

# WEIXIAO WANG

Homepage: [weixiao-wang9.github.io](https://weixiao-wang9.github.io) — GitHub: [github.com/weixiao-wang9](https://github.com/weixiao-wang9)

Email: [wwang987@uwo.ca](mailto:wwang987@uwo.ca) — Location: London, Ontario, Canada

## EDUCATION

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**Western University (UWO)** 2026 (expected)

M.Sc. in Applied Mathematics

*Master Project: Topological Data Analysis & Machine Learning; persistent homology, active learning, representation geometry.*

**Georgia Institute of Technology** 2026 (expected)

M.S. in Computer Science

*Specialization: Artificial Intelligence. Relevant areas: machine learning, High-Performance-Computing.*

**University of Pennsylvania** 2024 – (on leave)

M.S.E. in Data Science

*Focus: large-scale ML/data systems, ML engineering.*

**University of California, Santa Barbara** 2021 2023

B.S. in Applied Mathematics — B.A. in Statistics & Data Science

*Completed dual degree on an accelerated timeline; strong preparation in mathematics, statistics, and ML.*

## RESEARCH INTERESTS

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Topological data analysis and computational topology for machine learning; representation learning and geometry of latent spaces; uncertainty quantification and Bayesian methods; active learning and sample-efficient learning; learning theory and robust generalization.

## RESEARCH EXPERIENCE

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**Bayesian Rips Active Learning (BRAL)** 2024 – Present  
(Independent / Master Project)

- Developed a topology-aware active learning framework combining Bayesian uncertainty modeling with persistent homology computed over Vietoris–Rips filtrations.
- Designed acquisition strategies that incorporate topological summaries (e.g., persistence-based objectives) to improve rare-structure / rare-lineage discovery in high-dimensional data.
- Implemented end-to-end experimental pipeline (data, model training, querying loops, evaluation, visualization) in Python; integrated libraries such as PyTorch/GPyTorch and TDA toolkits (e.g., Gudhi/Ripsr).
- Evaluated on synthetic manifolds and benchmark datasets; performed sensitivity analyses and ablations to understand the effect of topology regularization and uncertainty estimation.

**Representation Geometry & Manifold Visualization Tools** 2024 – Present  
(Project)

- Studied geometric/topological evolution of learned representations (encoder/latent spaces) and how model choice affects topology preservation and deformation.
- Built interactive visualization dashboards to inspect embeddings, neighborhood graphs, and persistence diagrams during training and active learning iterations.
- Developed reproducible experiment tooling and reporting artifacts suitable for research communication (figures, tables, and write-ups).

## TEACHING EXPERIENCE

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Teaching Assistant, Department of Mathematics, Western University Sep 2025 – Present

- Supported tutorials/labs and held office hours; graded assignments and exams; provided feedback and problem-solving guidance.
- Courses supported include: Methods of Finite Mathematics; Mathematical Structures; Numerical Analysis; Computer Algebra.

## ACHIEVEMENTS

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Accelerated dual degree completion (UCSB)	<i>2023</i>
Teaching Assistantship (Mathematics, Western University)	<i>2025</i>
Graduate Researcher Fellowship (Mathematics, Western University)	<i>2025</i>

## SKILLS/HOBBIES

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<b>Programming Languages</b>	Python, C/C++, SQL, Bash
<b>ML/Scientific Computing</b>	PyTorch, GPyTorch, scikit-learn, NumPy, Pandas
<b>TDA / Geometry Tools</b>	Gudhi, Ripser, (optional: KeplerMapper/UMAP/Scanpy)
<b>Web/Engineering Tools</b>	Git, Linux, Docker, FastAPI, React, WebGL
<b>Hobbies</b>	(optional: replace) hiking, reading, language learning