ELIZABETH MUNCH

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Dept of Computational Mathematics, Science, and Engineering ⋄ Dept of Mathematics

Michigan State University ⋄ East Lansing, MI

EDUCATION

Duke University, *Durham, NC*
Ph.D. Dept. of Mathematics   May 2013
  · Thesis: Applications of Persistent Homology to Time Varying Systems
M.A. Dept. of Mathematics   Dec 2010

University of Rochester, *Rochester, NY*
B.S. Mathematics, Summa Cum Laude, School of Arts and Sciences   May 2008
B.M. Harp Performance with High Distinction, Eastman School of Music   May 2008

RESEARCH EXPERIENCE

Michigan State University, *East Lansing, MI*
Dept. of Computational Mathematics, Science and Engineering (CMSE)
Dept. of Mathematics
Associate Professor   July 2022 – Present
Assistant Professor   Aug 2017 – July 2022

University at Albany – SUNY, *Albany, NY*
Dept. of Mathematics & Statistics
Assistant Professor   Sept 2014 – July 2017
Dept. of Computer Science
Affiliated Faculty   July 2015 – July 2017

University of Minnesota, *Minneapolis, MN*
Institute for Mathematics and Its Applications
Postdoctoral Fellow   Sept 2013 – Aug 2014

Duke University, *Durham, NC*
Dept. of Mathematics
Visiting Assistant Professor   June 2013 – Aug 2013
Graduate Research Assistant   Sept 2008 – May 2013

AWARDS AND HONORS

NSF CAREER Award, 2022
Jo Rae Wright Fellowship for Outstanding Women in Science, Duke University, 2012-2013
Phi Beta Kappa, University of Rochester, May 2008
Performer's Certificate in Harp, May 2008
Lois S. Rogers Scholarship, Eastman School of Music, 2004-2008
Performer's Certificate, Eastman School of Music, 2008
Presser Scholarship, Eastman School of Music, 2007

PUBLICATIONS

Due to working in an interdisciplinary setting, my work follows many different conventions for authorship. Theoretical mathematics and theoretical computer science tend to be published alphabetically. Applied mathematics and other domain settings tend to be published in descending order of contribution, with graduate students and postdocs listed first; followed by PIs.

Preprints

Journal Articles

Whenever possible, I post preprints of my papers to the arXiv. Where available, I include links to both the publised versions (via DOI or URL), as well as to the arXiv posting.

Computer Science Conference Proceedings

My work is interdisciplinary and often crosses between mathematics and theoretical computer science. In CS, both journals and selective proceedings are highly regarded venues for publications. The proceedings have the advantage of high visibility and a shortened time to press. These venues are peer-reviewed by a general minimum of between 3 and 5 evaluators and can be highly competitive. Acceptance rates are provided when known. Most notable conferences in my work are the Symposium on Computational Geometry (SoCG), *which is the top conference in Applied Topology and Geometry [***Chambers2020***,* **Munch2016***,* **Bauer2015b***]; and IEEE Scientific Visualization (SciVis) published in the journal TVCG, which is the top conference in visualization [***Yan2019a***].*

Other Conference Proceedings

This section includes conference papers either from non-computer science conferences, or from papers submitted to workshops where the paper is not part of the main session.

Book Chapters

Published Datasets

Other Published Work

GRANTS: FUNDED AND RECOMMENDED FOR FUNDING

Collaborative Research: AF: Medium: A Unified Framework for Geometric and Topological Signature-Based Shape Comparison
- NSF CCF-2106578: $409,945
- Jun 2021 - May 2025
- Role: Principal Investigator
- Collaborative with Erin Chambers, Computer Science, St. Louis University; Carola Wenk, Computer Science, Tulane University

AF: Small: Collaborative Research: Reeb graph flows: Metrics, Drawings, and Analysis
- NSF CCF-1907591: $246,596
- Oct 2019 - Sept 2022
- Role: Principal Investigator
- Collaborative with Erin Chambers, (PI: CCF-1907612) Computer Science, St. Louis University

Role of transport processes in formation of optimal microbial habitats and the root-microbe-soil carbon accrual continuum
- NSF DEB-1904267: $624,995
- Sept 2019 - Aug 2024
- Role: Co-PI
- Collaborative with
  - Alexandra Kravchenko (PI), Dept of Plant, Soil, and Microbial Sciences, MSU
  - Daniel Chitwood (Co-PI), Depts of Horticulture and CMSE, MSU

– Lisa Tiemann (Co-PI), Dept of Plant, Soil, and Microbial Sciences, MSU
– Andrey Guber (Co-PI), Dept of Plant, Soil, and Microbial Sciences, MSU

Zigzag Persistent Homology and Network Methods for Topological Signal Processing
- Air Force Office of Scientific Research, $375,000
- Oct 2021 - Sep 2024
- Role: Co-PI
- Collaborative with Firas Khasawneh (PI), Mechanical Engineering, MSU

CAREER: Reeb graph learning: Classification, Clustering, and Embedding of Graphical Signatures
- NSF CCF-2142713: $507,462
- May 2022 - May 2027
- Role: PI

GRANTS: COMPLETED PROJECTS

Collaborative Research: A Unified Framework for the Investigation of Time Series Using Topological Data Analysis
- NSF CMMI-1562012/1800466: (UAlbany/MSU) $178,736 *
- April 2016 - Mar 2020
- Role: Principal Investigator
- Collaborative with Firas Khasawneh, (PI: CMMI-1562459/1759823) Mechanical Eng., MSU

CDS&E: Collaborative Research: Machine Learning on Dynamical Systems via Topological Features
- NSF DMS-1622320/1800446: (UAlbany/MSU) $101,672
- Sept 2016 - Aug 2019
- Role: Principal Investigator
- Collaborative with
    – Firas Khasawneh, (PI: DMS-1622293/1759824) Mechanical Eng., MSU
    – José Perea, (PI: DMS-1622301) Depts. of Math, & CMSE, MSU

Kaleidoscope: Turning System Design Inside-Out
- DARPA
- Aug 2016-July 2017
- Role: Technical POC
- Collaborative with Raytheon BBN Technologies Corp., Boston, MA

INVITED SPEAKER

Talk titles with hyperlinks have recordings or supplementary material available.

1. *Crafting Topological Features.* BIRS Deep Exploration of non-Euclidean Data with Geometric and Topological Representation Learning, Kelowna, BC, Canada, July 12, 2022.

2. *The many faces of the interleaving distance.* Plenary talk, ATMCS 10, Oxford, UK, June 23, 2022.

3. *Making space and studying shape in a non-traditional academic setting.* Keynote Address, WiDS Iowa, Virtual, Apr 21, 2022.

4. *The Interleaving Distance for Reeb Graphs.* Math Dept Colloquium, University of Utah, Salt Lake City, UT, Apr 7, 2022.

5. *The Shape of Data.* Keynote Address, NAPPN Annual Conference, University of Georgia, Athens, GA, Twosday, Feb 22, 2022.

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*Double grant numbers caused by transfer of grants to MSU.

6. *Combining network analysis and persistent homology for classifying behavior of time series.* Dynamics Days, Online due to COVID-19, Jan 7, 2022.

7. *The Truncated Interleaving Distance for Reeb Graphs.* Quivers Seminar, University of Iowa, Online due to COVID-19, November 15, 2021.

8. *On the inter-level-set persistence bottleneck distance for Reeb graphs.* Computational Persistence Workshop, Purdue, Online due to COVID-19, November 5, 2021.

9. *The Truncated Interleaving Distance for Reeb Graphs.* SIAM Conference on Applied Algebraic Geometry, Online due to COVID-19, August 18, 2021.

10. *The Interleaving Distance for Graphical Signatures.* Mathematical Congress of the Americas, Online due to COVID-19, July 16, 2021.

11. *Measuring the Shape of Hurricanes.* MSU SURIEM REU, Online due to COVID-19, July 7, 2021.

12. *Metrics for Graphical Signatures.* Topological Ideas in Applications, Thematic Einstein Semester on Geometric and Topological Structure of Materials, TU Berlin, Online due to COVID-19, June 24, 2021.

13. *The Directional Transform: From Theory to Practice.* Workshop on Computational Topology at SoCG, Gather town, June 10, 2021.

14. *A family of metrics from the truncated smoothing of Reeb graphs.* Symposium on Computational Geometry (SoCG) Main Session, Gather town, June 7, 2021.

15. *Quantifying the shape of time series with TDA and network-based methods.* AI and Topology Track, EPFL Applied Machine Learning Days, Online due to COVID-19, May 10, 2021.

16. *Combining network analysis and persistent homology for classifying behavior of time series.* Applied Mathematics and Complex Systems Seminar, University of Western Australia, Online due to COVID-19, May 6, 2021.

17. *The Truncated Interleaving Distance for Reeb Graphs.* Topological Data Analysis Workshop, IMSI, Online due to COVID-19, April 27, 2021.

18. *Utilizing Persistent Homology for Classifying Behavior of Time Series.* Computational Topology Class, University of Utah, Online due to COVID-19, April 22, 2021.

19. *Measuring the Shape of Hurricanes.* MSU Undergraduate Math Club, Online due to COVID-19, April 6, 2021.

20. *Combining network analysis and persistent homology for classifying behavior of time series.* Applied Math Colloquium, University of Arizona, Online due to COVID-19, March 12, 2021.

21. *Averaging Merge Trees.* EPFL Applied Topology Seminar, Online due to COVID-19, March 9, 2021.

22. *The Truncated Interleaving Distance for Reeb Graphs.* Joint Mathematics Meetings, Online due to COVID-19, Jan 9, 2021.

23. *Python Tutorial on Topological Data Analysis (TDA).* AMS Short Course on Mathematical and Computational Methods for Complex Social Systems, Joint Mathematics Meetings, Online due to COVID-19, Jan 5, 2021.

24. *Persistent homology of complex networks for dynamic state detection in time series.* Topological Data Analysis and Beyond Workshop, Neurips 2020, Online due to COVID-19, Dec 11, 2020.

25. *The Truncated Interleaving Distance for Reeb Graphs.* TGDA Seminar, Ohio State University, Online due to COVID-19, Nov 17, 2020.

26. *Combining network analysis and persistent homology for classifying behavior of time series.* CMSE Brownbag Seminar, MSU, Nov 13, 2020.

27. *Combining network analysis and persistent homology for classifying behavior of time series.* Virtual Mathematics Colloquium, Clarkson University, Online due to COVID-19, Oct 19, 2020.

28. *Combining network analysis and persistent homology for classifying behavior of time series.* Second Symposium on Machine Learning and Dynamical Systems, Fields Institute, Online due to COVID-19, Sep 29, 2020.

29. *The Truncated Interleaving Distance for Reeb Graphs.* GEOTOP-A Online Seminar, Sep 18, 2020.

30. *Convergence of Mapper Graphs.* MSU TDA Seminar, East Lansing, MI, Aug 6, 2020.

31. *Featurization of Persistence Diagrams using Template Functions for Machine Learning Tasks.* Diff CVML - CVPR Keynote, Online due to COVID-19., June 29, 2020.

32. *Topological Data Analysis for Quantifying Plant Morphology.* SIAM MDS, Online due to COVID-19., June 2, 2020.

33. *Drawing Time-Varying Reeb Graphs.* MSU AMS/AWM Grad Student Seminar, Mar 9, 2020.

34. *Applications of TDA: From Reeb Graphs to Diagrams, From Time Series to Plant Morphology.* MSU TDA Seminar, East Lansing, MI, Mar 9, 2020.

35. *Featurization of Persistence Diagrams using Template Functions for Machine Learning Tasks.* Applied Algebraic Topology Research Network (AATRN), Online Seminar, Jan 29, 2020.

36. *Featurization of Persistence Diagrams using Template Functions for Machine Learning Tasks.* Joint Math Meetings (JMM), Denver, CO, Jan 17, 2020.

37. *Featurization of Persistence Diagrams using Template Functions for Machine Learning Tasks.* Canadian Mathematical Society Winter Meeting, Toronto, Canada, Dec 7, 2019.

38. *Measuring the Shape of Data: The Shape of Hurricanes.* Big Data Colloquium, Grand Valley State University, Allendale, MI, Nov 22, 2019.

39. *Featurization of Persistence Diagrams for Classifying Attractors.* SIAM Dynamical Systems, Snowbird, Utah, May 22, 2019.

40. *Featurization of persistence diagrams using template functions for machine learning tasks.* SIAM Great Lakes Sectional Meeting, University of Michigan, Ann Arbor, MI, April 27, 2019.

41. *Utilizing persistent homology for classifying behavior of time series.* Workshop on Data Driven Dynamics: Algebraic Topology, Combinatorics and Analysis, CRM, Montreal, Canada, April 18, 2019.

42. *The Interleaving Distance for a Category with a Flow.* MSU AMS/AWM Grad Student Seminar, Feb 7, 2019.

43. *The Interleaving Distance for a Category with a Flow.* Upstate New York Topology Seminar, Albany, NY, Nov 10, 2018.

44. *Quantum Computation in a Topological Data Analysis Pipeline.* 2018 D-Wave Qubits North America, Knoxville, TN, Sep 25, 2018.

45. *Interleavings for categories with a flow and the hom-tree lower bound.* BIRS-CMO Workshop on Multiparameter Persistent Homology, Oaxaca, Mexico, Aug 9, 2018.

46. *Topological Data Analysis.* Summer Undergraduate Research Institute in Experimental Mathematics (SURIEM), MSU, East Lansing, MI, June 21, 2018.

47. *Topological Data Analysis.* iCER ACRES REU, MSU, East Lansing, MI, June 13, 2018.

48. *Topological Data Analysis for Time Series Analysis.* Abel Symposium, Geiranger, Norway, June 6, 2018.

49. *Reeb graphs, Mapper graphs, and Metrics.* IMA Special Workshop: Bridging Statistics and Sheaves, Minneapolis, MN, May 21, 2018.

50. *Approximating Continuous Functions on Persistence Diagrams for Machine Learning Tasks.* TRIPODS Seminar: Geometry and Topology of Data, ICERM, Brown University, Providence, RI, December 13, 2017.

51. *Quantifying and Comparing Shape in Data.* Colloquium, Dept of Mathematics, University of Michigan at Dearborn, Dearborn, MI, December 6, 2017.

52. *Approximating Continuous Functions on Persistence Diagrams for Machine Learning Tasks.* Geometry and Topology Seminar, Math Dept, MSU, East Lansing, MI, November 16, 2017.

53. *What is Topological Data Analysis.* CMSE Brown-bag Lecture Series, MSU, East Lansing, MI, October 17, 2017.

54. *Applications of Persistence to Time Series Analysis.* SIAM Central States Section 2017 Meeting, Colorado State University, Fort Collins, CO, September 30, 2017.

55. *Introduction to Categorical Approaches in Topological Data Analysis II.* Topology, Computation and Data Analysis, Schloss Dagstuhl, Wadern, Germany, July 17, 2017.

56. *Applications of Persistence to Time Series Analysis.* SIAM Conference on Dynamical Systems, Snowbird, Utah, May 23, 2017.

57. *Reeb graphs, Mapper graphs, and Metrics.* 47th Annual John H. Barrett Memorial Lectures, University of Tennessee - Knoxville, TN, Mar 2, 2017.

58. *The Convergence of Mapper.* AWM Research Symposium, UCLA, Los Angeles, CA, Apr 8, 2017.

59. *The Convergence of Mapper.* Brown University, Providence, RI, Mar 9, 2017.

60. *A Topological Approach to Data Science.* Dept. of Mathematics, Montana State University, Bozeman, MT, Feb 13, 2017.

61. *A Topological Approach to Data Science.* Dept. of Computational Mathematics, Science, and Engineering, Michigan State University, East Lansing, MI, Jan 11, 2017.

62. *The interleaving distance for posets.* Joint Mathematics Meetings, Atlanta, GA, Jan 4, 2017.

63. *The Convergence of Mapper.* New York Applied Topology Meetings, Columbia University, New York, NY, Dec 9, 2016.

64. *The interleaving distance for posets.* Union College Mathematics Conference, Schenectady, NY, Dec 3, 2016.

65. *The Reeb graph interleaving distance.* Computer Science Seminar, St. Louis University, Oct 12, 2016.

66. *Utilizing Topological Data Analysis to Detect Periodicity.* International Workshop on Topological Data Analysis in Biomedicine at ACM-BCB, Seattle, WA, Oct 2, 2016.

67. *The interleaving distance.* Geometry and Topology Seminar, Math Department, University at Buffalo, Buffalo, NY, Sep 23, 2016.

68. *Applications of Persistence to Time Series Analysis.* Topology, Geometry, and Data Analysis Conference (TGDA), Ohio State University, Columbus, OH, May 20, 2016.

69. *Topological Data Analysis.* Junior STEM Idea Exchange (JUSIE): Lightning event, Albany, NY, May 10, 2016.

70. *What Does it Mean for Data to Have Shape?.* Workshop on the Shape of Educational Data, Fairfax, VA, April 7, 2016.

71. *The Reeb Graph Interleaving Distance and its Application to Data Analysis.* Combinatorics Seminar, SUNY Binghamton, Binghamton, NY, Mar 15, 2016.

72. *Topological Data Analysis and its Application to Atmospheric Science Data.* Dept of Atmospheric and Environmental Sciences Colloquium, UAlbany, Albany, NY, Feb 15, 2016.

73. *Topological Data Analysis.* Math Department Student Seminar, Union College, Schenectady, NY, Jan 19, 2016.

74. *Applied Category Theory and the Reeb Graph Interleaving Distance.* Geometry and Topology Seminar, NCSU, Raleigh, NC, Jan 13, 2016.

75. *Complexity of the Reeb Graph Interleaving Distance.* CS Theory Seminar, NCSU, Raleigh, NC, Jan 11, 2016.

76. *Reeb Graph Approximation with Guarantees.* Joint Mathematics Meetings, Seattle, WA, Jan 9, 2016.

77. *Reeb Graph Approximation with Guarantees.* Fall Workshop on Computational Geometry (FWCG), Buffalo, NY, Oct 23, 2015.

78. *The Reeb Graph Interleaving Distance .* UAlbany - Algebra/Topology Seminar, Sep 3 (Part I) and Sep 10 (Part II), 2015.

79. *A New Metric for $\mathbb{R}$-graph Comparison.* AFRL Annual Applied Topology Workshop, Rome, NY, Aug 7, 2015.

80. *Demo: Using Perseus to Compute Persistent Homology.* UAlbany Applied Topology Reading Group, Aug 6, 2015.

81. *The Interleaving Distance.* CG Week, Symposium on Computational Geometry (SoCG), Eindhoven, Netherlands, June 25, 2015.

82. *Strong Equivalence of the Interleaving and Functional Distortion Metrics for Reeb Graphs.* Symposium on Computational Geometry (SoCG), Eindhoven, Netherlands, June 24, 2015.

83. *Using Topology to Understand Big Data.* Junior STEM Idea Exchange (JUSIE), University at Albany - SUNY, Mar 25, 2015.

84. *Strong Equivalence of Reeb Graph Metrics.* Invited Lecture, TU Munich, Munich, Germany, Mar 17, 2015.

85. *The Cosheaf-Less Reeb Graph Interleaving Distance.* Seminar on Computational Geometry, Schloss Dagstuhl, Wadern, Germany, Mar 12, 2015.

86. *The Interleaving Distance for Reeb Graphs.* Applied Algebraic Topology Research Network - Online Seminar, Feb 25, 2015.

87. *Using Topology to Understand Big Data.* Women in Science and Engineering (WISH) Lunch, University at Albany, Albany, NY, Jan 15, 2015.

88. *Towards Predicting and Preventing Machine Chatter Using Persistent Homology.* Invited lecture, Workshop on Topology : Identifying Order in Complex System, Rutgers, New Brunswick, NJ, Oct 18, 2014.

89. *Using Topology to Understand Big Data.* Invited lecture, Modern Math Workshop, Los Angeles, CA, Oct 16, 2014.

90. *Interleavings of Reeb Graphs.* Invited Lecture, AIM Workshop on Generalized Persistence and Applications, Sept 18, 2014.

91. *Interleavings of Reeb Graphs.* Invited Lecture, ATMCS 6, Vancouver, Canada, May 29, 2014.

92. *Topological Data Analysis :: Persistent Homology and Applications.* Invited Lecture, Systems Information Learning Optimization (SILO), University of Wisconsin - Madison, Madison, WI, April 23, 2014.

93. *A Distance Measure on Reeb Graphs.* Invited Lecture, Topology, Geometry and Data Seminar, Ohio State University, Columbus, OH, April 11, 2014.

94. *Using Persistence to Explore Equilibria of Delay Equations.* Invited Lecture, Spring Topology and Dynamics Conference, University of Richmond, Richmond, VA, March 14, 2014.

95. *Categorification of Reeb Graphs.* Invited Lecture, Workshop on Topological Systems : Communication, Sensing, and Actuation, IMA, Minneapolis, MN, March 6, 2014.

96. *Categorification of Reeb Graphs.* SAMSI Workshop, LDHD: Topological Data Analysis, Durham, NC, February 5, 2014.

97. *Extending Statistical Methods to Computational Topology.* SIAM Minisymposium on Applied and Computational Geometry, JMM, Baltimore, MD, January 17, 2014.

98. *A Statistical Approach for Improving Topological Data Analysis.* University of Rochester, Rochester, NY, January 10, 2014.

99. *Categorification of Reeb Graphs.* Topology Seminar, Tulane University, New Orleans, LA, November 5, 2013.

100. *Categorification of Reeb Graphs.* IMA Postdoc Seminar, University of Minnesota, Minneapolis, MN, October 22, 2013.

101. *A Continuous Mean for Finite Sets of Persistence Diagrams.* Invited Lecture, Workshop: Topological Data Analysis, IMA, University of Minnesota, Minneapolis, MN, October 10, 2013.

102. *A Continuous Mean for Distributions of Persistence Diagrams.* Invited Lecture, SIAM Conference on Applied Algebraic Geometry, Fort Collins, CO, August 2, 2013.

103. *An Introduction to Topological Data Analysis.* Invited Lecture, SUNYIT, Utica, NY, June 11, 2013.

104. *Applications of Persistent Homology to Time Varying Systems.* PhD Defense, Duke University, March 28, 2013.

105. *Using Persistent Homology to Analyze Behavior in Dynamic Point Clouds.* SIAM Student Chapter Lecture Series, Colorado State University, Fort Collins, CO, November 5, 2012.

106. *Using Persistent Homology to Analyze Dynamic Point Clouds.* Data Research Training Grant Seminar, Duke University, Durham, NC, October 22, 2012.

107. *An Intro to Persistent Homology and Some Applications.* Graduate/Faculty Seminar, Duke University, Durham, NC, September 7, 2012.

108. *Metrics on Vineyards.* Computational Geometry Week, Chapel Hill, NC, June 20, 2012.

109. *Primates and Vineyards.* Duke University Math Slam, Duke University, Durham, NC, March 23, 2012.

110. *Utilizing Ideas from Persistent Homology to Compute Probabilistic Sensor Network Coverage.* Algebra/Combinatorics Seminar, NC State University, Raleigh,NC, January 13, 2012.

111. *Applied Topology: Basic Ideas and a Mess of Applications.* Graduate/Faculty Seminar, Duke University, Durham, NC, October 14, 2011.

112. *Using Persistent Homology to Compute Probabalistic Failure of a Sensor Network.* SIAM Conference on Applied Algebraic Geometry, Raleigh, NC, October 6, 2011.

113. *Computing Probabilistic Sensor Network Coverage via Algorithms Utilizing Persistent Homology.* Geometry and Topology Reading Group, Institute of Science and Technology, Klosterneuburg, Austria, June 20, 2011.

114. *Computing Probabilistic Sensor Network Coverage via Algorithms Utilizing Persistent Homology.* Computational Geometry Seminar, UNC Chapel Hill, Chapel Hill, NC, February 3, 2011.

115. *Failure Filtrations and Coverage of Fenced Sensor Networks.* Graduate/Faculty Seminar, Duke University, November 19, 2010.

TEACHING EXPERIENCE

Course	Title	Institution	Semesters	Eval.
CMSE 201	Intro to Computational Modeling and Data Analysis	MSU	Spring, 2018	1.81*
CMSE 381	Fundamentals of Data Science Methods	MSU	Spring, 2022	
CMSE 801	Intro to Computational Modeling	MSU	Spring, 2020	1.36*
CMSE 802	Methods Computational Modeling	MSU	Spring, 2021	1.12*
CMSE 491/890	Topological Analysis of Large Datasets	MSU	Fall, 2017 Fall, 2021	1.75/1.18*
MTH 132	Calculus I	MSU	Fall, 2020	1.52*†
MTH 481	Discrete Mathematics I	MSU	Fall, 2018	1.42*
AMAT 840	Applied Topology	UAlbany	Spring, 2015	4.50
AMAT 587	Graph Theory	UAlbany	Fall, 2015	5.00
AMAT 540B	Topology II	UAlbany	Spring, 2017	4.60
AMAT 502	Modern Computing for Mathematicians	UAlbany	Spring, 2016	5.00
AMAT 363	Statistics	UAlbany	Fall, 2014	4.96
			Fall, 2015	4.87
			Spring, 2016	4.84
			Spring, 2017	4.67
TIP	Mobius Strips, Klein Bottles, and Fractals: The Mathematics of Distortion	Duke TIP	July, 2012	4.82
Math 32L	Laboratory Calculus II	Duke	Spring, 2011	4.00
Math 31L	Laboratory Calculus I	Duke	Fall, 2009	3.00
Math 25L	Laboratory Calculus and Functions I	Duke	Fall, 2008	

*Note that while all evaluation scores are provided out of 5, MSU defines a score of 1 to be the best, while all other scores are based on 5 as the best. Those evaluations using a best score of 1 are marked with an asterisk.

†Aggregated score. Due to Covid-19, course was taught online, with 337 official students of record across 13 sections.

STUDENTS ADVISED

Current Graduate Students

Erik Amézquita, PhD Student, MSU CMSE *Jointly advised with Dan Chitwood*	Sep 2018 - Present
Sarah McGuire, PhD Student, MSU CMSE	Sep 2019 - Present
Xinyi (Elena) Wang, PhD Student, MSU CMSE	Sep 2020 - Present
Christopher Potvin, PhD Student, MSU Math	Jan 2021 - Present
Rachel Roca, PhD Student, MSU CMSE *Jointly advised with Danny Caballero*	Sep 2021 - Present
David Munoz, PhD Student, MSU CMSE	Jan 2022 - Present
Astrid Olave, PhD Student, MSU CMSE	Jan 2022 - Present
Valeri Jean-Pierre, PhD Student, MSU Math	Jan 2022 - Present
Ishika Ghosh, PhD Student, MSU CMSE	Aug 2022 - Present

İsmail Güzel, Visiting Researcher, MSU CMSE   Sep 2022 - Aug 2023

Postdocs

Sourabh Palande, Postdoc, MSU CMSE   Sep 2020 - Present
Jointly advised with Dan Chitwood

Sarah Percival, Postdoc, MSU BMB   Sep 2021 - Present
Jointly advised with Dan Chitwood, Beronda Montgomery, Arjun Krishnan,
and Aman Husbands (OSU)

Former Group Members

Anastasios Stefanou, PhD student, UAlbany Math   Oct 2015 - Aug 2018
Jointly advised with Justin Curry
First job post-PhD: Postdoc, Ohio State University

Sarah Tymochko, PhD Student, MSU CMSE   Sept 2017 - May 2022
First job post-PhD: Postdoc, UCLA

Christopher Sukhu, MS Student, MSU CMSE   May 2017 - May 2019

Mitchell Eithun, MS Student, MSU CMSE   Jan 2018 - Aug 2019
Jointly advised with Dan Chitwood

Shelley Kandola, Postdoc, MSU Math   Sep 2019 - July 2021

Tim Ophelders, Postdoc, MSU CMSE   Sep 2018 - Aug 2020
Jointly advised with Dan Chitwood

Michelle Quigley, Postdoc, MSU Horticulture   Sep 2018 - Sep 2020
Jointly advised with Dan Chitwood

Committee Membership

Danielle Barnes, PhD Student, Advisor: José Perea, MSU CMSE   Sept 2017 - Present

Chris St. Clair, PhD Student, Advisor: Matt Hedden, MSU Math   Oct 2020 - Present

Brian Bollen, PhD Student, Advisor: Josh Levine,   Sept 2020 - Present
Arizona State University Program in Applied Mathematics

Alexander Harnisch, PhD Student,   March 2021 - Present
Advisor: Claudio Kopper, MSU PA/CMSE

Michael Quail, PhD Student,   Nov 2021 - Present
Advisor: Kristen Bieda, MSU Program in Mathematics Education

Rachel Domagalski, PhD Student, Advisor: Bruce Sagan, MSU Math Graduated Aug 2021

Nick Young, PhD Student, Advisor: Danny Caballero,   Graduated August 2021
MSU Physics/CMSE

Zixuan Cang, PhD Student, Advisor: Guowei Wei, MSU Math   Graduated July 2018

Hitesh Gakhar, PhD Student, Advisor: José Perea, MSU Math   Graduated May 2020

Luis Polanco, PhD Student, Advisor: José Perea, MSU CMSE/Math Graduated May 2022

Audun Myers, PhD Student, Advisor: Firas Khasawneh, MSU ME   Graduated May 2022

Melih Yesili, PhD Student, Advisor: Firas Khasawneh, MSU ME   Graduated May 2022

Undergraduate and High School Students

Yash Gautam, Undergraduate Student, Professorial Assistant, MSU   Sep 2020 - Present

Vee Kalkunte and Sean Bergen, Undergraduate Students, ACRES REU, MSU	Summer 2021
Levent Batakci, Abby Branson, Bryan Castillo, Candace Todd	Summer 2020
SURIEM REU, MSU	
Kayla Makela, Undergraduate Student, MSU	Jan 2018 - Aug 2020
Joseph Sigler, Undergraduate Student, Professorial Assistant, MSU	Sep 2017 - May 2019
Monika Francsics, Undergraduate Student, MSU	Summer 2018
Brian Bollen, Undergraduate Student, UAlbany	May 2016 - Aug 2017
Akanksha Atrey, Undergraduate Student, UAlbany	Jan 2015 - June 2016
Bill Dong, High School Student, UAlbany	Jun 2015 - Aug 2016

SERVICE

Departmental and University Service

MSU TDA Seminar, Creator and Co-Organizer with Shelley Kandola	Mar 2020 - Present
CMSE Advisory Committee (AdCom), MSU	
Secretary	Sept 2017 - Aug 2018
Member	Sept 2020 - present
CMSE Hiring Committees, MSU	
TT Data Science	Sept 2021- Feb 2022
1855 Data Science	Mar 2022 - present
CMSE Graduate Studies Committee, MSU	
Chair	Sept 2018 - Aug 2020
Member	Sept 2020 - Aug 2021
Member of College of Engineering Graduate Studies Commitee, MSU	Sept 2018 - Aug 2020
Member of CMSE Awards Committee, MSU	Sept 2019 - Aug 2020
CNS Strategic Plan Integration Committee, MSU	Jan 2020 - Dec 2020
Panel on Academic Careers for Engineering Graduate Students, MSU	Nov 26, 2019
Member, Executive Committee for PlantBio NSF-NRT Grant, MSU	Sept 2018 - Aug 2019
Math Dept. Graduate Committee, UAlbany	Sept 2016 - Aug 2017
Math Dept Representative, UAlbany Undergraduate Research Information Session and Forum	Mar 2016
Faculty Speaker, UAlbany Math Department Graduation Ceremony	May 2015
Organizer, UAlbany Reading Group on Applied Topology	Summer 2015
UAlbany Math Dept Colloquium Committee	Sept 2014-Aug 2017
Organizer for the IMA Postdoc Seminar	Sept 2013-Aug 2014
President, Noetherian Ring of Duke University	Sept 2012-May 2013
Mathbio Seminar Organizer, Duke Math Dept	Spring 2012
Project Mentor: Duke Workshop on Applications of Math to Physiology and Medicine	May 16-20, 2011
Tea Organizer for Duke Mathematics Dept	Sept 2010 - May 2011
Graduate Student Representative for Duke Math Department	Jan 2009 - Dec 2009

Professional Service

Organizer, Workshop on Topological Signal Processing at SIAM DS 21	May 2021
Workshop Committee Member, Symposium on Computational Geomtry (SoCG)	2020
Program Committee Member, Women+ Data Science Monthly Meetup, MSU	Fall 2020
Mentor, National Alliance for Doctoral Studies in the Mathematical Sciences	Fall 2020 - present
Steering Committee Member, ATMCS	Mar 2017 - present
Steering Committee Member, Women in Computational Topology	Sep 2016 - present

Organizer, IMA Workshop: Bridging Statistics and Sheaves	May 2018
Organizer for Special Session on Sheaves in TDA at the Joint Math Meetings	Jan 2017
Organizer, The 4th Annual Minisymposium on Computational Topology, CG Week at the Symposium on Computational Geometry	Jun 2015
Session Organizer, AWM Research Symposium	Apr 2015
Organizer for Special Session at the Joint Math Meetings	Jan 2013

Community Outreach

Panelist on Careers in Academia, Women in Science Conference, Notre Dame	Oct 2018
Interview for The Girls' Angle Bulletin, ISSN 2151-5700	Oct/Nov 2015
NYS Master Teacher Program Application Review Committee	Sept 2014
Volunteer for FEMMES Capstone Events	April 2011, April 2012

Editorial Boards & Conference Program Committees

Inaugural Editorial Board Member, Computing in Geometry and Topology (CGT)	2021-Present
Program Committee Member, Symposium on Computational Geometry (SoCG)	2023
Program Committee Member, "Applications of Topological Data Analysis to Big Data" Workshop, IEEE Big Data Conference	2021
Program Committee Member, Symposium on Computational Geometry (SoCG)	2018
Program Committee Member, Fall Workshop on Computational Geometry	2014, 2016
Scientific Committee, ATMCS7, Torino, Italy Applied Topology: Methods, Computation, and Science	Jul 2016

Review and Referee

Journals

AMS Notices	2022
Chaos	2021
Climate Dynamics	2021
Computational Geometry: Theory and Applications	2016
Discrete and Computational Geometry	2015, 2019
Image and Vision Computing	2020
Medical Image Analysis	2020
Journal of Applied and Computational Topology (JACT)	2018-2021
Journal of Computational Geometry (JoCG)	2018, 2019, 2021
Journal of Machine Learning Research (JMLR)	2017
Patterns	2021
PLOS ONE	2015, 2016
PNAS	2022
Science Advances	2021
SIAM Journal on Applied Algebra and Geometry (SIAGA)	2017
SIAM Journal on Mathematics of Data Science (SIMODS)	2022
SIAM Review	2021
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)	2019, 2020
WIRES Computational Statistics	2019

Conferences

International Symposium on Algorithms and Computation (ISAAC)	2017
Symposium on Computational Geometry (SoCG)	2014, 2016, 2018, 2019, 2020, 2021
Symposium on Discrete Algorithms (SoDA)	2017, 2020
International Conference on Robotics and Automation (ICRA)	2019
IEEE Scientific Visualization (SciVis)	2019

Funding agencies

NSF: CISE	2016, 2018, 2019, 2021, 2022
NSF: DMS	2018, 2019
AFOSR	2022

Other

| MathSciNet | 2018-Present |
| zbMath | 2021-Present |

PROFESSIONAL AFFILIATIONS

American Mathematical Society (AMS)
Society for Industrial and Applied Mathematics (SIAM)
Association for Women in Mathematics (AWM)
Association for Computing Machinery (ACM)
Math Alliance Mentor
National Association of Mathematicians (NAM)
American Harp Society (AHS)

TECHNICAL STRENGTHS

| **Software and Coding** | Python, MATLAB, R, LaTeX, Inkscape, HTML, CSS |
| **Operating Systems** | Linux, Windows, Android |