

Xingxing Zhang

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EDUCATION

Beijing Jiaotong University (BJTU) — Institute of Information Science, Beijing, China

Doctor of Computer Science

Sep. 2015 – Jun. 2020

Advisor: Yao Zhao

University of Rochester (UR) — School of Computer Science, NY, USA

Visiting Student

Sep. 2018 – Oct. 2019

Advisor: Ji Liu

Henan Normal University (HNU) — School of Computer Science and Engineering, Xinxiang, China

Bachelor of Communication Engineering

Sep. 2011 – Jul. 2015

GPA: 3.9/4.0 (highest grade)

RESEARCH INTERESTS

Machine Learning and Optimization: data selection, small sample learning for novel categories, adversarial learning.

Computer Vision: image classification, recognition, and retrieval, video summarization, and motion segmentation.

PROJECTS

Research on Subset Selection based on Sparsity

Doctoral Innovation Foundation, Director

Jul. 2017 – Dec. 2018

- Proposed a ℓ_1 -norm induced prototype selection model for selecting the most representative data.
- Achieved online data selection by using already obtained prototypes and newly arrived data.
- Published at IEEE Trans. Neural Netw. Learn. Syst. (TNNLS).

Motion Segmentation based on Sparse Subspace Clustering

Doctoral Innovation Foundation, Director

Mar. 2016 – Mar. 2017

- Developed a general assignment model to achieve promising performance on motion segmentation task.
- Provided an additional generalization ability for the assignment model to deal flexibly with the unsupervised, semi-supervised and fully supervised scenarios.
- Published at IEEE Trans. Circuits Syst. Video Technol. (TCSVT).

Research on the Theory and Method of Prototype Selection in Machine Learning

National Natural Science Foundation of China, First member

Oct. 2019 – Dec. 2023

- Improve the discriminability of selected prototypes with self-supervised metric learning and saliency sampling.
- The first network framework to select prototypes in an end-to-end way.
- Apply prototype selection to various tasks, such as representation learning and zero-shot learning.

Pattern Recognition of Mixed Data and Research on Sensitive Content Mining

National Natural Science Foundation of China, Main member

Jan. 2016 – Dec. 2021

- Proposed an assignment model for selecting the most informative data from mixed data (e.g., cross-modal or noisy data).
- One of the first solutions for sensitive content mining of mixed data, i.e., adversarially attacked data.
- Published at IJCAI 2018, and submitted to IEEE Trans. Pattern Anal. Mach. Intell. (TPAMI).

PUBLICATIONS

Conference

- Xingxing Zhang, Zhenfeng Zhu, Yao Zhao, Deqiang Kong. "Self-Supervised Deep Low-Rank Assignment Model for Prototype Selection", in *Proc. IJCAI*, 2018, pp. 3141–3147.
- Zhizhe Liu*, Xingxing Zhang*, Zhenfeng Zhu, Shuai Zheng, Yao Zhao. "Convolutional Prototype Learning for Zero-Shot Recognition", in *Proc. CVM'20*, 2019. (*Equal contribution)
- Wenbin Li, Lei Wang, Xingxing Zhang, Jing Huo, Yang Gao, Jiebo Luo. "Defense Transferable Few-shot Adversarial Learning", under review by *CVPR'20*, 2019.
- Shuai Zheng, Zhenfeng Zhu, Xingxing Zhang, Zhizhe Liu, Jian Cheng, Yao Zhao. "Distribution-induced Bidirectional Generative Adversarial Network for Graph Representation Learning", under review by *CVPR'20*, 2019.

Journal

- Xingxing Zhang, Shupeng Gui, Zhenfeng Zhu, Yao Zhao, Ji Liu. "Hierarchical Prototype Learning for Zero-Shot Recognition", accepted by *IEEE Trans. Multimedia*, Nov. 2019.
- Xingxing Zhang, Zhenfeng Zhu, Yao Zhao, Dongxia Chang, Ji Liu. "Seeing All From a Few: ℓ_1 -norm Induced Discriminative Prototype Selection", *IEEE Trans. Neural Netw. Learn. Syst.*, vol. 30, no. 7, pp. 3187–3200, 2015.
- Xingxing Zhang, Zhenfeng Zhu, Yao Zhao, Dongxia Chang. "Learning a General Assignment Model for Video Analytics", *IEEE Trans. Circuits Syst. Video Technol.*, vol. 28, no. 10, pp. 3066–3076, Oct. 2018.
- Xingxing Zhang, Zhenfeng Zhu, Yao Zhao. "ProLFA: Representative Prototype Selection for Local Feature Aggregation", accepted by *Neurocomputing*, Nov. 2019.
- Xingxing Zhang, Zhenfeng Zhu, Yao Zhao. "Sparsity Induced Prototype Learning via $\ell_{p,1}$ -norm Grouping", *Journal of Visual Communication and Image Representation*, vol. 57, pp. 192–201, 2018.

6. **Xingxing Zhang**, Shupeng Gui, Zhenfeng Zhu, Yao Zhao, Ji Liu. "ATZSL: Defensive Zero-Shot Recognition in the Presence of Adversaries", under review by *IEEE Trans. Pattern Anal. Mach. Intell.*, 2019.
7. Meixiang Xu, Zhenfeng Zhu, **Xingxing Zhang**, Yao Zhao, Xuelong Li. "Canonical Correlation Analysis With $\ell_{2,1}$ -Norm for Multiview Data Representation", accepted by *IEEE Trans. Cybernetics*, Apr. 2019.
8. Fuzhen Li, Zhenfeng Zhu, **Xingxing Zhang**, Jian Cheng, Yao Zhao. "Diffusion Induced Graph Representation Learning", *Neurocomputing*, vol. 360, pp. 220-229, 2019.
9. Lin Sun, Jiucheng Xu, **Xingxing Zhang**, Wan Dong, Yun Tian. "A novel Generalized Arnold Transform-based Zero-Watermarking Scheme", *Applied Mathematics & Information sciences*, vol. 4, pp. 2023-2035, 2015.
10. Lin Sun, Jiucheng Xu, **Xingxing Zhang**, Yun Tian. "An image watermarking Scheme Using Arnold Transform and Fuzzy Smooth Support Vector Machine", *Mathematics Problems in Engineering*, Oct 11, 2015.
11. Yawei Zhao, Qian Zhao, **Xingxing Zhang**, En Zhu, Xinwang Liu, Jianping Yin. "Understand Dynamic Regret with Switching Cost for Online Decision Making", accepted by *ACM Trans. Intell. Syst. and Technol.*, Dec. 2019.
12. Yawei Zhao, Qian Zhao, **Xingxing Zhang**, En Zhu, Xinwang Liu, Jianping Yin. "Convex Clustering with Preservation of Instance-to-Instance Similarity", *ACM Trans. Intell. Syst. and Technol.*, Dec. 2019, Minor Revision.
13. Fuzhen Li, Zhenfeng Zhu, **Xingxing Zhang**, Yao Zhao. "From Anchor Generation to Distribution Alignment: Learning a Discriminative Embedding Space for Zero-Shot Recognition", under review by *Information Science*, 2019.
14. Zhenfeng Zhu, Yingying Meng, Deqiang Kong, **Xingxing Zhang**, Yandong Guo, Yao Zhao. "To See in the Dark: N2DGAN for Background Modeling in Nighttime Scene", under review by *IEEE Trans. Circuits Syst. Video Technol.*, 2019.

SELECTED HONORS AND AWARDS

Academic Scholarships

- National Scholarship for Graduate Students, BJTU, 2015, 2017, 2018, 2019
- National Scholarship for Undergraduate Students, HNU, 2014
- BJTU Top Grade Scholarship - ZHIXING Scholarship (10 graduates per year), BJTU, 2019
- Grant Scholarship of China Scholarship Council, CSC, 2018

Academic Awards

- Excellent Undergraduate in Henan Province, Department of Education of Henan Province, 2015
- Meritorious Award (rate $\approx 8\%$), National College Mathematical Contest in Modeling, 2014
- 2nd Prize, China Undergraduate Mathematical Contest in Modeling, 2013
- 3rd Prize, National Computer Simulation Competition, 2014
- 3rd Prize, National English Competition for College Students, 2014

SERVICE

- **PC Member:** IJCAI2019, IJCAI2020
- **Journal Reviewer:** IEEE Transactions on Circuits Systems for Video Technology (TCSVT), IEEE Transactions on Neural Networks and Learning Systems (TNNLS), Neurocomputing (NeuCom), Multimedia Tools and Applications (MTA)

INVITED TALKS

- IJCAI oral presentation, "Self-Supervised Deep Low-Rank Assignment Model for Prototype Selection", Stockholm, Sweden, 2018.
- NCIG'18 talk, "Prototype Selection: Modeling, Optimization, and Applications", Yangzhou, China.
- ChinaMM talk, "Missing View Completion for Multi-view Data", Nanjing, China, 2017.
- CUMCM talk, "Queue Length Model of Road Sections Caused by Traffic Accidents", Zhengzhou, China, 2013.

SKILLS & OTHERS

Mathematics: Matrix Computations, Linear Algebra, Convex Optimization.

Programming: Python, Matlab.

Operating Systems: Linux, MacOS, Windows.

Tools: Git, Vim, LATEX.

Open Sources: Pytorch, TensorFlow, OpenCV.

REFERENCES CONTACT INFORMATION

Yao Zhao

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 Director, Beijing Key Laboratory of Advanced Information Science and Network Technology,
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Ji Liu

Assistant Professor, Department of Computer Science, University of Rochester (has left),
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