XINYI (ELENA) WANG

+1(617)653-3677 ⋄ wangx249@msu.edu

EDUCATION

Michigan State University East Lansing, MI
Ph.D. in Computational Mathematics, Science, and Engineering *Expected May 2025*
Thesis: *Topological Data Analysis on Graphs* Advisor: Dr. Elizabeth Munch

College of the Holy Cross Worcester, MA
B.A. in Mathematics and Music with High Honors, Cum Laude *May 2020*
Thesis: *Invariant Theory in Characteristic p* Advisor: Dr. John Little

RESEARCH EXPERIENCE

Research Interest: Topological Data Analysis, Computational Geometry, Machine Learning

Michigan State University East Lansing, MI
Graduate Research Assistant *September 2020 – Present*

ICERM at Brown University, Program on Math + Neuroscience Providence, RI
Long Term Visitor *Fall 2023*

Lawrence Berkeley National Laboratory Berekeley, CA
Ph.D. Intern; Mentor: Dr. Dmitriy Morozov *March – August 2023*

College of the Holy Cross Worcester, MA
Undergraduate Researcher - Mathematics Honors Senior Thesis *September 2019 – May 2020*
Weiss Summer Research Student in the Science and Mathematics *Summer 2017, 2018*
Weiss Summer Research Student in the Humanities, Social Sciences, and Arts *Summer 2019*

PUBLICATION

∗ indicates first authorship, † indicates undergraduate collaborators

- A. Hwang, **X. Wang**. "Clairaut Surfaces in Euclidean Three-Space," In: *Tôhoku 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," In: *Computing and Combinatorics*, volume 14422, 3-14, 2024.

- E. W. Chambers, E. Munch, S. Percival, **X. Wang**∗. "A Distance for Geometric Graphs via the Labeled Merge Tree Interleaving Distance," submitted, available on arXiv.

CONFERENCES AND PRESENTATIONS

AATRN*(invited)* **Virtual**
Computing the Bottleneck Distance from All Directions *October 2024*

Spires Topology Conference *(poster)* **Oxford, UK**
Persistence-Informed Convolutional Neural Networks *August 2024*

Claremont Topology Seminar *(invited)* **Claremont, CA**
Topological Data Analysis on Embedded Graphs *April 2024*

Albion College Mathematics and Computer Science Colloquium *(invited)* **Albion, MI**
Unraveling Hidden Patterns with Topological Data Analysis (TDA) *March 2024*

National Museum of Mathematics *(invited)* **Virtual**
Breaking limits and influencing the future: a panel discussion *February 2024*

Joint Mathematics Meetings *(invited)* **San Francisco, CA**
The Labeled Merge Tree Interleaving Distance and its Application *January 2024*

Northeastern University Graduate Student Seminar *(invited)* **Boston, MA**
The Labeled Merge Tree Interleaving Distance and its Application *October 2023*

ICERM Topology and Geometry in Neuroscience Workshop **Providence, RI**
Directed Labeled Merge Tree Distance for Geometric Graphs *October 2023*

ICERM at Brown University Graduate Student Seminar **Providence, RI**
Directed Labeled Merge Tree Distance for Geometric Graphs *September 2023*

Computational Persistence **West Lafayette, IN**
The Labeled Merge Tree Interleaving Distance and its Application *September 2023*

TDA Week **Kyoto, Japan**
Directed Labeled Merge Tree Distance for Geometric Graphs *August 2023*

International Symposium on Computational Geometry **Dallas, TX**
Directed Labeled Merge Tree Distance on Classification of *Passiflora* Leaves *June 2023*

Randomness in Topology and its Applications **Chicago, IL**
A Distance for Geometric Graphs via the Labeled Merge Tree Interleaving Distance *March 2023*

8th Mexican Workshop on Applied Geometry and Topology **Virtual**
A Distance for Geometric Graphs via the Labeled Merge Tree Interleaving Distance *November 2022*

SIAM Conference on Mathematics of Data Science **San Diego, CA**
A Distance for Geometric Graphs via the Labeled Merge Tree Interleaving Distance *September 2022*

Algebraic Topology and TDA **Minneapolis, MN**
Hosted by the Institute for Mathematics and its Applications *August 2022*

Algebraic Topology: Methods, Computation, and Science **Oxford, UK**
Hosted by the Mathematical Institute, University of Oxford *June 2022*

Mathematics Research Communities **Java Center, NY**
Single-Cut and Join in Genome Rearrangement *June 2022*

Joint Mathematics Meetings **Denver, CO**
Invariant Theory in Characteristic p *January 2020*

Joint Mathematics Meetings **Baltimore, MD**
Clairaut Surfaces in Euclidean Three-Space *January 2019*

MENTORING AND TEACHING EXPERIENCE

Undergraduate Research Mentor **East Lansing, MI**
Michigan State University *September 2022 – Present*
- Denis Selyuzhitsky *September 2023 - Present*

- Ray Hasan *September 2023 - Present*
- Nathan Willey (now PhD student at the Ohio State University) *September 2022 - May 2023*

Teaching Assistant, Department of CMSE **East Lansing, MI**
Michigan State University *Spring 2024*
- CMSE201: Computational Modeling and Data Analysis

REU Graduate Research Mentor **East Lansing, MI**
Michigan State University *Summer 2022, 2024*
- SURIUM REU program (3 students) *Summer 2024*
- ACRES REU program (10 students) *Summer 2022*

Teaching Assistant, Department of Mathematics and CS **Worcester, MA**
College of the Holy Cross *Fall 2017 - March 2020*
- MATH241 Multivariable Calculus *Fall 2017, 2018*
- MATH243 Mathematical Structures *Fall 2019*
- MATH244 Linear Algebra *Spring 2018, 2019*
- MATH361 Real Analysis *Spring 2020*

Teaching Assistant, Department of Music **Worcester, MA**
College of the Holy Cross *Fall 2017 - Spring 2019*
- MUSC201 Music Theory 1 *Fall 2017, 2018, 2019*
- MUSC202 Music Theory 2 *Spring 2018, 2019*
- MONT110G Jazz, Civil Rights, Hip Hop *Fall 2019*
- MONT110G Music, Politics and Culture *Spring 2020*

PROFESSIONAL DEVELOPMENT

Certification in College Teaching **Michigan State University**
Awarded by the Graduate School at MSU *May 2024*

Undergraduate Mentorship Training **Michigan State University**
Two-day training program offered by the College of Engineering *June 2024*

GRANTS, AWARDS, AND HONORS

Dissertation Completion Fellowship **Michigan State University**
Fellowship awarded to students completing their dissertation *Fall 2024 – Spring 2025*

Engineering Leadership Fellow **Michigan State University**
Outreach fellowship awarded to student leaders *Fall 2023 – Present*

Distinguished Engineering Scholar **Michigan State University**
Awarded to outstanding students to graduate study in engineering *Fall 2020 – Spring 2021*

Raymond P. and Marie M. Ginther Graduate Fellowship **Michigan State University**
Research fellowship awarded to selected first-year graduate students *Fall 2020*

Museum of Mathematics MOST Fellow **MoMath**
Outreach fellowship awarded to 10 early-career female mathematicians *August 2023*

Travel Grants for TDA Week 2023 **Kyoto University**
Travel support for attending TDA Week *August 2023*

Travel Grants for CG Week 2023 **UT Dallas**
Travel support for attending CG Week *July 2023*

Travel Funding for AMS MRC **Java Center, NY**
Travel support for attending Mathematics Research Community *June 2022*

Pi Mu Epsilon	**College of the Holy Cross**
Mathematical Honors Society	*Inducted 2020*
MAA Poster Session Outstanding Poster Award	**Joint Mathematics Meeting**
Awarded to recognize best posters in MAA Undergraduate Poster Session	*January 2019*
The Beethoven Prize	**College of the Holy Cross**
Awarded to an outstanding music major	*May 2020*

SERVICE AND OUTREACH

Fellow, Mathematics Outreach Seminar and Training (MOST) Program	**New York, NY**
National Museum of Mathematics	*July, 2023*
Engineering K-12 Outreach Fellow, College of the Engineering	**East Lansing, MI**
Michigan State University	*August, 2023 - present*
Graduate Student Liaison/Vice President, Department of CMSE	**East Lansing, MI**
Michigan State University	*September 2021 - August 2023*
Student Representative, CMSE Hiring Committee	**East Lansing, MI**
Michigan State University	*October 2021 - March 2022*
Co-Chair, Department of Music Student Advisory Committee	**Worcester, MA**
College of the Holy Cross	*April 2018 - April 2020*
Program Coordinator, International Student Orientation	**Worcester, MA**
College of the Holy Cross	*Fall 2017, 2018, 2019*
Workshop Leader, The Arts in Practice	**Worcester, MA**
Burncoat High School	*October 2019*

REVIEW AND REFEREE

- International Symposium of Computational Geometry (SoCG) (Subreviewer)	*2023*
- Conference and Workshop on Neural Information Processing Systems (NeurIPS)	*2022-2024*
- Journal of Applied and Computational Topology	*2023*

CONFERENCE AND WORKSHOP ORGANIZATION

MSU TDA Seminar	**East Lansing, MI**
Organize weekly seminars at MSU	*August 2024 - present*
Workshop on Directional Transform	**Athens, Greece**
International Symposium of Computational Geometry (SoCG)	*June 2024*

PROFESSIONAL EXPERIENCE

Research Analyst Intern	**Shanghai, China**
Caitong Fund Management Company	*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, LaTeX, SQL, MATLAB, OpenMP/MPI, Magma, Maple, Fortran
Interests: Piano and Flute Performance, Cooking and Gastronomy
Languages: Fluent Mandarin and English, Conversational French and Korean