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: data 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

1. **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.
2. Zhizhe Liu, **Xingxing Zhang**, Zhenfeng Zhu, Shuai Zheng, Yao Zhao. "Taking Modality-free Face Identification as Zero-shot Learning", under review by *Proc. ACM MM*, 2020.
3. Shuai Zheng, Zhenfeng Zhu, **Xingxing Zhang**, Zhizhe Liu, Jian Cheng, Yao Zhao. "Distribution-induced Bidirectional Generative Adversarial Network for Graph Representation Learning", in *Proc. CVPR*, 2020.
4. Wenbin Li, Lei Wang, **Xingxing Zhang**, Jing Huo, Yang Gao, Jiebo Luo. "Defense Transferable Few-shot Adversarial Learning", under review by *Proc. ECCV*, 2020.

Journal

1. **Xingxing Zhang**, Shupeng Gui, Zhenfeng Zhu, Yao Zhao, Ji Liu. "Hierarchical Prototype Learning for Zero-Shot Recognition", accepted by *IEEE Trans. Multimedia*, vol. 22, no. 7, pp. 1692 - 1703, 2020.
2. **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, 2019.
3. **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.
4. **Xingxing Zhang**, Zhenfeng Zhu, Yao Zhao. "ProLFA: Representative Prototype Selection for Local Feature Aggregation", accepted by Neurocomputing, Nov. 2019.
5. **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", *IEEE Trans. Pattern Anal. Mach. Intell.*, 2020, Under 2nd Revision.

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. 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.

10. Zhenfeng Zhu, Yingying Meng, Deqiang Kong, **Xingxing Zhang**, Yandong Guo, Yao Zhao. "To See in the Dark: N2DGAN for Background Modeling in Nighttime Scene", accepted by *IEEE Trans. Circuits Syst. Video Technol.*, 2020.

11. Zhizhe Liu, **Xingxing Zhang**, Zhenfeng Zhu, Shuai Zheng, Yao Zhao. "Convolutional Prototype Learning for Zero-Shot Recognition", accepted by *Image and Vision Computing*, 2020.

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. Yawei Zhao, **Xingxing Zhang**, Sihang Zhou, Xinwang Liu, En Zhu, Yingwen Chen, Jianping Yin. "Projection-free Online Gradient Descent over a Non-smooth Set", under review by *IEEE Trans. Knowledge and Data Engineering*, 2019.

14. 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.

15. Xu Yang, Zhenfeng Zhu, Meixiang Xu, **Xingxing Zhang**. "Multi-view data missing completion", Journal of Software, 2018.

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 Beijing, Department of Education of Beijing, 2020
- 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, 2018.
- 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

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