Jialian Wu

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Education

Ph.D. Candidate, State University of New York at Buffalo 08/2019–Present

- Computer Science and Engineering
- Advisor: Dr. Junsong Yuan
- GPA: 3.9/4.0

Graduate Study, Tianjin University 09/2018–07/2019

- M.Eng. in Electronic Information Engineering

(Left for University at Buffalo in July 2019 before finishing my degree)

Bachelor of Engineering, Tianjin University 09/2014–07/2018

- Electronic Information Engineering
- GPA: 3.85/4.0 (90.94/100)
- Rank: 5/84
- Thesis: Multi-level Feature Fusion Network for Object Detection. (Outstanding Bachelor Thesis)

Research Interest: Object-centric video analysis including detection, segmentation, and tracking. I am also open to explore other interesting research topics in computer vision field.

Publications

First-Author Papers:

- ***Multi-Object Tracking***: We propose a TraDeS tracker that exploits tracking cues estimated from a cost volume map to temporally propagate object features for enhancing current object recognition.
  - **Jialian Wu**, Jiale Cao, Liangchen Song, Yu Wang, Ming Yang, and Junsong Yuan, "Track to Detect and Segment: An Online Multi-Object Tracker", in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2021. [Project Page] [PDF] [Code]
- ***Extension of the Forest R-CNN***.
  - **Jialian Wu**, Liangchen Song, Qian Zhang, Ming Yang, and Junsong Yuan, "ForestDet: Large-Vocabulary Long-Tailed Object Detection and Instance Segmentation", IEEE Transactions on Multimedia (TMM), 2021. [PDF] [Code]
- ***Occluded Pedestrian Detection in Videos***: We propose to exploit less-occluded pedestrians from adjacent spatial-temporal space to aid the detection of heavily occluded pedestrians in current frame.
  - **Jialian Wu**, Chunluan Zhou, Ming Yang, Qian Zhang, Yuan Li, and Junsong Yuan, "Temporal-Context Enhanced Detection of Heavily Occluded Pedestrians", in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition* (CVPR), 2020. [PDF]
- ***Large-Vocabulary and Long-tailed Object Detection***: We propose to build a forest classifier based on object relations, which can suppress the noisy logits existed in a fine-grained classifier.
  - **Jialian Wu**, Liangchen Song, Tiancai Wang, Qian Zhang, and Junsong Yuan, "Forest R-CNN: Large-Vocabulary Long-Tailed Object Detection and Instance Segmentation", in *Proceedings of the ACM International Conference on Multimedia* (ACM MM), 2020. [PDF] [Code]
- ***Small-scale Pedestrian Detection***: We propose to utilize the features of large-scale pedestrians from the same neural network to help the feature learning of the small-scale pedestrians.
  - **Jialian Wu**, Chunluan Zhou, Qian Zhang, Ming Yang, and Junsong Yuan, "Self-Mimic Learning for Small-scale Pedestrian Detection", in *Proceedings of the ACM International Conference on Multimedia* (ACM MM), 2020. [PDF]

Second-author Papers:

- ***Multi-View Pedestrian Detection***
  - Liangchen Song, **Jialian Wu**, Ming Yang, Qian Zhang, Yuan Li, and Junsong Yuan, "Stacked Homography Transformations for Multi-View Pedestrian Detection", in *Proceedings of the IEEE International Conference on Computer Vision* (ICCV), 2021. (Oral)
- ***Multi-label image classification***
  - Liangchen Song, **Jialian Wu**, Ming Yang, Qian Zhang, Yuan Li, and Junsong Yuan, "Handling Difficult Labels for Multi-label Image Classification via Uncertainty Distillation", in *Proceedings of the ACM International Conference on Multimedia* (ACM MM), 2021.
- ***Knowledge Transferring***: We propose a hybrid network forwarding scheme to transfer the knowledge encoded in a teacher network to a student network.
  - Liangchen Song, **Jialian Wu**, Ming Yang, Qian Zhang, Yuan Li, and Junsong Yuan, "Robust Knowledge Transfer via Hybrid Forward on the Teacher-Student Model", in *Proceedings of the AAAI Conference on Artificial Intelligence* (AAAI), 2021. [PDF]

Industry Research Experience

Applied Scientist Intern, Amazon, Seattle, WA, USA May – August, 2021

Amazon Go Team, Mentor: Dr. Tian Lan and Dr. Hui Liang

- Work on video instance segmentation. The proposed work is submitted to **CVPR 2022**.

Research Intern, Horizon Robotics, Cupertino, CA, USA May – August, 2020

Autonomous Driving Perception Team, Mentor: Dr. Yu Wang

- TraDeS: An online multi-object tracker with **>430** GitHub stars accepted to **CVPR 2021**.
- TraDeS is widely used by the computer vision community. It has been applied to 6 different datasets and 4 tasks with state-of-the-art performance by us or third-parties, including Nuscenes (3D box tracking), MOT (2D box tracking), MOTS and Youtube-VIS (instance segmentation tracking), OVIS (occluded video instance segmentation), and MvMHAT (multi-vide persons tracking).

Research Intern, Horizon Robotics, Beijing, China May – August, 2018

Mentor: Dr. Qian Zhang

- Work on pedestrian detection. Two research works are accepted to **CVPR 2020** and **ACM MM 2020**, respectively.

Other Projects

Alibaba Cloud Tianchi Competition April – May, 2019

- Rank 30th / 2157 teams in China and 1st / 44 teams in Tianjin City.
- Achieve object detection and segmentation in X-ray images.

Object Detection for Autonomous Driving Ship, TJU Vision Intelligence Lab March – May, 2018

- Complete dataset building (images & annotations), algorithm implementation, and interface design.

National Innovation Project for Undergraduate Students March – May, 2017

- Achieve pedestrian detection in foggy weather by using the traditional hog+svm detector with a hard example mining scheme.

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Awards

- Best CSE First Year Achiever Award, State University of New York at Buffalo, 2020.
- Outstanding Bachelor Thesis, Tianjin University, 2018.
- First-class Entrance Fellowship, Tianjin University, 2018.
- Tianjin City Fellowship, 2016.
- Merit Student Fellowship, Tianjin University, 2017, 2016, 2015.

Professional Services

Reviewer:

- Conferences: CVPR 2020/2021(outstanding reviewer)/2022, ICCV 2021, AAAI 2021/2022, IJCAI 2021, WACV 2021/2022, ICASSP 2021, ACCV 2020
- Journals: IEEE Transactions on Image Processing, IEEE Transactions on Circuits and Systems for Video Technology, Neurocomputing, Machine Vision and Applications

Teaching Assistant:

- CSE573: Computer Vision and Image Processing, Fall 2019.
- CSE191: Discrete Structures, Spring 2020.