in New York

EDUCATIONAL OUTREACH

AMS Engaged Pedagogy Series

Instructor

Zoom

Spring 2021

- Designed and presented interactive course materials on gerrymandering and computational redistricting for instructors across the country together with other experts in the Mathematical Foundations for Democratic Processes program.

CISER Workshop on Python for Social Network Analysis

Instructor

Pullman, WA

March 2023

- Designed and presented interactive course materials on network science and the networkx package in Python. The interdisciplinary approach attracted students from eleven different departments around the WSU campus.

UW Data Science for Social Good

Project Lead

Seattle, WA

Summer 2021

- Designed and supervised a research project for four data science fellows on applications of ensemble methods to initial districting plan evaluation. The fellows gave a public presentation of their work and developed a user guide “Applying GerryChain: A Users Guide for Redistricting Problems” with accompanying website, case studies, and code examples to demonstrate good modeling practices and support other researchers working on these problems.

New Hampshire State Math Team

Math Team Coach

Manchester, NH

Fall 2018–2020

- Designed practice problems and preparatory exercises for the AMC exams, ARML, MMATH, and HMMT. Led monthly problem solving sessions and group activities.

L^AT_EX Workshops

Organizer

Hanover, NH

Fall 2016–May 2018

- Designed and presented a series of eleven one hour–long and two three hour–long workshops on mathematical typesetting in L^AT_EX with D. Freund and K. Harding.

Crossroads Academy Math Team

Math Team Coach

Lyme, NH

September 2015 – May 2018

- Designed practice problems and preparatory exercises for the AMC exams, MathCounts, and MathLeague. Led weekly problem solving sessions and group activities. During 2015–17, the Crossroads team twice won the Chapter and State MathCounts and MathLeague competitions and placed first in Northern New England on the AMC-8.

New Hampshire State MathCounts Team*Math Team Coach*

Lyme, NH

March 2017 – May 2017

- Designed practice problems and preparatory exercises for the national MathCounts exam. Led bi-weekly problem solving sessions and group activities. Students competed in the national competition in Orlando, Florida.

Johns Hopkins Center for Talented Youth Science and Technology Series

Hanover, NH

Workshop Leader

- Developed and presented hour-long workshops for high school students.

Binary and Barcodes (with D. Freund)

April 2017

Forensic Accounting

April 2016

Modern Cryptography (with D. Freund)

*October 2014***Dartmouth College Exploring Mathematics Camp**

Hanover, NH

Co-Instructor

- Organized and presented week long math camps for high school students.

Mathematics of Games

August 2015

Cryptography

*July 2015***RESEARCH PRESENTATIONS**

Talks

1. Fu Lab Seminar, Dartmouth College, Hanover, NH *February 2023*
Case Studies in Computational Redistricting
2. Joint Mathematics Meetings, Boston, MA *January 2023*
An Invitation to Computational Redistricting
3. University of Montana Math Colloquium, Missoula, MT *September 2022*
Graphs, Geometry, and Gerrymandering
4. Stanford and RDH Redistricting and Data Convening, Palo Alto, CA *September 2022*
Panelist: How to improve redistricting data sourcing & quality
5. MGGG Redistricting Lab, Medford, MA *August 2022*
Sampling Complexity and ‘Practical’ Inference on Network Models
6. Permutation Patterns, Valparaiso, IN *June 2022*
Enumerating Orderings on Matched Product Graphs
7. WSU Common Read Program, Pullman, WA *April 2022*
Algorithmic Bias and Modern Inequalities
8. PiMUC Plenary Talk, Pullman WA *April 2022*
Political Geographies: Graphs, Geometry, and Gerrymandering
9. SIAM Minisymposium “Mathematics of Complex Systems” JMM 2022, Seattle, WA *April 2022*
Initial Districting Design with Markov Chain Ensembles
10. Mathematics plus Democracy Seminar, NYU, New York, NY *March 2022*
Partisan Dislocation, Competitiveness, and Designing Ensembles for Redistricting Analysis
11. Fu Lab Seminar, Dartmouth College, Hanover, NH *February 2022*
Partisan Dislocation, Competitiveness, and Designing Ensembles for Redistricting Analysis
12. D4 Seminar PNNL–WSU, Pullman, WA *February 2022*
Sampling Complexity and ‘Practical’ Inference on Network Models
13. ADSA Annual Conference, Zoom *February 2022*
Democratizing Districting
14. Carter et al. v. Chapman et al. PA Commonwealth Court, Harrisburg, PA *January 2022*
Expert testimony for Gressman Math and Science Petitioners

15. Analysis Seminar, Pullman, WA *December 2021*
Introduction to Graphons I and II
16. PPPA Research Colloquium, Pullman, WA *November 2021*
Computational Methods for Evaluating Districting Plans
17. INFORMS Annual Meeting, Zoom *October 2021*
Algorithms And Analysis For Centered Redistricting Plans
18. WSU Math Club, Pullman, WA *October 2021*
Graphs, Geometry, and Gerrymandering
19. Civic Hackathon, Madison, WI *September 2021*
Introduction to Computational Redistricting
20. Harvard Redistricting Algorithms, Law, and Policy Cambridge, MA *September 2021*
Technical State of the Art for Computational Redistricting
21. ASA Joint Statistical Meeting, Zoom *August 2021*
Computational Methods for Assessing Political Redistricting Reforms
22. New Mexico Redistricting Commission, Santa Fe, NM *July 2021*
Markov chain ensemble metrics for evaluation of redistricting plans
23. Colorado College Summer Program, Colorado Springs, CO *June 2021*
Computational Redistricting Analysis
24. WSU Seminar in Statistics, Pullman, WA *April 2021*
Ensemble Analysis for the 2020 Redistricting Cycle
25. Princeton Gerrymandering Project, Princeton, NJ *March 2021*
Computational Redistricting in 2021
26. Combinatorics, Linear Algebra, and Number Theory, WSU, Pullman, WA *March 2021*
Gerry-Matchings and Pair-y-Mandering
27. JMM 2021, Washington DC *January 2021*
Short Course: Mathematical and Computational Methods for Complex Social Systems
28. INFORMS Special Session on Fairness in Operations Research, Baltimore, MD *November 2020*
Computational Methods For Assessing Districting Plans
29. WSU Seminar in Statistics, Pullman, WA *November 2020*
Statistical and Computational Methods for Assessing Political Redistricting
30. Pi MU Epsilon Lecture, St. Michael's College, Colchester, VT *October 2020*
Graphs, Geometry, and Gerrymandering
31. ADSA Annual Meeting, Zoom *October 2020*
Geospatial Data for Political Redistricting Analysis
32. Common Experience Lecture, Texas State University, San Marcos, TX *October 2020*
Graphs, Geometry, and Gerrymandering
33. Combinatorics, Linear Algebra, and Number Theory, WSU, Pullman, WA *September 2020*
Representations of $SL_2(\mathbb{Z}/p^n\mathbb{Z})$ and spectral properties of Bethe trees
34. CGAD-GTOpt Seminar, Washington State University, Pullman, WA, *July 2020*
Geometric and Optimization Problems Motivated by Political Redistricting
35. Redistricting Conference 2020, Duke University, Durham, NC, *March 2020*
Multiresolution Redistricting Algorithms
36. Math Department Colloquium, College of Charleston, Charleston, SC. *February 2020*
Geospatial Data, Markov Chains, and Political Redistricting
37. Math Department Colloquium, Washington State University, Pullman, WA. *January 2020*
Geospatial Data, Markov Chains, and Political Redistricting
38. JMM 2020, Denver, CO. *January 2020*
Markov chains for sampling connected graph partitions
39. Math Department Colloquium, Pacific University, Forest Grove, OR. *January 2020*
The Mathematics of Nested Legislative Districts
40. MIT Graphics Annual Retreat, North Falmouth, MA. *October 2019*
Connected Graph Partitions and Political Districting

41. Topology, Geometry and Data Seminar, Ohio State University, Columbus, OH. *September 2019*
Hardness results for sampling connected graph partitions with applications to redistricting
42. Math Department Colloquium, Denison University, Granville, OH. *September 2019*
Graphs, Geometry, and Gerrymandering
43. Math Department Colloquium, Oberlin College, Oberlin, OH. *September 2019*
Graphs, Geometry, and Gerrymandering
44. Math Department Colloquium, College of Wooster, Wooster, OH. *September 2019*
Graphs, Geometry, and Gerrymandering
45. Math Monday Colloquium, Kenyon College, Gambier, OH. *September 2019*
Graphs, Geometry, and Gerrymandering
46. Applied Math Seminar, University of Massachusetts Lowell, Lowell, MA. *September 2019*
Hardness results for sampling connected graph partitions with applications to redistricting
47. Math Department Colloquium, Yale University, New Haven, CT. *August 2019*
Mathematical Challenges in Neutral Redistricting
48. Voting Rights Data Institute Seminar, Cambridge, MA. *June 2019*
A Friendly Introduction to Discrete MCMC
49. Voting Rights Data Institute Seminar, Cambridge, MA. *June 2019*
Graphs and Networks: Discrete Approaches to Redistricting
50. Math Department Colloquium, Dartmouth College, Hanover, NH. *April 2019*
Total Variation Isoperimetric Profiles and Political Redistricting
51. ACM Seminar, Dartmouth College, Hanover, NH. *April 2019*
Hardness results for sampling connected graph partitions with applications to redistricting
52. Unrig Summit Masterclass, Nashville, TN. *March 2019*
Legal and Math Deep Dive: Gerrymandering and Redistricting
53. MIT Graphics Seminar, Cambridge, MA. *March 2019*
Computational Challenges in Neutral Redistricting
54. JMM 2019, Baltimore, MD. *January 2019*
Matched Products and Stirling Numbers of Graphs
55. Societal Concerns in Algorithm and Data Analysis, Weizmann Institute of Science, Rehovot, Israel. *December 2018*
Computational Problems in Neutral Redistricting
56. Math and Law of Redistricting, Radcliffe Institute, Cambridge, MA. *December 2018*
GerryChain and MCMC tutorials
57. Math Colloquium, Tufts University, Medford, MA. *November 2018*
Matched Products and Stirling Numbers of Graphs
58. MIT Graphics Annual Retreat, Dedham, MA. *October 2018*
Mathematical Challenges in Neutral Redistricting
59. SAMSI Workshop on Quantitative Redistricting, Duke University, Durham, NC. *October 2018*
Compactness Profiles and Reversible Sampling Methods for Plane and Graph Partitions
60. Election Teach-in, SMFA, Boston, MA. *October 2018*
Computational Challenges in Political Redistricting
61. STS Seminar, Tufts University, Cambridge, MA. *September 2018*
Mathematical Modeling of Social Connections
62. Voting Rights Data Institute Seminar, Cambridge, MA. *June 2018*
Introduction to Monte Carlo Methods
63. Mathematics Colloquium, University of Central Florida, Orlando, FL. *February 2018*
Dynamical Models for Multiplex Data
64. Mathematics Colloquium GVSU, Grand Valley, MI. *February 2018*
Random Walk Null Models for Time Series
65. Omidyar Fellowship Presentation, Santa Fe, NM. *January 2018*
Mathematical Embeddings of Complex Systems
66. Mathematics Colloquium at University of San Francisco, San Francisco, CA. *January 2018*
Dynamical Models for Multiplex Data

67. Mathematics Colloquium at Providence College, Providence, RI. *January 2018*
Dynamical Models for Multiplex Data
68. JMM, San Diego, CA. *January 2018*
Dynamical Modeling for Multiplex Networks
69. International Complex Networks Conference Lyon, France. *December 2017*
Multiplex Dynamics on the World Trade Web
70. Physics Colloquium at Washington University, St. Louis, MO. *October 2017*
Spectral Clustering on Multiplex Data
71. SIAM Annual Meeting, Pittsburgh, PA. *July 2017*
Permutation Complexity Measures for Time Series
72. Applied and Computational Mathematics Seminar, Hanover NH. *November 2016*
Random Dot Product Models for Weighted Networks
73. Inference on Networks: Algorithms, Phase Transitions, New Models and New Data, Santa Fe, NM. *December 2015*
Dynamically Motivated Models for Multiplex Networks
74. Applied Math Days, Troy, NY. *April 2015*
Multiplex Structure on the World Trade Web
75. Graduate Student Combinatorics Conference, Lexington, KY. *March 2015*
Total Dynamics on Multiplex Networks
76. Sixteenth International Fibonacci Conference, Rochester, NY. *July 2014*
Enumerating Distinct Chessboard Tilings
77. Dartmouth Graduate Student Seminar, Hanover, NH. *(Quarterly) 2013 - 2018*
Various Topics
78. Joint Mathematics Meeting, San Diego, CA. *January 2013*
Counting Combinatorial Rearrangements, Tilings with Squares and Symmetric Tilings
79. West Coast Number Theory Conference, Asilomar, CA. *December 2012*
Generalized Lucas Bases
80. Young Mathematician's Conference, Columbus, OH. *July 2012*
Combinatorial Rearrangements on Arbitrary Graphs
81. Northwest Undergraduate Mathematics Symposium, Portland, OR. *March 2012*
Combinatorial Rearrangements on Arbitrary Graphs
82. WSU Graduate Seminar on Combinatorial Geometry, Pullman, WA. *(Quarterly) 2012-2013*
Various Topics

Posters

1. SIAM Workshop on Network Science, Boston, MA. *July 2016*
Generalized Random Dot Product Models For Multigraphs
2. Dartmouth Graduate Student Poster Session, Hanover, NH. *April 2016*
Generalized Dot Product Models for Weighted Networks
3. Dartmouth Graduate Student Poster Session, Hanover, NH. *April 2015*
Multiplex Structures in the World Trade Web
4. WSU SURCA, Pullman, WA. *March 2013*
Empirical Analysis of Space Filling Curves for Scientific Computing Applications
5. WSU SURCA, Pullman, WA. *April 2012*
Combinatorial Rearrangements, Restricted Permutations, and Matrix Permanents

HONORS AND AWARDS

- WSU CAS Early Career Achievement Award for Tenure Track Faculty *2023*
College-wide award for outstanding accomplishments in research early in their professional career
- Dartmouth Hannah Croasdale Award *2018*
College-wide award for the graduating Ph.D. student that best exemplifies the qualities of a scholar.
- Dartmouth Graduate Student Teaching Award *2017*
College-wide award for the graduate student who best exemplifies the qualities of a college educator.

- Dartmouth Graduate Fellowship *2014–18*
- NSF Graduate Research Fellowship: Honorable Mention *2014, 2015*
- Dartmouth GAANN Fellowship *2013*
- WSU Morris Knebelman Outstanding Senior Award *2013*
- WSU Department of Mathematics Outstanding Senior *2013*
- WSU Emeritus Society Award in the Physical Sciences *2013*
- WSU J. Russell and Mildred H. Vatnsdal Memorial Scholarship *2012*
- WSU SURCA Crimson Award: Computer Science and Mathematics *2012, 2013*
- WSU Auvil Undergraduate Scholars Fellowship *2012*
- WSU Leonard B. Kirschner Scholarship *2012*
- WSU College of Sciences Undergraduate Research Grant *2012*
- Norma C. Fuentes and Gary M Kirk Award for Excellence in Undergraduate Research *2012*

PROFESSIONAL SERVICE

WSU Departmental Service

- Statistics TT Hiring Committee *2022 - 2023*
- STEM Student Engagement Research and Mentoring Program *2022 -*
- Data Analytics Faculty Advisory Board *2022 -*
- Math Club Faculty Advisor *2021 -*
- Core to Career Faculty Fellow (DATA 115) *2021-2022*
- Data Analytics Curriculum Committee *2020 -*

Peer Reviewer

- IISE Annual Conference
- AMS American Mathematical Monthly
- Nature Scientific Data
- Operations Research Forum
- Journal of Computational Social Science
- INFORMS Journal on Applied Analytics
- Proceedings of the National Academy of Sciences (PNAS)
- Algebra Colloquium
- Computers & Graphics
- Election Law Journal
- Transactions on Signal and Information Processing over Networks
- Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal
- International Conference on Learning Representations (ICLR)
- International Conference on Artificial Intelligence and Statistics (AISTATS)
- AAAI Conference on Artificial Intelligence (AAAI)
- International Conference on Machine Learning (ICML)
- ACM-SIAM Symposium on Discrete Algorithms (SODA)
- Neural Information Processing Systems (NeurIPS)
- Transactions on Pattern Analysis and Machine Intelligence (TPAMI)
- Chaos: An Interdisciplinary Journal of Nonlinear Science
- Involve: A Journal of Mathematics
- Entropy
- MATCH Communications in Mathematical and in Computer Chemistry

PROFESSIONAL MEMBERSHIPS

- Institute for Mathematics and Democracy *invited April 2022*
- Society for Industrial and Applied Mathematics (SIAM) *joined June 2016*
- American Mathematical Society (AMS) *joined April 2012*