

Quang Truong

✉ truongc4@msu.edu | 🏠 quang-truong.github.io | 📄 quang-truong

Research Interests

Machine Learning, Relational Deep Learning, Graph Representation Learning, Computer Vision

Education

Michigan State University

Ph.D. in Computer Science

East Lansing, MI

Aug. 2024 - Present

Dartmouth College

M.S. in Engineering Sciences

Hanover, NH

Sep. 2022 - Jun. 2024

Research Experience

DSE Lab, Michigan State University

Ph.D. Student (Advisor: **Jiliang Tang**)

East Lansing, MI

Aug. 2024 - Present

- Leverage Graph Neural Networks (GNNs) to learn relations between entities in relational databases.

pyt-team

Contributor

Remote

Aug. 2023 - Oct. 2023

- Initiated the development of Path Complex package for TopoNetX library, which facilitates machine learning on topological domains extended from graphs.

LISP Lab, Dartmouth College

M.S. Student (Advisor: **Peter Chin**)

Hanover, NH

Sep. 2022 - Jun. 2024

- Pioneered a novel branch of Topological Deep Learning (TDL) that relies on simple paths, which allows better generalization capability through the lens of Weisfeiler-Lehman tests.
- Developed Path Isomorphism Network, a state-of-the-art TDL model, which achieves remarkable results on PROTEINS (78.8%), NCI1 (85.1%), NCI109 (84.0%), and IMDB-B (76.6%).

Vision Lab, University of Illinois at Chicago

Research Intern (Advisor: **Wei Tang**)

Remote

May 2021 - Feb. 2022

- Developed a context-aware 3D object detection architecture capturing object-wise and object-context relationships.
- Enhanced model performance by incorporating contrastive learning techniques to align embeddings of different views.

ML Lab, Texas Christian University

Undergraduate Research Assistant (Advisor: **Bo Mei**)

Fort Worth, TX

May 2019 - May 2021

- Designed a Vehicle Re-identification pipeline empowered by Generative Adversarial Networks (GANs) for adaptive domain learning.
- Derived a novel filtering algorithm that substantially reduces the number of training samples without performance trade-offs.

Selected Publications

‡ indicates equal contribution.

- [1] TopoX: A Suite of Python Packages for Machine Learning on Topological Domains
Mustafa Hajji[‡], Mathilde Papillon[‡], Florian Frantzen[‡], ... **Quang Truong**, and ... Nina Miolane. **2024a**
Under review at the Journal of Machine Learning Research (JMLR).
- [2] Weisfeiler and Lehman Go Paths: Learning Topological Features via Path Complexes
Quang Truong and Peter Chin. **2024b**
AAAI'24: The 38th Annual AAAI Conference on Artificial Intelligence.
- [3] Not All Data Matters: An Efficient Approach to Multi-Domain Learning in Vehicle Re-Identification
Quang Truong and Bo Mei. **2021**
ITSC'21: The 24th IEEE International Conference on Intelligent Transportation Systems.

Skills

Programming Python, C/C++, Java, SQL, R, MatLab

Machine Learning Pytorch, Pytorch Geometric, Pytorch Frame, NetworkX, TopoX, Pytorch Lightning, Hydra, WandB, Scikit-learn, Tensorflow, Keras, Matplotlib, Numpy, Pandas

DevOps Docker, Singularity, Pytest

Presentations

Invited Presentations

- Topologically-driven Neural Networks, *HPCC Special Seminar: Decoding Computational Challenges, the Advanced Institute of Interdisciplinary Science and Technology - HCMUT, VNU-HCM*. **2024**
- Domain-invariant Network for Vehicle Re-identification, *Annual Industrial Board Meeting of TCU Department of Computer Science*. **2020**

Conference Presentations

- Weisfeiler and Lehman Go Paths: Learning Topological Features via Path Complexes, *AAAI'24: The 38th Annual AAAI Conference on Artificial Intelligence*. **2024**
- Not All Data Matters: An Efficient Approach to Multi-Domain Learning in Vehicle Re-identification, *ITSC'21: The 24th IEEE International Conference on Intelligent Transportation Systems*. **2021**

Teaching Experience

Dartmouth College

- Teaching Assistant, *ENGS 96: Mathematics for Machine Learning*. **Winter 2024**

Honors

Grants

- Research Grant for Domain-invariant Network for Vehicle Re-identification (\$1471), *TCU SERC Undergraduate Research Grant*. **2020**
- Research Grant for AI-2-Go (\$1500), *TCU SERC Undergraduate Research Grant*. **2019**
- Research Grant for Housing Price Prediction (\$1500), *TCU SERC Undergraduate Research Grant*. **2019**

Awards

- VEF Fellow, *VEF 2.0 Program, VEF Fellows and Scholars Association*. **2021**
- Vingroup Scholarship Recipient, *Master's & Ph.D. Scholarship Program, VinUniversity*. **2021**
- Best Undergraduate Research Poster, *TCU Student Research Symposium [URL]*. **2019, 2021**
- TCU Scholar, *Texas Christian University*. **2020, 2021**
- Dean's List, *Texas Christian University*. **2019-2021**
- Bronze Medal, *ACM-ICPC South Central USA Regional Contest [URL]*. **2019**
- 1st Prize, *Calculus Bee [URL]*. **2019**
- Transfer Faculty Scholarship (\$196,000 for four years), *Texas Christian University*. **2019**
- President's Scholar, *Mississippi State University*. **2017, 2018**
- Freshmen Academic Excellence Scholarship (\$54,000 for four years), *Mississippi State University*. **2017**

Relevant Coursework

Engineering	Signal Processing, Fourier Transforms and Complex Variables, Statistical Methods in Engineering
Computer Science	Artificial Intelligence, Multi-modalities Generative AI, Network Science and Complex Systems, Deep Learning, Data Mining and Visualization, Analysis of Algorithm, Operating Systems, Database Systems
Mathematics	Mathematics for Machine Learning, Game Theory, Applied Linear Algebra, Probability, Statistics, Discrete Mathematics, Calculus