Haodong Duan

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Education

Peking University , Beijing 2015 – 2019

GPA 3.77/4.00, rank 1st in Data Science students
Undergraduate in Data Science, Yuanpei College

Chinese University of HongKong , HongKong 2019 – Present

Working on *Video Understanding*, supervised by Dahua Lin
Ph.D. candidate in Information Engineering

Research Interests

My research interests lie in the area of computer vision and video understanding. In particular, I'm focusing on efficient video understanding (data-efficient & computationally efficient), based on skeleton action recognition.

Research Projects

Skeleton Action Recognition with Dynamic Group-wise GCN 2021 – 2022

Design a dynamic GCN model for skeleton action recognition, that requires no pre-defined skeleton topology. The model achieves good recognition performance that surpasses previous SOTAs significantly. Using official annotations, we achieve 89.6%, 91.4% Top-1 on two NTURGB+D 120 splits, 40.3% Top-1 on Kinetics.

Video Self-supervised Learning via Ranking-based Transformation Recognition, Paper 2021

Show the great potential of RecogTrans (recognizing transformations applied to video clips) video SSL by introducing a unified Ranking-based formulation. The proposed method significantly outperforms previous RecogTrans approaches on action recognition (UCF Top1 +6%) and video retrieval (UCF R@1 +20%).

Efficient Video Recognition for Untrimmed Videos, Paper 2021

Propose OCSampler for untrimmed video recognition. It samples frames from candidates to form one representative clip. The framework (w. R50) achieves 82.2% Top-1 with 1-clip testing (only 52 GFLOPs / video).

Skeleton Action Recognition with 3D ConvNets, Paper, Dataset, Code 2020 – 2021

Devise a novel 3D-ConvNet based paradigm (**PoseC3D**: 2D keypoint heatmaps → 3D heatmap volumes → 3D-CNN recognizer) for skeleton action recognition. PoseC3D outperforms previous skeleton action recognition approaches by a considerable margin across various benchmarks (NTURGB+D, Kinetics, *etc.*).

Mitigating Unwanted Bias in Action Recognition 2020

Demonstrate that deep learning based video recognition is biased towards factors like scene / objects. Create a quantitative benchmark to evaluate the bias, mitigate the bias with adversarial training and diversified web data.

Omni-sourced Webly-supervised Video Recognition, Paper, Dataset, Code 2019 – 2020

Propose **OmniSource** for webly supervised video recognition, which utilizes various kinds of web data, including images, trimmed / untrimmed videos for trimmed video recognition. Achieve 83.6% Top-1 on Kinetics400.

Triplet Representation for Human Body, Paper, Dataset 2018 – 2019

Design a triplet representation named TRB (as well as its estimation method) to represent 2D human body, which includes both human pose and shape information. The representation can be used in human shape editing.

Publications

Haodong Duan, Jiaqi Wang, Kai Chen, Dahua Lin
PYSKL: Towards Good Practices for Skeleton Action Recognition (MM 2022)

Haodong Duan, Yue Zhao, Kai Chen, Dahua Lin, Bo Dai
Revisiting Skeleton-based Action Recognition (CVPR 2022 Oral)

Haodong Duan, NanXuan Zhao, Kai Chen, Dahua Lin
TransRank: Self-supervised Video Representation Learning via Ranking-based Transformation Recognition (CVPR 2022 Oral)

Jintao Lin, **Haodong Duan**, Kai Chen, Dahua Lin, Limin Wang
OCSampler: Compressing Videos to One Clip with Single-step Sampling (CVPR 2022)

Haodong Duan, Yue Zhao, Yuanjun Xiong, Wentao Liu, Dahua Lin
Omni-sourced Webly-supervised Learning for Video Recognition (ECCV 2020)

Haodong Duan, Kwanyee Lin, Sheng Jin, Wentao Liu, Chen Qian, Wanli Ouyang
TRB: A Novel Triplet Representation for Understanding 2D Human Body (ICCV 2019)

OpenSource Projects

The main contributor and maintainer of MMAction, MMAction2, and PYSKL.

Professional activities

Conference Reviewer: ICCV 2021, AAAI 2022, CVPR 2022, ECCV 2022, and NeurIPS 2022.
Journal Reviewer: TCSVT, SPL, JVCIR.

Language Skills

- TOEFL iBT test: 104pt (Reading: 30, Listening: 28, Speaking: 20, Writing: 26)
- GRE test: 322pt (Verbal: 152, Quantitative: 170)