ZHANGJIE CAO

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Education

Stanford University — *U.S.A*
PH.D. OF COMPUTER SCIENCE — *September 2018 - Now*

Tsinghua University — *China*
BACHELOR OF SOFTWARE ENGINEERING — *September 2014 - July 2018*
- GPA: 91/100

Research Interests

Robotics, Transfer Learning, Machine Learning, Deep Learning, Computer Vision

Honors & Awards

2015	**National Scholarship (rank 1/64)**, Tsinghua University	*China*
2015	**Best Project Award (rank 1/56)**, Course of Architecture of Computer and Network	*China*
2016	**Qualcomm Scholarship**, Tsinghua University	*China*
2018	**Rank 3 in Visual Domain Adaptation Challenge (VisDA-2018)**, ECCV2018 Workshop Challenge (http://ai.bu.edu/visda-2018)	*Munich, Germany*
2019	**Outstanding reviewers**, CVPR 2019	*Long Beach, CA, USA*

Publications

1. **Zhangjie Cao***, Erdem Bıyık, Woodrow Z. Wang, Allan Raventos, Adrien Gaidon, Guy Rosman, Dorsa Sadigh. **Reinforcement Learning based Control of Imitative Policies for Near-Accident Driving**. *Robotics: Science and Systems (**RSS**)*, 2020.
2. Amir Zamir, Alexander Sax, Jitendra Malik, Nikhil Cheerla, Rohan Suri, **Zhangjie Cao**, Leonidas Guibas. **Robust Learning Through Cross-Task Consistency**. *Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2020.
3. Kaidi Cao, Jingwei Ji*, **Zhangjie Cao***, Chien-Yi Chang, Juan Carlos Niebles. **Few-Shot Video Classification via Ordered Temporal Alignment**. *Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2020.
4. Bingbin Liu, Ehsan Adeli, **Zhangjie Cao**, Kuan-Hui Lee, Abhijeet Shenoi, Adrien Gaidon, Juan Carlos Niebles. **Spatiotemporal Relationship Reasoning for Pedestrian Intent Prediction**. *International Conference on Robotics and Automation (**ICRA**)*, 2020.
5. Yuxuan Song, Lantao Yu, **Zhangjie Cao**, Zhiming Zhou, Jian Shen, Shuo Shao, Weinan Zhang, Yong Yu. **Improving Unsupervised Domain Adaptation with Variational Information Bottleneck**. *European Conference on Artificial Intelligence (**ECAI**)*, 2020.
6. Boxiao Pan, **Zhangjie Cao***, Ehsan Adeli, Juan Carlos Niebles. **Adversarial Cross-Domain Action Recognition with Co-Attention**. *AAAI Conference on Artificial Intelligence (**AAAI**)*, 2020.
7. Aditya Grover, Christopher Chute, Rui Shu, **Zhangjie Cao**, Stefano Ermon. **AlignFlow: Learning from Multiple Domains via Normalizing Flows**. *AAAI Conference on Artificial Intelligence (**AAAI**)*, 2020.
8. **Zhangjie Cao***, Kaichao You*, Mingsheng Long, Jianmin Wang, Qiang Yang. **Learning to Transfer Examples for Partial Domain Adaptation**. *Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2019.

9. Hong Liu*, **Zhangjie Cao***, Mingsheng Long, Jianmin Wang, Qiang Yang. **Separate to Adapt: Open Set Domain Adaptation via Progressive Separation** . *Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2019.
10. Kaichao You, Mingsheng Long, **Zhangjie Cao**, Jianmin Wang, Michael I. Jordan. **Universal Domain Adaptation**. *Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2019.
11. Yang Shu, **Zhangjie Cao**, Mingsheng Long, Jianmin Wang. **Transferable Curriculum for Weakly-Supervised Domain Adaptation**. *AAAI Conference on Artificial Intelligence (**AAAI**)*, 2019.
12. Mingsheng Long, **Zhangjie Cao**, Jianmin Wang, Michael I. Jordan. **Conditional Adversarial Domain Adaptation**. *Neural Information Processing Systems (**NIPS**)* 2018.
13. **Zhangjie Cao**, Lijia Ma, Mingsheng Long, Jianmin Wang. **Partial Adversarial Domain Adaptation**. *European Conference on Computer Vision (**ECCV**)*, 2018.
14. Mingsheng Long, **Zhangjie Cao**, Jianmin Wang, Han Zhu, Michael I. Jordan. **Learning Transferable Visual Features with Very Deep Adaptation Networks**. *IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**)*.
15. **Zhangjie Cao**, Mingsheng Long, Ziping Sun, Jianmin Wang. **Deep Priority Hashing**. *ACM Multimedia Conference (**ACM MM**)*, 2018.
16. **Zhangjie Cao**, Mingsheng Long, Jianmin Wang, Michael I. Jordan. **Partial Transfer Learning with Selective Adversarial Networks**. *Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2018.
17. **Zhangjie Cao**, Mingsheng Long, Chao Huang, Jianmin Wang. **Transfer Adversarial Hashing for Hamming Space Retrieval**. *AAAI Conference on Artificial Intelligence (**AAAI**)*, 2018.
18. Zhongyi Pei†, **Zhangjie Cao**†, Mingsheng Long, Jianmin Wang. **Multi-Adversarial Domain Adaptation**. *AAAI Conference on Artificial Intelligence (**AAAI**)*, 2018. (†Equal Contribution)
19. Mingsheng Long, **Zhangjie Cao**, Jianmin Wang, Philip S. Yu. **Learning Multiple Tasks with Multilinear Relationship Networks**. *Neural Information Processing Systems (**NIPS**)*, 2017.
20. **Zhangjie Cao**, Mingsheng Long, Jianmin Wang, Philip S. Yu. **HashNet: Deep Learning to Hash by Continuation**. *International Conference on Computer Vision (**ICCV**)*, 2017.
21. **Zhangjie Cao**, Qixing Huang, Ramani Karthik. **3D Object Classification via Spherical Projections**. *International Conference on 3D Vision (**3DV**)*, 2017.
22. **Zhangjie Cao**, Mingsheng Long, Qiang Yang. **Transitive Hashing Network for Heterogeneous Multimedia Retrieval**. *AAAI Conference on Artificial Intelligence (**AAAI**)*, 2017. (**Oral Presentation**)

Professional Experience

Reviewer for Conferences, Journals
Computer Vision: CVPR 2019-2020, ICCV 2019, ECCV 2020, BMVC 2020, WACV 2021, IJCV 2019
Machine Learning: ICML 2019, NeurIPS 2019-2020, ICLR 2020-2021
Artificial Intelligence: AAAI 2020-2021, IJCAI 2021
Robotics: CoRL 2020

Work Experience

Waymo LLC (self-driving company) *U.S.A*
Mentor: Yin Zhou
Realistic Scene Simulation *June. 2019 - Sept. 2019*

- Work as a research intern on a project for realistic simulation of full scene to address simulation difficulty on rarely existing corner cases and novel objects, which has huge impact on Waymo.
- Propose a novel generative model to refine the fake input scene and generate realistic scene with the same semantic as the input.
- Writing the main part of the paper for the work.

Research Experience

Department of Computer Science, Stanford University *U.S.A*

Mentor: Dorsa Sadigh

Project: Human Modeling in Near-Accident Scenarios *Sept. 2019 - Jan. 2019*

- Propose a method to model human driving behavior in near accident scenarios.
- Outperform imitation learning and hard-coded policies in aspects of comfort and safety.
- The work is published in RSS 2020.

Department of Computer Science, Stanford University *U.S.A*

Mentor: Dorsa Sadigh

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Department of Computer Science, Stanford University *U.S.A*

Mentor: Amir R. Zamir

Project: Cross-Task Consistency *May 2019 - June 2019*

- Proposed a flexible and fully computational framework for learning with consistency across an arbitrary dictionary of tasks.
- Proved that consistency constraints can improve the generalization power of the model to out-of-distribution data.
- The paper has been published in CVPR 2020.

Department of Computer Science, Stanford University *U.S.A*

Mentor: Stefano Ermon

Paper: AlignFlow: Cycle Consistent Learning from Multiple Domains via Normalizing Flows *Feb. 2019 - May 2019*

- Proposed to use normalizing flows in generative model, which is flexible in loss (Adversarial training or Maximum likelihood).
- AlignFlow guarantees exact cycle consistency in mapping datapoints from one domain to another.
- The paper has been published in AAAI 2020.

Department of Computer Science, Stanford University *U.S.A*

Mentor: Juan Carlos Niebles

Project: Learning for Videos *Oct. 2018 - Feb. 2019*

- Address intent prediction by modeling the relation between pedestrians and environment objects with spatiotemporal graph.
- The method achieved good results on real-world driving datasets and the paper has been published in ICRA 2020.
- Proposed cross-domain action recognition to recognize actions of an unlabeled domain with a labeled related domain.
- Designed a co-attention module and a temporal-aligned adaptation module for global action distribution matching.
- The method achieved significant performance and the paper has been published at AAAI 2020.

Department of Computer Science, The University of Texas at Austin *U.S.A*

Mentor: Qixing Huang

Paper: 3D Object Classification via Spherical Projections *Feb. 2017 - May. 2017*

- Proposed a spherical representation leveraging depth variation and contour information for 3D objects.
- Developed deep neural networks composing of two parts for depth and contour representation respectively to classify 3D objects.
- Implemented Spherical Projection in caffe framework and carefully designed experiments to compare our method with state of the art methods under standard evaluation criteria on large scale 3D Recognition Dataset.
- Wrote the first version of the paper under the supervision of my mentor.

National Lab for Big Data Systems, School of Software, Tsinghua University *China*

Mentor: Mingsheng Long

Projects on Domain Adaptation *Sept. 2016 - June. 2018*

- Proposed a Multi-Adversarial Domain Adaptation to train multiple adversaries weighted by probability over classes.
- Proposed a new partial domain adaptation setting with source label space includes target and a selective adversarial network with multiple adversarial networks and both instance-level and class-level weights to address it.
- Further proposed a single adversarial network architecture to address partial domain adaptation

National Lab for Big Data Systems, School of Software, Tsinghua University *China*

Mentor: Mingsheng Long

Projects on Deep Learning to Hash *Jan. 2016 - Nov. 2017*

- Proposed a new cross-modal retrieval scenario without explicit relationship and a Transitive Hashing Network to solve it.
- Proposed HashNet with binary output and enable optimization of sign activation function by continuation method.
- Proposed Transfer Adversarial Hashing the first model focusing on cross-domain retrieval within Hamming Radius 2.
- Proposed Deep Focal Hashing (DFH) with priority loss to address the class imbalance and easy-hard imbalance problems.

Department of Computer Science and Lewis-Sigler Institute of Integrative Genomics, Princeton University *U.S.A*

Mentor: Olga Troyanskaya

Project: Deep Learning for Noncoding Variants Recognition *July. 2016 - August. 2016*

- Designed new architecture with multiple classifiers builded on each convolutional layers to exploit low level features and solved the gradient vanishing problem of the original network.
- Considering the relation of different chromatin features (labels), I improved the classifying layer with low rank technical.
- The new architecture outperformed existing methods under standard evaluation criteria such as AUC of PR Curve and ROC Curve.