ZIHAO XU

Homepage, Google Scholar, Github
Computer Science, Rutgers University
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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

- I am deeply interested in exploring model generalization in my research. More specifically, our work makes use of the domain index, a vector representing of each data domain, to enhance the effectiveness of domain adaptation. Furthermore, I find Bayesian models intriguing, especially their application in elucidating cognitive activities.

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

In International Conference on Machine Learning (ICML), 2023

Graph-Relational Domain Adaptation

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

International Conference on Learning Representations (ICLR), 2022

Towards a Generalized Bayesian Model of Category Effects

Zihao Xu, Pernille Hemmer, and Qiong Zhang

Society for Mathematical Psychology, 2023

"*" indicates equal contribution.

PROFESSIONAL SERVICE

- Reviewer for International Conference on Learning Representations (ICLR) 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

TA EXPERIENCE

- **Design and Analysis of Computer Algorithms (CS344),** Rutgers University — Spring, 2022, Fall 2023
- **Great Insights in Computer Science (CS105),** Rutgers University — Fall, 2021
- **Database System (CS392),** Shanghai Jiao Tong University — Spring, 2020
- **Programming Practice (MS106),** Shanghai Jiao Tong University — Spring, 2018

RESEARCH EXPERIENCE

Amazon AI Lab **Shanghai, China**

Research Intern Aug. 2020 – Aug. 2021

- Existing methods of Domain Adaptation (DA) usually treats every domain equally, but domains are heterogeneous. Such heterogeneity can be captured by a graph. In this project, we first propose the method for domain adaptation across a graph, which leads to the publication: "Graph-relational domain adaptation" in ICLR 2022. It generalizes the traditional adversarial learning method with a novel discriminator that models the encoding-conditioned graph embedding. Theoretical analysis has shown that graph-invariant features can be obtained with this new method, and experiments on both synthetic and real datasets verified the effectiveness of our method. Supervised by Prof. Hao Wang and Bernie Wang.

Shanghai Jiao Tong University – BCMI Laboratory **Shanghai, China**

Graduate Design (Research-Oriented) Jan. 2020 – Jun. 2020

- A new loss function called "focal IOU loss" is proposed for object detection. Compared with original IOU-based losses, this new loss not only improves the overall accuracy, but also increases the convergence speed. The project is written in PyTorch. Directed by Prof. Hongtao Lu.

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. The project is written in Keras and Tensorflow. Directed by Prof. Zihan Zhou.

Shanghai Jiao Tong University – BCMI Laboratory **Shanghai, China**

Research Assistant Jul. 2018 – Jun. 2019

- Collaborating with hybrid generation models (GAN, VAE, etc.), we generate images with high quality and diversity. During this time, I completed a project about style transfer on hand-written digits, using a GAN-like structure with VAE as a "style extractor". The project is written in PyTorch. Directed by Prof. Hongtao Lu.

OTHER SELECTED PROJECTS

Shanghai Jiao Tong University – Computer Vision (CS348) *score: 100 / 100* **Shanghai, China**

- Complete a project that using visual input to predict the background music rhythm.

Shanghai Jiao Tong University – Computer Science: Advanced Topics (CS086) *score: 91 / 100* **Shanghai, China**

- Propose a new neural network model called Random ODENet that shows great robustness against image fooling. The basic idea is adding randomness to ODENet to confuse the attack algorithm.

Shanghai Jiao Tong University – Compiler Design and Implementation (MS208) *score: 85 / 100* **Shanghai, China**

- X-compiler: a toy compiler for my compiler course, written in **Java**.

Shanghai Jiao Tong University – Database System (CS392) *score: 98 / 100* **Shanghai, China**

- **acmdb**: a toy database system for my database system course, written in **Java**.

CODING LANGUAGE

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

SELECTED AWARDS AND HONORS

- 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
- Shanghai Adolescents Science & Technology Innovation Contest (Second-Class) 2015
- Shanghai Young Physicists' Tournament for High School (First-Class) 2015
- Shanghai Applied Mathematics Paper Contest for High School (First-Class) 2015

ADDITIONAL INFORMATION

Activities

- I am the class president of the ACM Class of 2016.
- I am a member of Zhiyuan College's debate team.