

# HAODONG DUAN

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## EDUCATION

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**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

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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

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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.

Omni-sourced Webly-supervised Video Recognition, [Paper](#), [Dataset](#), [Code](#) 2019 – 2020

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

Mitigating Unwanted Bias in Action Recognition 2020

Demonstrate that deep learning based video recognition models are biased towards factors like scene or objects. Establish a new quantitative benchmark to evaluate such bias and propose to mitigate such bias with adversarial training and diversified web data.

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.*).

Efficient Video Recognition for Untrimmed Videos, [Paper](#) 2021

Propose an efficient framework for untrimmed video recognition, which samples frames from frame candidates to form one representative clip. The framework (w. R50 backbone) can achieve 82.2% Top-1 with 1-clip testing (the computational cost is only 52 GFLOPs / video).

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%).

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

Design a fully-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.

## PUBLICATIONS

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

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

**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)

## OPENSOURCE PROJECTS

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The main contributor and maintainer of [MMAction](#), [MMAction2](#), and [PYSKL](#).

## PROFESSIONAL ACTIVITIES

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Conference Reviewer for ICCV 2021, AAAI 2022, CVPR 2022, ECCV 2022, and NeurIPS 2022.  
Transactions Reviewer for TCSVT, SPL.

## LANGUAGE SKILLS

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