

ZIHAO XU

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EDUCATION

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

RESEARCH INTEREST

- My research focuses on exploring model generalization. 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. At present, I am interested in enhancing the generalization capability 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
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 Machine Learning (ICML) 2024
- Reviewer for International Joint Conference on Artificial Intelligence (IJCAI) 2024
- 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 ICLR 2022 Workshop PAIR2Struct 2022

TA EXPERIENCE

- Data Management for Data Science (CS210)**, Rutgers University Spring 2024
- 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. **We utilized AWS SageMaker for experiments**, which confirmed the efficacy of our approach on both synthetic and real datasets. 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**.

- **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

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| • 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 |
| • 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.