

XINYI (ELENA) WANG

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EDUCATION

Michigan State University

PhD in Computational Mathematics, Science, and Engineering

Research Interest: Topological Data Analysis, Machine Learning

East Lansing, MI

Expected May 2025

Advisor: Dr. Elizabeth Munch

College of the Holy Cross

Bachelor of Arts in Mathematics and Music with High Honors, Cum Laude

Thesis: *Invariant Theory in Characteristic p*

Worcester, MA

May 2020

Advisor: Dr. John Little

RESEARCH EXPERIENCE

Michigan State University

Graduate Research Assistant

East Lansing, MI

September 2020 – Present

ICERM at Brown University, Semester Program: Math + Neuroscience

Long Term Visitor

Providence, RI

Fall 2023

Lawrence Berkeley National Laboratory

Ph.D. Intern; Mentor: Dr. Dmitriy Morozov

Berkeley, CA

March – August 2023

College of the Holy Cross

Undergraduate Researcher - Mathematics Honors Senior Thesis

Weiss Summer Research Student in the Science and Mathematics

Weiss Summer Research Student in the Humanities, Social Sciences, and Arts

Worcester, MA

September 2019 – May 2020

Summer 2017, 2018

Summer 2019

PUBLICATION

- A. Hwang, **X. Wang**. “Clairaut Surfaces in Euclidean Three-Space,” In: *Tōhoku Math. J.*, **74** no. 2, 215–227, 2022.
- R. Liu, S. Canturk, F. Wenkel, S. McGuire, **X. Wang**, A. Little, L. O’Bray, M. Perlmutter, B. Rieck, M. Hirn, G. Wolf, L. Rampašek. “Taxonomy of Benchmarks in Graph Representation Learning,” In: *Proceedings of the First Learning on Graphs Conference*, volume 198 of *Proceedings of Machine Learning Research*, pages 6:1–6:25. PMLR, 09–12 Dec 2022.
- L. Baily, H. S. Blake, G. Cochran, N. Fox, M. Levet, R. Mahmoud, E. Matson, I. Singgih, G. Stadnyk, **X. Wang**, A. Wiedemann. “Complexity and Enumeration in Models of Genome Rearrangement,” accepted to COCOON, available on arXiv.
- N. Wiley, **X. Wang**, E. Munch. “An Optimization of Euler Characteristic Transform Computation on Embedded Graphs,” *in preparation*.
- **X. Wang**, E. Munch, E. W. Chambers, S. Percival. “A Distance for Geometric Graphs via the Labeled Merge Tree Interleaving Distance,” *in preparation*.

CONFERENCES AND PRESENTATIONS

Pomona College Colloquium (*invited*)

The Shape of Data

Claremont, CA

April 2024

Albion College Mathematics and Computer Science Colloquium (*invited*)

Unraveling Hidden Patterns with Topological Data Analysis (TDA)

Albion, MI

March 2024

Museum of Mathematics (*invited*)

Breaking limits and influencing the future: a panel discussion

Virtual

February 2024

Joint Mathematics Meetings (<i>invited</i>) The Labeled Merge Tree Interleaving Distance and its Application	San Francisco, CA <i>January 2024</i>
Northeastern University Graduate Student Seminar (<i>invited</i>) The Labeled Merge Tree Interleaving Distance and its Application	Boston, MA <i>October 2023</i>
ICERM Topology and Geometry in Neuroscience Workshop Directed Labeled Merge Tree Distance for Geometric Graphs	Providence, RI <i>October 2023</i>
ICERM at Brown University Graduate Student Seminar Directed Labeled Merge Tree Distance for Geometric Graphs	Providence, RI <i>September 2023</i>
Computational Persistence The Labeled Merge Tree Interleaving Distance and its Application	West Lafayette, IN <i>September 2023</i>
TDA Week Directed Labeled Merge Tree Distance for Geometric Graphs	Kyoto, Japan <i>August 2023</i>
International Symposium on Computational Geometry Directed Labeled Merge Tree Distance on Classification of <i>Passiflora</i> Leaves	Dallas, TX <i>June 2023</i>
Randomness in Topology and its Applications A Distance for Geometric Graphs via the Labeled Merge Tree Interleaving Distance	Chicago, IL <i>March 2023</i>
8th Mexican Workshop on Applied Geometry and Topology A Distance for Geometric Graphs via the Labeled Merge Tree Interleaving Distance	Virtual <i>November 2022</i>
SIAM Conference on Mathematics of Data Science A Distance for Geometric Graphs via the Labeled Merge Tree Interleaving Distance	San Diego, CA <i>September 2022</i>
Algebraic Topology and TDA Hosted by the Institute for Mathematics and its Applications	Minneapolis, MN <i>August 2022</i>
Algebraic Topology: Methods, Computation, and Science Hosted by the Mathematical Institute, University of Oxford	Oxford, UK <i>June 2022</i>
Mathematics Research Communities Single-Cut and Join in Genome Rearrangement	Java Center, NY <i>June 2022</i>
Joint Mathematics Meetings Invariant Theory in Characteristic p	Denver, CO <i>January 2020</i>
Joint Mathematics Meetings Clairaut Surfaces in Euclidean Three-Space	Baltimore, MD <i>January 2019</i>

MENTORING AND TEACHING EXPERIENCE

Graduate Research Mentor <i>Michigan State University</i> - Denis Selyuzhitsky - Ray Hasan - Nathan Willey (now PhD student at the Ohio State University)	East Lansing, MI <i>September 2022 – Present</i> <i>September 2023 - Present</i> <i>September 2023 - Present</i> <i>September 2022 - May 2023</i>
Teaching Assistant, Department of CMSE <i>Michigan State University</i> - CMSE201: Computational Modeling and Data Analysis	East Lansing, MI <i>Spring 2024</i>
REU Graduate Research Mentor <i>Michigan State University</i> - Mentored a group of 10 undergraduate students at the <i>Advanced Computational Research Experience for Students</i> (ACRES) REU program. Their projects cover a wide range of fields such as physics, plant biology,	East Lansing, MI <i>June 2022 - August 2022</i>

and network studies

- Provided computational and mathematical guidance and hosted workshops on research-related topics

Teaching Assistant, Department of Mathematics and CS

College of the Holy Cross

- MATH241 Multivariable Calculus
- MATH243 Mathematical Structures
- MATH244 Linear Algebra
- MATH361 Real Analysis

Worcester, MA

Fall 2017 - March 2020

Fall 2017, 2018

Fall 2019

Spring 2018, 2019

Spring 2020

Teaching Assistant, Department of Music

College of the Holy Cross

- MUSC201 Music Theory 1
- MUSC202 Music Theory 2
- MONT110G Jazz, Civil Rights, Hip Hop
- MONT110G Music, Politics and Culture

Worcester, MA

Fall 2017 - Spring 2019

Fall 2017, 2018, 2019

Spring 2018, 2019

Fall 2019

Spring 2020

GRANTS, AWARDS, AND HONORS

Engineering Leadership Fellow

Outreach fellowship awarded to student leaders

Michigan State University

Fall 2023 – Present

Distinguished Engineering Scholar

Awarded to outstanding students to graduate study in engineering

Michigan State University

Fall 2020 – Spring 2021

Raymond P. and Marie M. Ginther Graduate Fellowship

Research fellowship awarded to selected first-year graduate students

Michigan State University

Fall 2020

Museum of Mathematics MOST Fellow

Outreach fellowship awarded to 10 early-career female mathematicians

MoMath

August 2023

Travel Grants for TDA Week 2023

Travel support for attending TDA Week

Kyoto University

August 2023

Travel Grants for CG Week 2023

Travel support for attending CG Week

UT Dallas

July 2023

Pi Mu Epsilon

Mathematical Honors Society

College of the Holy Cross

Inducted 2020

MAA Poster Session Outstanding Poster Award

Awarded to recognize best posters in MAA Undergraduate Poster Session

Joint Mathematics Meeting

January 2019

The Beethoven Prize

Awarded to an outstanding music major

College of the Holy Cross

May 2020

SERVICE AND ACTIVITIES

Participant, Mathematics Outreach Seminar and Training (MOST) Program New York, NY

National Museum of Mathematics

July, 2023

- Developed the ability to share mathematics with the general public in an engaging, accessible way
- Created a one-hour talk designed to share their area of mathematical expertise with a general audience

Graduate Student Liaison/Vice President, Department of CMSE

Michigan State University

East Lansing, MI

September 2021 - August 2023

- Responsible for serving on the Graduate Studies and Admissions Committee as the sole graduate student representative

- Provide feedback and input on curriculum decisions, qualifying exams, scholarship awards, and new student enrollment
- Actively contribute to department-wide Diversity, Equity, and Inclusion efforts

Student Representative, CMSE Hiring Committee

Michigan State University

East Lansing, MI

October 2021 - March 2022

- Appointed as the graduate student representative on the faculty hiring committee
- Evaluated candidates for a tenure-tracked position and provided feedback

REVIEW AND REFEREE

- International Symposium of Computational Geometry (SoCG) (Subreviewer) *2023*
- Conference and Workshop on Neural Information Processing Systems (NeurIPS) *2022, 2023*
- Journal of Applied and Computational Topology *2023*

PROFESSIONAL EXPERIENCE

Research Analyst Intern

Caitong Fund Management Company

Shanghai, China

May - September 2020

- Developed data-driven insights on the future direction of 15 companies across 4 industries
- Presented 3 investment ideas to Caitong's investment community and helped investors harness data science to enhance their process

SKILLS AND INTERESTS

Programming: Python, L^AT_EX, SQL, MATLAB, OpenMP/MPI, Magma, Maple, Fortran

Interests: Piano and Flute Performance, Cooking and Gastronomy

Languages: Fluent Mandarin and English, Conversational French