Yu (Demi) Qin

Updated October 23, 2025

Email: yqin2@tulane.edu
Website: https://demiqin.github.io
Phone: (504) 452–0205
Location: Washington, DC

Education

Tulane University — New Orleans, LA
Ph.D., Computer Science — 2018 – 2025
Advisors: Brian Summa, Carola Wenk
Dissertation: Metric Learning on Topological Descriptors

Chongqing University — Chongqing, China
B.S., Computer Science — 2014 – 2018
Graduated top of class (Rank 1/145)

Work experience

NREL, Data Analysis & Visualization — Golden, CO
Research Scientist — Jun 2025 – Present
Developing advanced machine learning models to generate realistic, constraint-aware systems for energy-related fields, in collaboration with power system and distribution engineers, and climate scientists.
Building critical DOE-mission capability in the Insight Center for large-scale visualization and analytics.

Hitachi America Ltd., IoT Edge Lab — Santa Clara, CA
Research Intern — Jul 2023 – Feb 2024
Developed the first temporal GNN model to jointly learn internal production functions and forecast transactions in supply chain networks, in collaboration with Stanford University; Improved production function inference by 6–50% and transaction forecasting by 11–62% on real and synthetic data; published at AAAI 2025 (oral) and presented at Stanford Graph Learning Workshop.

NREL, Data Analysis & Visualization — Golden, CO
Graduate Intern — Jun 2022 – Aug 2024
Developed efficient methods for detecting extreme climate events using TDA on temporal-spatial climate data, reducing detection time from quadratic to linear complexity (10× speed-up). Published and presented at IEEE EnergyVis.

Honors and awards

Best Paper (Full Papers), IEEE VIS 2024 — 2024
Grace Hopper Celebration Scholar — 2023
National Scholarship (China) — 2017

Publications

[P1] Yu Qin. *Metric Learning on Topological Descriptors.* Tulane University ProQuest Dissertations & Theses

[P2] **Yu Qin**, Brittany Terese Fasy, Carola Wenk, Brian Summa. *Rapid and Precise Topological Comparison with Merge Tree Neural Networks.* IEEE Transactions on Visualization and Computer Graphics (IEEE VIS 2024).
DOI: 10.1109/TVCG.2024.3456395 — arXiv: 2404.05879 — Project: MTNN

[P3] Serina Chang, Zhiyin Lin, Benjamin Yan, Swapnil Bembde, Qi Xiu, Chi Heem Wong, **Yu Qin**, Frank Kloster, Xi Luo, Raj Palleti, Jure Leskovec. *Learning Production Functions for Supply Chains with Graph Neural Networks.* AAAI 2025 (oral).
DOI: 10.1609/aaai.v39i27.35004 — arXiv: 2407.18772 — Code: GitHub

[P4] Erin Chambers, Brittany Terese Fasy, Benjamin Holmgren, and **Yu Qin**. *A Geometric Distance for Morse–Smale Complexes.* ATMCS 2025.
OpenReview: 3KlWnpZTCO

[P5] Joshua Dorrington, Sushovan Majhi, Atish Mitra, James Moukheiber, **Yu Qin**, Jacob Sriraman, Kristian Strommen. *Topology of The Polar Vortex and Montana Weather.* ATMCS 2025.
arXiv: 2503.20743

[P6] Bernárdez, Guillermo, **Yu Qin**, et al. *ICML topological deep learning challenge 2024: Beyond the graph domain.* ICML 2024.
arXiv: 2409.05211

[P7] **Yu Qin**, Brittany Terese Fasy, Carola Wenk, Brian Summa. *Visualizing Topological Importance: A Class-Driven Approach.* Topological Data Analysis and Visualization (TopoInVis) 2023.
DOI: 10.1109/TopoInVis60193.2023.00016 — arXiv: 2309.13185

[P8] **Yu Qin**, Graham Johnson, Brian Summa. *Topological Guided Detection of Extreme Wind Phenomena: Implications for Wind Energy.* EnergyVis 2023.
DOI: 10.1109/EnergyVis60781.2023.00010 — Preprint: NREL/OSTI

[P9] **Yu Qin**, Brittany Terese Fasy, Carola Wenk, Brian Summa. *A Domain-Oblivious Approach for Learning Concise Representations of Filtered Topological Spaces for Clustering.* IEEE Transactions on Visualization and Computer Graphics (IEEE VIS 2021).
DOI: 10.1109/TVCG.2021.3114872 — Project: PD-Hash

[P10] Brittany Terese Fasy, **Yu Qin**, Brian Summa, Carola Wenk. *Comparing Distance Metrics on Vectorized Persistence Summaries.* NeurIPS 2020 Workshop on Topological Data Analysis and Beyond.
OpenReview: X1bxKJo5_qL

[P11] Yanjun Liu, Junjian Huang, **Yu Qin**, Xinbo Yang. *Finite-Time Synchronization of Complex-Valued Neural Networks with Finite-Time Distributed Delays.* Neurocomputing, 416:152–157, 2020.
DOI: 10.1016/j.neucom.2019.01.114

[P12] Yanjun Liu, **Yu Qin**, Junjian Huang, Tingwen Huang, Xinbo Yang. *Finite-Time Synchronization of Complex-Valued Neural Networks with Multiple Time-Varying Delays and Infinite Distributed Delays.* Neural Processing Letters, 2019.
DOI: 10.1007/s11063-018-9958-6

Invited Talks

Learning to Compare Complex Shapes in Data — 100× Faster with Merge Tree Neural Networks Aug 2025
ELLIS UniReps Speaker Series (flash talk).

Learning Topological Signatures: TDA and ML at Scale Oct 2025
AMS Special Session: Advances in Applied Topology and TDA.

Rapid and Precise Topological Comparison with Merge Tree Neural Networks (Best Paper) Oct 2024
IEEE VIS 2024 (Full Papers Opening).

Visualizing Topological Importance: A Class-Driven Approach Oct 2023
TopoInVis 2023.

Topological Guided Detection of Extreme Wind Phenomena Oct 2023
EnergyVis 2023.

Services

Program Committee

Association for the Advancement of Artificial Intelligence (AAAI) 2026
IEEE TopoInVis 2026
NeurIPS Workshop on Symmetry and Geometry in Neural Representations (NeurReps) 2023 – 2025

Reviewer

IEEE TVCG; VIS; EnergyVis; TopoInVis; VISxAI; ICMI; AAAI; NeurReps; Multimedia Systems; Research in Computational Topology

Mentoring & Volunteer

Mentor, Women in Machine Learning (WiML) 2022 – 2023
Student Volunteer, IEEE VIS 2021 – 2023
Student Volunteer, NeurIPS 2022