Puja **Trivedi**

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Education

University of Michigan, Ann Arbor — *Ann Arbor, MI*

PhD. in Computer Science and Engineering — *Aug. 2019 - Dec. 2024*

- Advisor: Prof. Danai Koutra, Graph Mining and Exploration at Scale (GEMS) Lab
- Self Supervised Graph Representation Learning, Safe Model Adaptation, Uncertainty Quantification

University of Maryland, Baltimore County — *Baltimore, MD*

B.S. in Computer Science, B.S. in Mathematics — *2019*

Research Interests

I am broadly interested in understanding how representation learning can be effectively and reliably performed for graph data, potentially for use in scientific problems. Some of my previous work has focused on understanding the behavior of augmentations in *graph self-supervised learning*, designing *finetuning protocols* for better model adaptation, and developing a light-weight training strategy for improving *uncertainty estimation* on GNN-based tasks. Presently, I am interested in how LLM world-knowledge can be leveraged to improve performance on graph-based tasks and how graph diffusion models can used to edit or refine graphs.

Selected Publications

Conferences

[10] "PAGER: A Framework for Failure Analysis of Deep Regression Models". Jayaraman J. Thiagarajan, Vivek Narayanaswamy, **Puja Trivedi**, and Rushil Anirudh. *Proc. Int. Conf. on Machine Learning (ICML)*, 2024

[9] "A Stochastic Centering Framework for Improving Calibration in Graph Neural Networks". **Puja Trivedi**, Mark Heimann, Rushil Anirudh, Danai Koutra, and Jayaraman J. Thiagarajan. *Proc. Int. Conf. on Learning Representations (ICLR)*, 2024

[8] "On Estimating Link Prediction Uncertainty using Stochastic Centering". **Puja Trivedi**, Danai Koutra, and Jayaraman J Thiagarajan. *Proc. Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP)*, 2024

[7] "Editing Partially Observable Networks via Graph Diffusion Models". **Puja Trivedi**, Ryan A Rossi, David Arbour, Tong Yu, Franck Dernoncourt, Sungchul Kim, Nedim Lipka, Namyong Park, Nesreen K. Ahmed, and Danai Koutra. *Proc. Int. Conf. on Machine Learning (ICML)*, 2024

[6] "A Closer Look At Scoring Functions And Generalization Prediction". **Puja Trivedi**, Danai Koutra, and Jayaraman J Thiagarajan. *Proc. Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP)*, 2023

[5] "A Closer Look at Model Adaptation using Feature Distortion and Simplicity Bias". **Puja Trivedi**, Danai Koutra, and Jayaraman J. Thiagarajan. *Proc. Int. Conf. on Learning Representations (ICLR)*, 2023. spotlight, top 25%

[4] "How do Quadratic Regularizers Prevent Catastrophic Forgetting: The Role of Interpolation". Ekdeep Singh Lubana, **Puja Trivedi**, Danai Koutra, and Robert P. Dick. *Proc. Conf. on Lifelong Learning Agents, (CoLLAs)*, 2022

[3] "Analyzing Data-Centric Properties for Graph Contrastive Learning". **Puja Trivedi**, Ekdeep Singh Lubana, Mark Heimann, Danai Koutra, and Jayaraman J. Thiagarajan. *Proc. Adv. in Neural Information Processing Systems (NeurIPS)*, 2022

[2] "Augmentations in Graph Contrastive Learning: Current Methodological Flaws & Towards Better Practices". **Puja Trivedi**, Ekdeep Singh Lubana, Yujun Yan, Yaoqing Yang, and Danai Koutra. *Proc. The WebConf (Formerly WWW)*, 2022

[1] "Leveraging the Graph Structure of Neural Network Training Dynamics". Fatemeh Vahedian, Ruiyu Li, **Puja Trivedi**, Di Jin, and Danai Koutra. *Proc. of ACM Int. Conf. on Information & Knowledge Management (CIKM)*, 2022

Preprints

[1] "Large Language Model Guided Graph Clustering". **Puja Trivedi**, Nurendra Choudhary, Edward W Huang, Vassilis N. Ioannidis, Karthik Subbian, and Danai Koutra. *Preprint*, 2024

Experience

Amazon (Search and Explore Team) — *Palo Alto, CA*

Applied Scientist Intern — *Oct. 2023 - Dec. 2023*

- LLM Guided Graph Clustering Through Active Learning
- Mentors: Nurendra Choudary, Vassilis N. Ioannidis, Eddie W. Huang

Adobe, Research *San Jose, CA*

Research Scientist Intern *May 2023 - Aug 2023*

- Partially Observable Network Refinement Using Graph Diffusion Models
- Mentor: Ryan Rossi

Lawrence Livermore National Laboratories *Livermore, CA*

Research Intern *May 2021 - Aug 2022*

- Improving Uncertainty Quantification under Distribution Shifts on Graph Neural Networks Based Tasks
- Finetuning Protocols for Improved Safety and Generalization
- Mentor: Jayaraman J. Thiagarajan

Smart Information Flow Technologies *Minneapolis, MN*

Research Intern *2018, 2019*

- Using Bayesian models to Support Experimental Planning in Synthetic Biology
- Mentor: Robert P. Goldman

Reviewing

Conferences/Journals NeurIPS, ICLR, TKDD, Neurocomputing, ICASSP, WebConf

PC Member Posters and Demos Session @ CIKM, GLB @ WebConf, MLG @ KDD, DMLR @ ICML

Honors & Awards

2019 **Dwight F. Benton Doctoral Fellowship**

2019 **Phi Beta Kappa**

2019 **Outstanding Graduating Senior in Computer Science and Mathematics**

2015-19 **Meyerhoff Scholar**

2015-19 **National Security Agency Scholar**

Skills

Programming Python (most frequent), C++, Bash

DL Frameworks PyTorch (most frequent), Tensorflow, Pytorch-Geometric, DGL