

WEIXIAO WANG

Homepage: weixiao-wang9.github.io — GitHub: github.com/weixiao-wang9

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

EDUCATION

Western University (UWO) M.Sc. in Applied Mathematics <i>Master Project: Topological Data Analysis & Machine Learning; persistent homology, active learning, representation geometry.</i>	2026 (expected)
Georgia Institute of Technology M.S. in Computer Science <i>Specialization: Artificial Intelligence. Relevant areas: machine learning, High-Performance-Computing.</i>	2026 (expected)
University of Pennsylvania M.S.E. in Data Science <i>Focus: large-scale ML/data systems, ML engineering.</i>	2024 – (on leave)
University of California, Santa Barbara B.S. in Applied Mathematics — B.A. in Statistics & Data Science <i>Completed dual degree on an accelerated timeline; strong preparation in mathematics, statistics, and ML.</i>	2021 2023

RESEARCH INTERESTS

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

Bayesian Rips Active Learning (BRAL) (Independent / Master Project)	2024 – Present
<ul style="list-style-type: none">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 (Project)	2024 – Present
<ul style="list-style-type: none">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, (optional: KeplerMapper/UMAP/Scanpy)
Web/Engineering Tools	Git, Linux, Docker, FastAPI, React, WebGL
Hobbies	(optional: replace) hiking, reading, language learning