ZIHAO XU

Homepage, Google Scholar, Github
Computer Science, Rutgers University
zihao.xu@rutgers.edu
+1 848 313 5495

EDUCATION

- **Rutgers University** — **New Brunswick, NJ**
  Ph.D. in Computer Science and Technology — Sep. 2021 – Now
  Advised by Prof. Hao Wang
- **Shanghai Jiao Tong University** — **Shanghai, China**
  B.E. in Computer Science and Technology — Sep. 2016 – Jun. 2020
  ACM Honored Class, Zhiyuan College
  Advised by Prof. Hongtao Lu

RESEARCH INTEREST

- My research focuses on model generalization, with an emphasis on enhancing domain adaptation in probabilistic deep learning through the use of domain indices—vectors that embed domain semantics. I am particularly intrigued by Bayesian models, especially their potential to elucidate cognitive processes. Currently, my interest lies in improving the generalization capabilities of Large Language Models.

PUBLICATION

Domain-Indexing Variational Bayes: Interpretable Domain Index for Domain Adaptation

Zihao Xu*, Guang-Yuan Hao*, Hao He, Hao Wang

International Conference on Learning Representations (ICLR), 2023 (**Spotlight**)

Taxonomy-Structured Domain Adaptation

Tianyi Liu*, **Zihao Xu***, Hao He, Guang-Yuan Hao, Guang-He Lee, Hao Wang

International Conference on Machine Learning (ICML), 2023

Continual Learning of Large Language Models: A Comprehensive Survey

Haizhou Shi, **Zihao Xu**, Hengyi Wang, Weiyi Qin, Wenyuan Wang, Yibin Wang, Hao Wang

Arxiv preprint

Implicit In-context Learning

Zhuowei Li, **Zihao Xu**, Ligong Han, Yunhe Gao, Song Wen, Di Liu, Hao Wang, Dimitris N. Metaxas

Arxiv preprint

Graph-Relational Domain Adaptation

Zihao Xu, He Hao, Guang-He Lee, Yuyang Wang, Hao Wang

International Conference on Learning Representations (ICLR), 2022

Knowledge Graph-Enhanced Retrieval Augmented Generation for E-Commerce

Zihao Xu, Petar Ristoski, Qunzhi Zhou

RAGE-KG workshop for the 23rd International Semantic Web Conference

Towards a Generalized Bayesian Model of Reconstructive Memory

Zihao Xu, Pernille Hemmer, and Qiong Zhang

Computational Brain & Behavior, 2024

"*" indicates equal contribution.

PROFESSIONAL SERVICE

- Reviewer for AAAI Conference on Artificial Intelligence (AAAI) 2025
- Reviewer for International Conference on Machine Learning (ICML) 2024
- Reviewer for International Joint Conference on Artificial Intelligence (IJCAI) 2024
- Reviewer for International Conference on Learning Representations (ICLR) 2025,2024
- Reviewer for Conference on Neural Information Processing Systems (NeurIPS) 2023
- Reviewer for International Conference on Computer Vision (ICCV) 2023
- Reviewer for o ICLR 2022 Workshop PAIR2Struct 2022

RESEARCH EXPERIENCE

Magnit @ Meta **Remote**

Academic Collaborator Sep. 2024 – Now

- Modern recommender systems often use deep learning (DL) models to encode user and item data. However, the complexity and opacity of these models can obscure their workings and limit enhancements. To overcome these issues, we introduce Probabilistic Residual User Clustering (PRUC), a causal Bayesian model that clusters users to improve recommendations. Supervised by Zhigang Hua and Qi Xu.

eBay **San Jose, CA**

Applied Research Intern May. 2024 – Aug. 2024

- Large Language Models (LLMs) face challenges in e-commerce tasks due to inaccessible, frequently updated proprietary data. Fine-tuning with this data is costly and time-consuming. We propose a knowledge graph-enhanced retrieval augmented generation approach for e-commerce. Our KG, derived from eBay's inventory data, captures product relationships, enabling our framework to outperform baseline LLMs on three e-Commerce tasks in zero-shot and instruction-tuned settings. Supervised by Petar Ristoski and Qunzhi Zhou.

Amazon AI Lab **Shanghai, China**

Research Intern Aug. 2020 – Aug. 2021

Traditional Domain Adaptation (DA) methods treat all domains equally, ignoring their inherent heterogeneity that can be modeled using graphs. In this project, we proposed a graph-based domain adaptation method, resulting in the publication "Graph-relational Domain Adaptation" at ICLR 2022. Our approach extends adversarial learning by introducing a novel discriminator that models encoding-conditioned graph embeddings, theoretically yielding graph-invariant features. Experiments on AWS SageMaker validated our method on both synthetic and real datasets. Supervised by Prof. Hao Wang and Bernie Wang.

Pennsylvania State University – College of Information Sciences & Technology **University Park, PA**

Research Intern Jun. 2019 – Dec. 2019

- An Imitation-Learning-based method is adopted for the training of 3D object localizer, to see if action feedback can serve as a supervised signal. In a virtual environment, we trained the robot agent to navigate to certain objects (like chair) in the fewest steps. We made this pipeline differentiable, thus incorporating an imitation learning framework where agents are trained by expert trajectory. Directed by Prof. Zihan Zhou.

CODING LANGUAGE

- Python: Proficient
- C++: Familiar
- Java: Familiar
- Matlab: Familiar

SELECTED AWARDS AND HONORS

- University candidate of Apple Scholarship 2023
- ICLR Travel Award 2023
- SMC Scholarship 2018
- Eleme (饿了么) Scholarship 2017
- Zhiyuan Honors Scholarship 2018, 2017
- Academic Excellence Scholarship (Third-Class) 2018, 2017