

Weixiao Wang

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Email: wwang987@uwo.ca · Location: London, Ontario, Canada

Education

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

M.S.E. in Data Science (*transferred to pursue research focus in applied mathematics*)

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.

Publications

[1] **Bayesian Rips Active Learning: Topology-Aware Acquisition for Rare Lineages**

Weixiao Wang, Anibal M. Medina-Mardones

ICLR 2026 Workshop on Machine Learning for Genomics (MLGenX), Tiny Paper Track.

[\[OpenReview\]](#)

Research Experience

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/Ripser).
- 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

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

- Accelerated dual degree completion (UCSB) *2023*
- Teaching Assistantship (Mathematics, Western University) *2025*
- Graduate Researcher Fellowship (Mathematics, Western University) *2025*

Skills / Hobbies

Programming Languages	Python, C/C++, SQL, Bash
ML / Scientific Computing	PyTorch, GPyTorch, scikit-learn, NumPy, Pandas
TDA / Geometry Tools	Gudhi, Ripser, KeplerMapper, UMAP, Scanpy
Web / Engineering Tools	Git, Linux, Docker, FastAPI, React, WebGL
Hobbies	Hiking, reading, language learning