Yuying Zhao

CONTACT INFORMATION	Office: A4022 Sony Building 1400 18th Ave S Nashville, TN 37212 E-mail: yuying.zhao@vanderbilt.edu	Personal Homepage: https://yuyingzhao.github.io LinkedIn: https://www.linkedin.com/in/yy-zhao/ GitHub: https://github.com/YuyingZhao Google Scholar: xyTYlX0AAAAJ

BIOGRAPHY

Yuying is a PhD Candidate in Computer Science at Vanderbilt University under the supervision of Dr. Tyler Derr and a member of the Network and Data Science (NDS) lab. She completed her BS and MS in Computer Science from Huazhong University of Science and Technology in 2018 and 2021, respectively, where she received the university's "Outstanding Graduate" award for both her BS degree and MS degree. Her research interests lie in Responsible and Trustworthy AI, focusing on learning beyond utility perspectives, including fairness, explainability, and diversity. Her work spans various applications, such as recommender systems, graph neural networks, large language models, and traditional ML models.

For more detailed information, please see below or visit her website at https://yuyingzhao.github.io.

EDUCATION

Vanderbilt University

Doctor of Philosophy (**Ph.D.**) Student in Computer Science	2021 – Present

Huazhong University of Science and Technology (HUST)

Master of Science (**M.S.**) in Computer System Architecture	2018 – 2021
Bachelor of Science (**B.S.**) in Computer Science	2014 – 2018

RESEARCH EXPERIENCE

Network and Data Science Lab, Vanderbilt University
PhD Student — Aug 2021 – Present
- Research areas: Trustworthy AI, Responsible AI, Recommender Systems
- Relevant coursework: Geometric Deep Learning, Machine Learning
- Advisor: Dr. Tyler Derr

Trustworthy AI Team, Visa Research
Research Scientist Intern — May 2024 – Aug 2024
- Project: Mitigating data sparsity and imbalance issues in recommender systems
- Mentors: Dr. Yiwei Cai, Dr. Xiaodong Yang, Dr. Huiyuan Chen

Artificial Intelligence Team, Visa Research
Research Scientist Intern — May 2023 – Aug 2023
- Project: A Multi-Interest Learning Paradigm Towards Improving User Interest Diversity Fairness
- Mentors: Dr. Minghua Xu, Dr. Huiyuan Chen

Cluster and Grid Computing Lab, HUST
Master Student — Sep 2018 – Jun 2021
- Research areas: Graph Algorithms, Graph Mining, Graph Database
- Advisors: Dr. Pingpeng Yuan, Dr. Hai Jin

SCHOLARSHIPS & AWARDS

- AAAI Student Scholarship — Dec 2023
  for our paper "Leveraging Opposite Gender Interaction Ratio as a Path Towards Fairness in Online Dating Recommendations Based on User Sexual Orientation" in AAAI'24
- KDD Student Travel Award — Jul 2023
  for KDD blog featuring The Shifting Landscape of Gender in STEM and our paper "Fair Online Dating Recommendations for Sexually Fluid Users via Leveraging Opposite Gender Interaction Ratio" in Workshop on Mining and Learning with Graphs (MLG) at KDD'23

- Most Influential WWW'23 Papers by Paper Digest (as co-author)   Sep 2023
  for our paper "Collaboration-Aware Graph Convolutional Network for Recommender Systems"
- Most Influential CIKM'22 Papers by Paper Digest (as co-author)   Sep 2023
  for our paper "Imbalanced Graph Classification via Graph-of-Graph Neural Networks"
- Vanderbilt's C. F. Chen Best Paper Runner-up Award   May 2023
  in Computer Science based on our AAAI'23 paper
  "Fairness and Explainability: Bridging the Gap Towards Fair Model Explanations"
- SDM Student Travel Award   Mar 2023
  for Doctoral Forum "Learning Beyond Utility: Fairness, Explainability, Diversity" in SDM'23
- AAAI Student Scholarship   Dec 2022
  for our paper "Fairness and Explainability: Bridging the Gap" in AAAI'23
- KDD Student Travel Award   Jul 2022
  for our paper "Improving Fairness in Graph Neural Networks via Mitigating Sensitive Attribute Leakage" (as co-author) in KDD'22
- SDM Student Travel Award   Mar 2022
  for Doctoral Forum "Improving Fairness via Fair Explanation" in SDM'22
- Free Conference Registration Awardee to attend ICML'21   2021
- ICWSM Student Scholarship to attend ICWSM'21   2021
- IBM Fellowship from Vanderbilt University   Aug 2021
- "Outstanding Graduate" Award for master degree from HUST   Jun 2021
- The First Prize Scholarship from HUST   2018
- "Outstanding Graduate" Award for bachelor degree from HUST   Jun 2018

PUBLICATIONS   Please note * denotes co-first authors.

Conference Papers (acceptance based on peer review of full paper):

[C13] Xueqi Cheng, Yu Wang, Yunchao (Lance) Liu, **Yuying Zhao**, Charu C. Aggarwal, Tyler Derr. Edge Classification on Graphs: New Directions in Topological Imbalance. In Proceedings of the 18th ACM International Conference on Web Search and Data Mining (WSDM), Hannover, Germany, March 10-14, 2025. (acceptance rate 17.3%)

[C12] Anne Tumlin, Diego Manzanas Lopez, Preston Robinette, **Yuying Zhao**, Tyler Derr, Taylor Johnson. FairNNV: The Neural Network Verification Tool For Certifying Fairness. In Proceedings of the 5th ACM International Conference on AI in Finance, Brooklyn, NY, USA, November 14-17, 2024. (acceptance rate unknown)

[C11] Yu Wang, Nedim Lipka, Ruiyi Zhang, Alexa Siu, **Yuying Zhao**, Bo Ni, Xin Wang, Ryan Rossi, and Tyler Derr. Augmenting Textual Generation via Topology Aware Retrieval. In Proceedings of the 33rd ACM International Conference on Information and Knowledge Management (CIKM), Boise, ID, USA, October 21-25, 2024. (acceptance rate 23%)

[C10] Longlong Lin, Yunfeng Yu, Zihao Wang, Zeli Wang, **Yuying Zhao**, Zhao Jin, Tao Jia. PSNE: Spectral Sparsification Algorithms for Scaling Network Embedding. In Proceedings of the 33rd ACM International Conference on Information and Knowledge Management (CIKM), Boise, ID, USA, October 21-25, 2024. (acceptance rate 23%)

[C09] **Yuying Zhao**, Minghua Xu, Huiyuan Chen, Yuzhong Chen, Yiwei Cai, Rashidul Islam, Yu Wang†, Tyler Derr. Can One Embedding Fit All? A Multi-Interest Learning Paradigm Towards Improving User Interest Diversity Fairness. In Proceedings of the ACM Web Conference (TheWebConf), Singapore, May 13-17, 2024. (acceptance rate 20.2%)

[C08] Yu Wang, **Yuying Zhao**, Yi Zhang, Tyler Derr. Collaboration-Aware Graph Neural Network for Recommender Systems. In Proceedings of the ACM Web Conference (TheWebConf), Austin, TX USA, April 30- May 4, 2023. (acceptance rate 19.2%)

[C07] Yu Wang, Tong Zhao, **Yuying Zhao**, Yunchao Liu, Xueqi Cheng, Neil Shah, Tyler Derr. A Topological Perspective on Demystifying GNN-Based Link Prediction Performance. In Proceedings of the 12th International Conference on Learning Representations (ICLR), Vienna, Austria, May 7-11, 2024. (acceptance rate 31%)

[C06] **Yuying Zhao**, Yu Wang, Yi Zhang, Pamela Wisniewski, Charu Aggarwal, and Tyler Derr. Leveraging Opposite Gender Interaction Ratio as a Path Towards Fairness in Online Dating Recommendations Based on User Sexual Orientation. In Proceedings of the 38th AAAI Conference on Artificial Intelligence (AAAI), Vancouver, CA, February 20-27, 2024. (acceptance rate 24.2% (AI for Social Impact special track))

[C05] **Yuying Zhao**, Yu Wang, Tyler Derr. Fairness and Explainability: Bridging the Gap Towards Fair Model Explanations. In Proceedings of the 37th AAAI Conference on Artificial Intelligence (AAAI), Washington, DC, USA, February 7-14, 2023. (acceptance rate 19.6%)

[C04] Yu Wang, **Yuying Zhao**, Neil Shah, Tyler Derr. Imbalanced Graph Classification via Graph-of-Graph Neural Network. In Proceedings of the 31th ACM International Conference on Information and Knowledge Management (CIKM), Atlanta, GA, USA, October 17-21, 2022. (acceptance rate 23.3%)

[C03] Xinmeng Zhang[*], **Yuying Zhao**[*], Chao Yan, Tyler Derr, and You Chen. Inferring EHR Utilization Workflows through Audit Logs. AMIA Annual Symposium Proceedings. Vol. 2022. American Medical Informatics Association, Washington D.C., USA, November 5-9, 2022. (acceptance rate unknown)

[C02] Yu Wang, **Yuying Zhao**, Yushun Dong, Huiyuan Chen, Jundong Li, Tyler Derr. Improving Fairness in Graph Neural Networks via Mitigating Sensitive Attribute Leakage. In Proceedings of the 28th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD), Washington D.C., USA, August 14-18, 2022. (acceptance rate 14.9% (research track))

[C01] Xiang Kang, **Yuying Zhao**, Pingpeng Yuan, and Hai Jin. Grace: An Efficient Parallel SPARQL Query System over Large-Scale RDF Data. In 2021 IEEE 24th International Conference on Computer Supported Cooperative Work in Design (CSCWD), Dalian, China, May 5-7, 2021. (acceptance rate unknown)

Journal Papers:

[J04] Yi Zhang[*], **Yuying Zhao**[*], Zhaoqing Li, Xueqi Cheng, Yu Wang, Olivera Kotevska, Philip S. Yu, and Tyler Derr. A Survey on Privacy in Graph Neural Networks: Attacks, Preservation, and Applications. IEEE Transactions on Knowledge and Data Engineering (TKDE), 2024. (impact factor 8.9)

[J03] **Yuying Zhao**, Yu Wang, Yunchao Liu, Xueqi Cheng, Charu Aggarwal, and Tyler Derr. Fairness and Diversity in Recommender Systems: A Survey. ACM Transactions on Intelligent Systems and Technology (TIST), 2024. (impact factor 7.2)

[J02] Yunfei Hu[*], **Yuying Zhao**[*], Curtis T. Schunk, Yingxiang Ma, Tyler Derr, and Xin Maizie Zhou. ADEPT: Autoencoder with Differentially Expressed Genes and Imputation for a Robust Spatial Transcriptomics Clustering. iScience (also accepted and presented at RECOMB-Seq), 2023. (impact factor 4.6)

[J01] **Yuying Zhao**, Yunfei Hu, Pingpeng Yuan, and Hai Jin. Maximizing Influence Over Streaming Graphs with Query Sequence. Data Science and Engineering, 2021. (impact factor 5.1)

Workshop Papers:

[W03] **Yuying Zhao**, Yu Wang, Yi Zhang, Pamela Wisniewski, Charu Aggarwal, Tyler Derr. "Fair Online Dating Recommendations for Sexually Fluid Users via Leveraging Opposite Gender Interaction Ratio". Workshop on Mining and Learning with Graphs (MLG) at KDD, 2023.

[W02] **Yuying Zhao**. Learning Beyond Utility: Fairness, Explainability, Diversity. International Conference on Data Mining (SDM) Doctoral Forum, SIAM, 2023.

[W01] **Yuying Zhao**. Improving Fairness via Fair Explanation. International Conference on Data Mining (SDM) Doctoral Forum, SIAM, 2022.

Preprints:

[P03] Xueqi Cheng, Catherine Yang, **Yuying Zhao**, Yu Wang, Hamid Karimi, Tyler Derr. A Comprehensive Analysis of Social Tie Strength: Definitions, Prediction Methods, and Future Directions. arXiv preprint arXiv:2410.19214 2024.

[P02]   Xiaodong Yang, Huiyuan Chen, Yuchen Yan, Yuxin Tang, **Yuying Zhao**, Eric Xu, Yiwei Cai, Hanghang Tong. Simplifying Cross-Entropy Loss for Collaborative Filtering, 2024 (under review). arXiv preprint arXiv:2406.16170 2024.

[P01]   Leyao Wang, Yu Wang, Bo Ni, **Yuying Zhao**, Tyler Derr. Large Language Model-based Augmentation for Imbalanced Node Classification on Text Attributed Graphs. arXiv preprint arXiv:2410.16882 2024.

MENTORING   **Network and Data Science Lab**, Vanderbilt University

Ph.D. Students
- Bo Ni, Ph.D. Computer Science   Spring 2024 – Present
  -Research topics: Trustworthy in Retrieval Augmented Generation (RAG)

- Anne Tumlin, Ph.D. Computer Science   Fall 2023 – Present
  -Research topics: Fairness verification

- Xueqi Cheng, Ph.D. Computer Science   Fall 2023 – Present
  -Research topics: Edge-centric analysis in graphs

M.S. Students
- Fanhao Zhou, M.S. Computer Science,   Spring 2024 – Present
  -Research topic: Improved online user retention understanding/prediction

B.S. Students
- Leyao (Laura) Wang, B.S. Computer Science & Mathematics   Fall 2023 – Present
  -Research topic: Completing missing reviews for recommendation

Former M.S. Students
- Catherine Yang, B.S. Computer Science, M.S. Computer Science   Fall 2023 – Spring 2024
  -KDD'23 Undergraduate Consortium - The Friendship Paradox: An Analysis on Signed Social Networks with Positive and Negative
  - Next Position: Software Engineer at Microsoft

TALKS   **Guest Lectures**:

[L03]   Fairness in Recommendation   Feb 2024
CS 4352: Social Network Analysis, Computer Science Department, Vanderbilt University

[L02]   Fairness in Recommendation   Oct 2022
CS 4352: Social Network Analysis, Computer Science Department, Vanderbilt University

[L01]   Information Diffusion and Influence Maximization   Feb 2022
DS 5720: Social Network Analysis, Data Science Institute, Vanderbilt University

Industry Presentations:

[I03]   Language Models Aided Interaction Generation   Aug 2024
Visa Research

[I02]   Multi-Interest Learning Towards Enhanced User Interest Diversity Fairness   Aug 2023
Visa Research

[I01]   Fairness in Recommender Systems - Popularity Bias   Jul 2023
Visa Research

TEACHING EXPERIENCE	**Vanderbilt University**	
	Teaching Assistant, Department of Computer Science	Jul 2021 – Present

- CS 4260: Artificial Intelligence (Spring 2023)
- CS 4352: Social Network Analysis (Fall 2022)
- DS 5720: Social Network Analysis (Spring 2022)
- CS 3265/5265: Database Management Systems (Fall 2021)

SERVICES

Organizer

• Student Director for Vanderbilt Machine Learning Seminar	2023–Present
• Web Chair for Machine Learning on Graphs (MLoG) Workshop @ ICDM	2023
• Web Chair for Machine Learning on Graphs (MLoG) Workshop @ WSDM	2023
• Web Chair for Privacy Algorithms in Systems (PAS) Workshop @ CIKM	2022

Conference Reviewer

• Association for the Advancement of Artificial Intelligence (AAAI)	2023 – 2025
• The Web Conference (WWW)	2023 – 2025
• International Conference on Web and Social Media (ICWSM)	2024 – 2025
• International Joint Conference on Artificial Intelligence (IJCAI)	2024
• GTA3@IEEE BigData, MLoG@ICDM, MLoG@WSDM	2022

Journal Reviewer

• IEEE Transactions on Neural Networks and Learning Systems (TNNLS)	2024 – Present
• ACM Transactions on Knowledge Discovery from Data (TKDD)	2023 – Present
• EEE Transactions on Knowledge and Data Engineering (TKDE)	2023 – Present
• Frontiers Big Data	2023 – Present

VOLUNTEERING **Conference Volunteering**

• Session Chair at AAAI	2023
• Volunteer at AAAI	2023
• Volunteer at KDD	2022

[CV compiled on 2024-11-16]