Curriculum Vitae — Qi Zhu

CONTACT INFORMATION

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Google Scholar:Qi Zhu

RESEARCH SUMMARY

The objective of my Ph.D. work is to understand and improve the ***out-of-distribution generalization*** of neural networks. In particular, my past work aims to seamlessly ***combining*** text and structured data with graph neural networks and pre-trained language models. Moving forward, I am fascinated by ***foundation models*** and also like to advance the robustness and safety of these models. My interests include, but are not limited to, topics such as robust prompt and instruction tuning, as well as enforcing fairness of pre-trained language model fine-tuning for cross-domain and long-tail data.

RESEARCH INTERESTS

Out-of-distribution Generalization, Domain Adversarial Training
Network Science, Geometric Deep Learning

EDUCATION

University of Illinois Urbana-Champaign

M.S., Computer Science Department, 2016 - 2018
Ph.D., Computer Science Department, 2018 - 2023

- Advisor: Prof. Jiawei Han

Zhejiang University

B.Eng., Computer Science Department, 2012.10 - 2016.6

- Advisor: Prof. Deng Cai
- GPA:3.87/4, top 5%

EXPERIENCE

Amazon Web Service(AWS) Inc. Aug 2023 to Present

- Applied Scientist, AWS AI
- Responsibility: Develop graph neural network with large language models

University of Illinois, Urbana-Champaign Aug 2016 to July 2023

- Research Assistant, Data Mining Group, Database and Information System (DAIS) Lab
- Thesis: *Exploring the Power of Text-Rich Graph Representation Learning*
- Committee: Jiawei Han, Hanghang Tong, Hari Sundaram, Bryan Perozzi
  - **shift-robust training** GNNs with biased training data
  - **collective training** of GNNs for new task generalization on knowledge graph
  - **graph-enhanced language model fine-tuning** for name disambiguation

Meta Platforms, Inc. May to Aug 2022

- Software Engineer Intern, Core ML Team
- Project: Efficient Pooling of Multi-channel User History Sequence in Recommendation

Google Inc. May to Aug 2020

- Research Intern, Google Research, mentor: Bryan Perozzi
- Project: Domain-shift Robust Graph Neural Networks
  - proposed Shift-Robust GNN (SR-GNN), designed to account for distributional differences between biased training data and a graph's true inference distribution, where we see that SR-GNN addresses at least ∼**40% of the negative effects** introduced by biased training data.

Amazon Inc. May to Aug 2019

- Applied Scientist Intern, Product Graph, mentor: Luna Dong

- Project: Collective Multi-type Entity Alignment Between Knowledge Graphs
  - jointly aligned multiple types of entities by leveraging supervision of different types collectively, which can achieve comparable results using only **10% of the supervision**.

Google Inc. May to Aug 2017

- Software Engineer Intern, Image Search
- Project: Co-click Related Images Pipeline and Co-click Embedding Signals
  - developed a new ranking feature based on embeddings derived from the network of users' co-clicks on images, which led to an increase in the user save rate during a live experiment.

Robotics Institute, Carnegie Mellon University Jun to Aug 2016

- Research Scholar, supervisor: Prof. Yaser Sheikh
- Project: Articulate Object Keypoint Detection and Pose Estimation Using Synthetic Data

Zhejiang University Dec 2013 to May 2016

- Research Assistant, State Key Lab of CAD&CG
- *Thesis*: Personalized Recommendation in Heterogeneous Social Network

Peer-Reviewed Publications (* equal contribution)

1. Shift-Robust Node Classification via Graph Adversarial Clustering
   Q. Zhu, C. Zhang, C. Park, C. Yang, J. Han
   GLFrontiers Workshop at Neural Information Processing Systems (NeurIPS), 2022
2. Shift-Robust GNNs: Overcoming the Limitations of Localized Graph Training Data
   Q. Zhu, N. Ponomareva, J. Han, B. Perozzi
   Neural Information Processing Systems (NeurIPS), 2021
3. Transfer Learning of Graph Neural Networks with Ego-graph Information Maximization
   Q. Zhu*, C. Yang*, Y. Xu, H. Wang, C. Zhang, J. Han
   Neural Information Processing Systems (NeurIPS), 2021
4. SUMDocS: Surrounding-aware Unsupervised Multiple Document Summarization
   Q. Zhu, F. Guo, J. Tian, Y. Mao, J. Han,
   SIAM International Conference on Data Mining (SDM), 2021
5. Collective Multi-type Entity Alignment Between Knowledge Graphs
   Q. Zhu, H. Wei, B. Sisman, D. Zheng, C. Faloutsos, X. Dong, J. Han
   International World Wide Web Conference (WWW), 2020
6. Integrating Local and Global Information for Open Information Extraction
   Q. Zhu, X. Ren, J. Shang, Y. Zhang, F. Xu, J. Han
   International Conference on Web Search and Data Mining (WSDM), 2019.
7. Easing Embedding Learning by Comprehensive Transcription of Heterogeneous Information Networks
   Y. Shi*, **Q. Zhu***, F. Guo, C. Zhang, J. Han
   International Conference on Knowledge Discovery & Data Mining (KDD), 2018.
8. Patton: Language Model Pretraining on Text-Rich Networks
   B. Jin, W. Zhang, Y. Zhang, Y. Meng, X. Zhang, **Q. Zhu**, J. Han
   The 61st Annual Meeting of the Association for Computational Linguistics (ACL), 2023
9. Heterformer: A Transformer Architecture for Node Representation Learning on Heterogeneous Text-Rich Networks
   B. Jin, Y. Zhang, **Q. Zhu**, J. Han
   International Conference on Knowledge Discovery & Data Mining (KDD), 2023.
10. The Effect of Metadata on Scientific Literature Tagging: A Cross-Field Cross-Model Study
    Y. Zhang, B. Jin, **Q. Zhu**, Y. Meng, J. Han
    International World Wide Web Conference (WWW), 2023

11. Unsupervised Differentiable Multi-aspect Network Embedding
Chanyoung Park, C. Yang, **Q. Zhu**, H. Yu, J Han
International Conference on Knowledge Discovery & Data Mining (KDD), 2020

12. Facet-Aware Evaluation for Extractive Summarization
Y. Mao, L. Liu, **Q. Zhu**, X. Ren, J. Han
The 58th Annual Meeting of the Association for Computational Linguistics (ACL), 2020

13. Discovering Hypernymy in Text-Rich Heterogeneous Information Network by Exploiting Context Granularity
Y. Shi, J. Shen, Y. Li, N. Zhang, X. He, Z. Lou, **Q. Zhu**, M. Walker, M. Kim, J. Han
International Conference on Information and Knowledge Management(CIKM), 2019

14. Task-guided pair embedding in heterogeneous network
C. Park, D. Kim, **Q. Zhu**, J. Han, H. Yu
International Conference on Information and Knowledge Management(CIKM), 2019

15. ASPEM: Embedding Learning by Aspects in Heterogeneous Information Networks
Y. Shi, H. Gui, **Q. Zhu**, L. Kaplan, J. Han,
SIAM International Conference on Data Mining (SDM), 2018

16. Heterogeneous Supervision for Relation Extraction: A Representation Learning Approach
L. Liu*, X. Ren*, **Q. Zhu**, S. Zhi, H. Gui, H. Ji, J. Han,
Conference on Empirical Methods in Natural Language Processing (EMNLP), 2017

Pre-print

1. Explaining and Adapting Graph Conditional Shift (arXiv:2306.03256)
Q. Zhu, Y. Jiao, N. Ponomareva, J. Han, B. Perozzi

2. Augmentation-free graph contrastive learning (arXiv:2204.04874)
H. Wang, J. Zhang, **Q. Zhu**, W. Huang

3. Expert finding in heterogeneous bibliographic networks with locally-trained embeddings (arXiv:1803.03370)
H. Gui*, **Q. Zhu***, L. Liu, A. Zhang, J. Han

Patent

1. Systems and methods for articulated pose estimation
Z Cao, **Q. Zhu**, Y Sheikh, SE Chelian
US Patent 10,535,155

Talks

1. Designing Robust Graph Neural Network against Distribution Shift
KAIST, Mar 2023

2. Overcoming the Limitations of Localized Graph Training data
Graph Intelligence Sciences team at Microsoft MSAI, May 2022

3. Designing Robust Graph Neural Network against Distribution Shift
DGL Team at Amazon, May 2022

Awards & Scholarships

- Amazon Machine Learning Research Award, 2020 Q1
- Project: Empower Heterogenous Information Network with Label Efficient Graph Representation Learning
- 3rd place in WSDM Cup 2017
- Best Poster Honorable Mention (WWW 2018)

Professional Services

- PC Member: NeurIPS, ICLR, ICML, ACL, EMNLP, KDD, WWW, WSDM, AAAI, IJCAI, CIKM

Programming Skills

- Programming Languages: Python, C/C++, Objective-C, MATLAB, UNIX shell scripting
- Machine Learning Libraries: PyTorch, DGL, PyTorch Geometric, Hugging Face