



中国科学技术大学

University of Science and Technology of China

# Leverage Interactive Affinity for Affordance Learning

**Hongchen Luo**, Wei Zhai, Jing Zhang, Yang Cao, Dacheng Tao  
University of Science and Technology of China

JD Explore Academy

The University of Sydney

Institute of Artificial Intelligence, Hefei Comprehensive National Science Center

# Contents

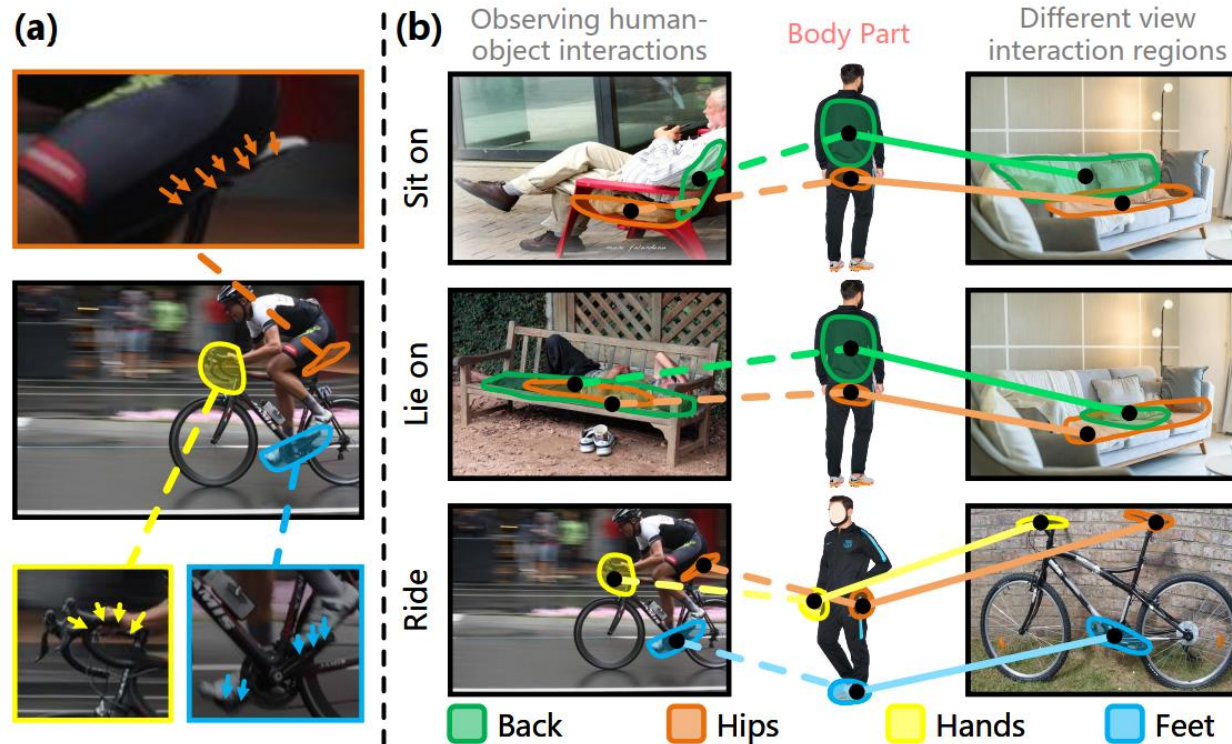


中国科学技术大学  
University of Science and Technology of China

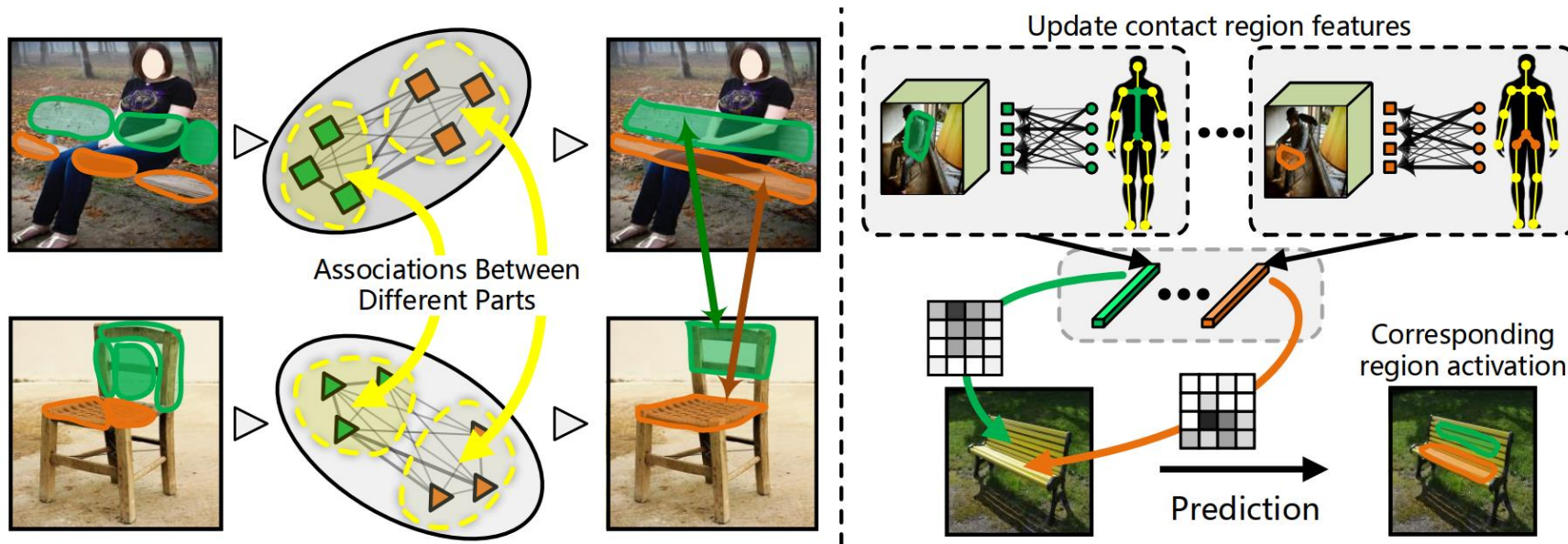
- 1. Problem**
- 2. Motivation**
- 3. Method**
- 4. Dataset**
- 5. Experiment**

## Interactive affinity

**Interactive affinity** refers to the contact between different parts of the human body and the local regions of a target object.



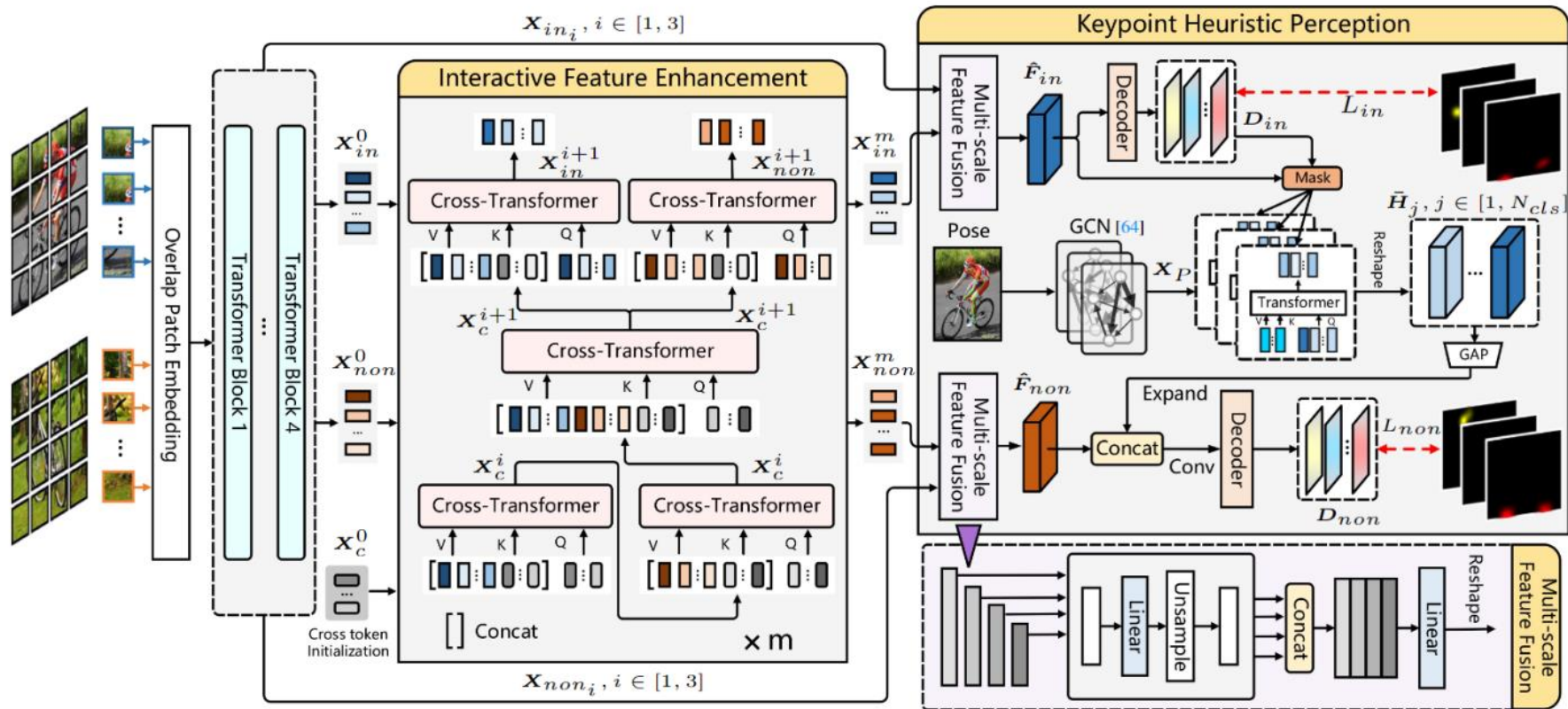
# Motivation



- This paper explores the associations of interactable regions between diverse images by considering the context of contact regions with different body parts.
- This paper considers leveraging the connection of human pose keypoints to alleviate the uncertainties due to interaction diversities and contact occlusions.



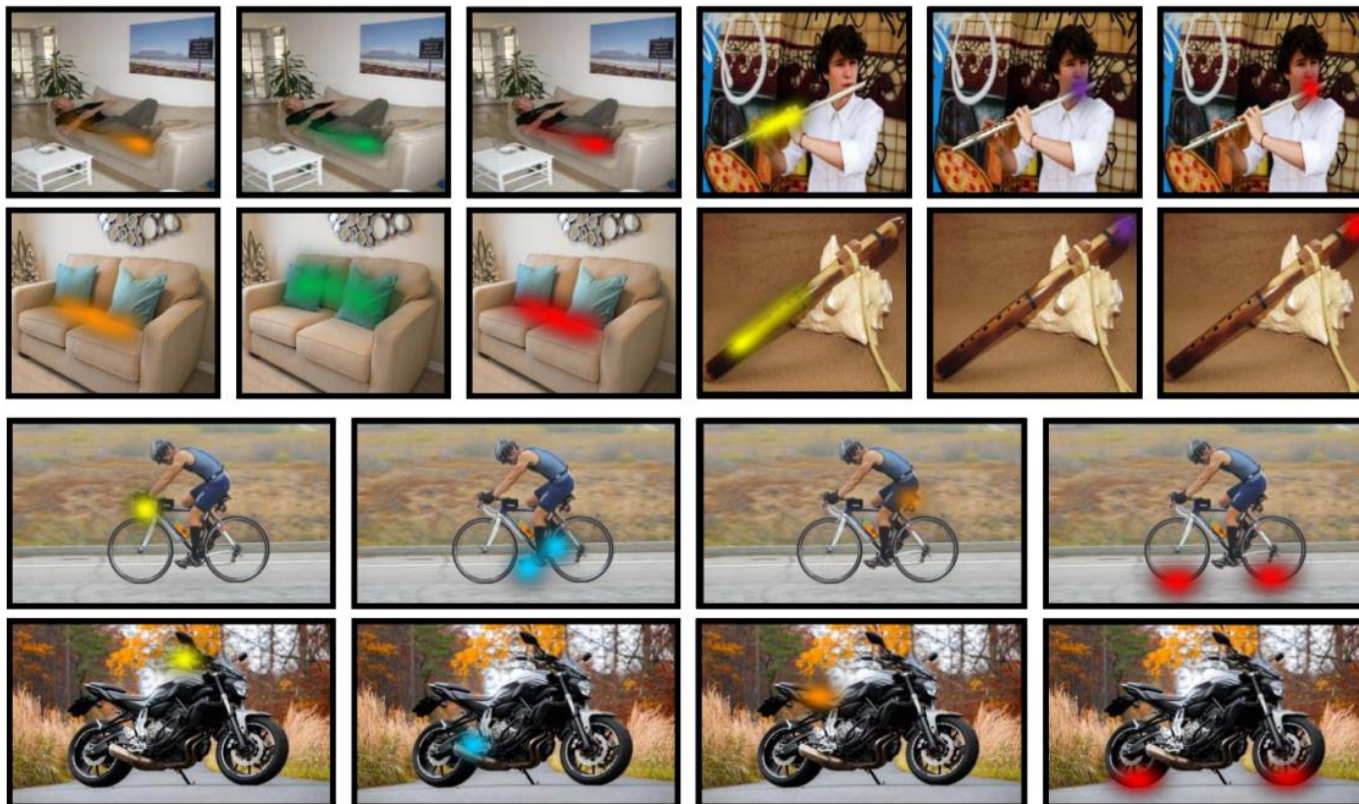
# Method






# Dataset

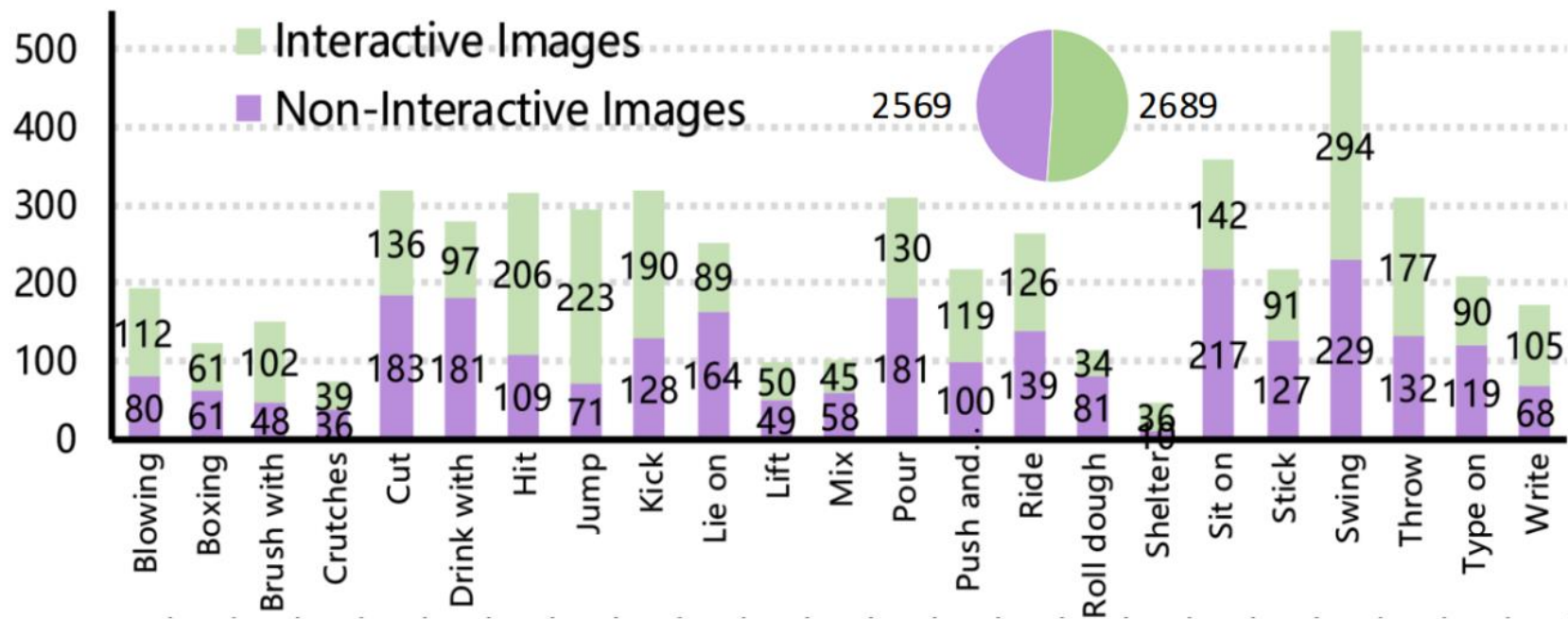


中国科学技术大学  
University of Science and Technology of China



-  Back
-  Hips
-  Hands
-  Feet
-  Mouth
-  Outside

# Dataset

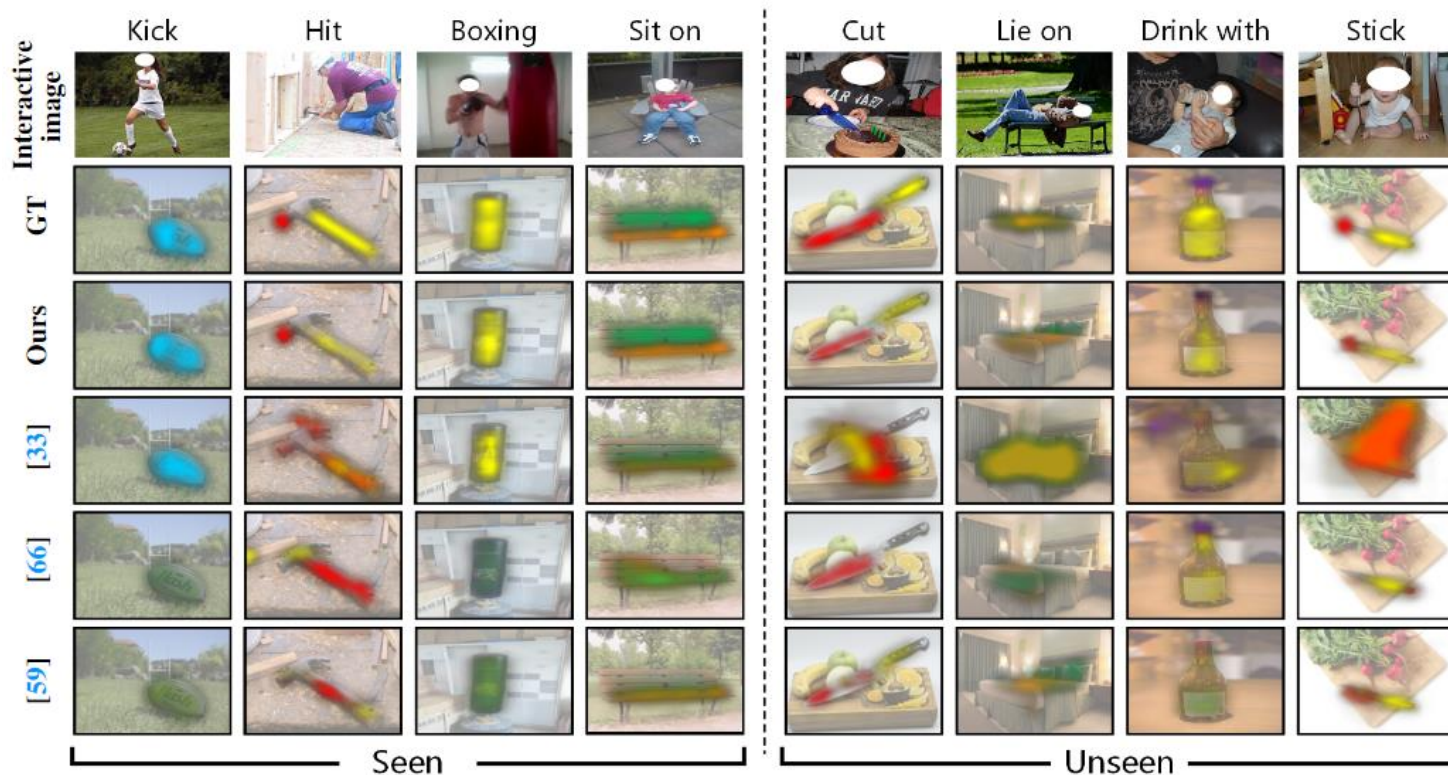




# Experiment



Method	Seen			Unseen			params (M)
	KLD ↓	SIM ↑	NSS ↑	KLD ↓	SIM ↑	NSS ↑	
PSPNet [68]	1.738 $\diamond 44.5\%$	0.332 $\diamond 127.7\%$	1.431 $\diamond 160.2\%$	9.491 $\diamond 70.3\%$	0.224 $\diamond 92.0\%$	0.960 $\diamond 139.9\%$	53.31
DLabV3+ [8] $\diamond$	1.347 $\diamond 28.4\%$	0.683 $\diamond 10.7\%$	3.256 $\diamond 14.3\%$	5.632 $\diamond 49.9\%$	0.374 $\diamond 15.0\%$	1.993 $\diamond 15.6\%$	40.35
SegFormer [59]	1.198 $\diamond 19.4\%$	0.741 $\diamond 2.0\%$	3.543 $\diamond 5.1\%$	5.957 $\diamond 52.4\%$	0.401 $\diamond 3.6\%$	2.167 $\diamond 0.2\%$	27.25
HRNet [52]	14.897 $\diamond 93.5\%$	0.196 $\diamond 285.7\%$	1.859 $\diamond 100.3\%$	17.984 $\diamond 84.3\%$	0.045 $\diamond 855.6\%$	0.525 $\diamond 338.7\%$	28.54
ViTPose [61] $\clubsuit$	4.303 $\diamond 77.6\%$	0.376 $\diamond 101.1\%$	1.456 $\diamond 156.3\%$	5.545 $\diamond 49.1\%$	0.246 $\diamond 74.8\%$	0.805 $\diamond 186.1\%$	89.99
HRFormer [66]	1.259 $\diamond 23.4\%$	0.729 $\diamond 3.7\%$	3.479 $\diamond 7.0\%$	5.855 $\diamond 51.8\%$	0.393 $\diamond 9.4\%$	2.109 $\diamond 9.2\%$	10.10
HSNet [33] $\spadesuit$	2.014 $\diamond 52.1\%$	0.431 $\diamond 75.4\%$	1.922 $\diamond 93.7\%$	3.016 $\diamond 6.4\%$	0.234 $\diamond 83.8\%$	1.007 $\diamond 128.7\%$	26.13
<b>Ours</b>	<b>0.965</b>	<b>0.756</b>	<b>3.732</b>	<b>2.823</b>	<b>0.430</b>	<b>2.303</b>	<b>36.32</b>



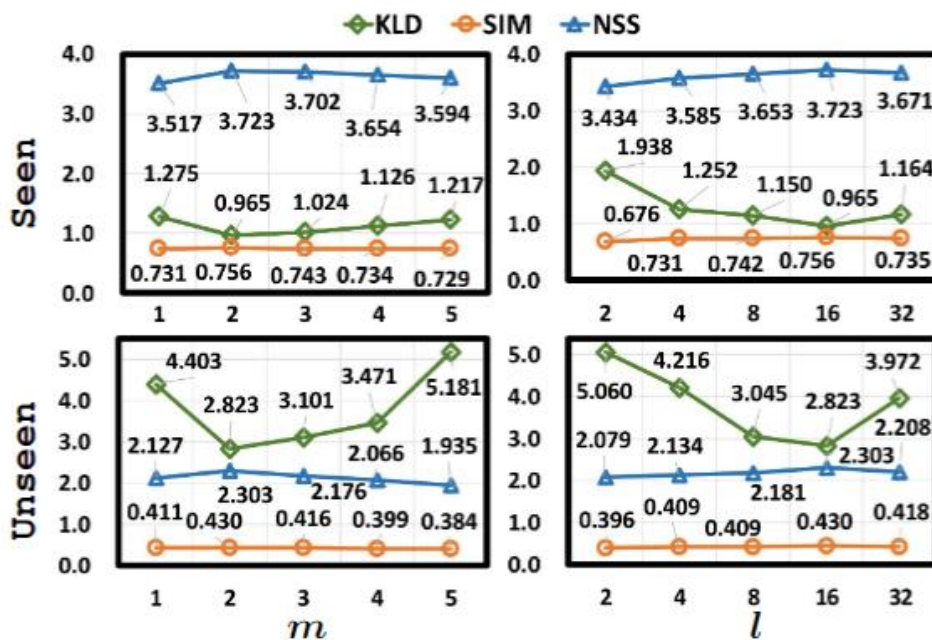
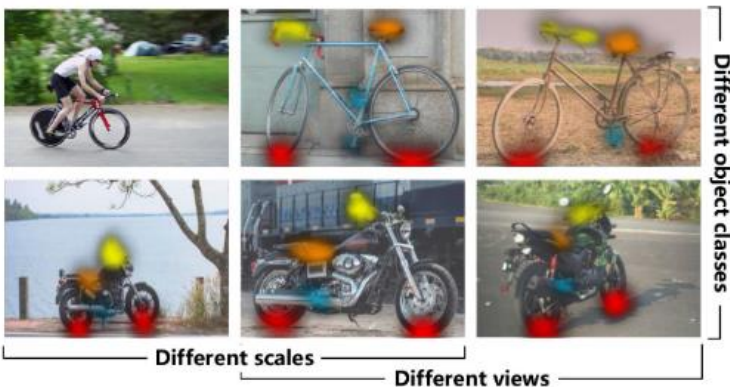


# Experiment



PSPNet [68]	0.721	1.966	0.560	1.040	1.238	1.390	2.233	0.541	1.186	3.278	1.607	2.366	2.465	0.531	1.367	3.269	1.825	2.047	2.015	1.958	1.393	2.561	1.757
DLabV3+ [8]	0.133	1.211	0.120	1.656	0.836	0.888	0.959	0.152	0.787	2.584	1.393	4.518	0.968	0.123	0.677	2.602	1.092	2.439	1.787	4.115	0.686	1.738	0.744
SegFormer [59]	0.080	1.109	0.101	1.651	0.870	0.798	0.653	0.145	1.850	3.036	0.655	2.706	0.594	0.095	0.473	2.676	0.291	1.472	0.765	3.201	0.521	1.747	0.128
HRNet [52]	9.851	15.942	14.310	16.327	9.513	15.934	15.148	14.262	10.440	17.731	10.228	17.670	15.067	12.498	15.683	16.456	17.475	17.803	16.426	17.185	15.612	16.657	19.218
HFormer [66]	0.127	1.130	0.262	2.406	0.803	0.476	0.712	0.107	1.632	2.590	0.763	4.235	1.171	0.074	0.374	2.723	0.334	1.368	1.255	3.330	0.333	1.540	0.179
HSNet [33]	0.558	1.441	1.240	1.007	1.743	1.550	1.619	0.206	1.731	4.007	1.749	2.109	1.867	1.216	1.093	2.951	1.893	2.739	2.068	6.069	3.389	1.454	1.507
Ours	0.089	0.368	0.869	0.717	0.729	0.834	0.626	1.672	1.015	2.541	0.627	1.487	0.238	0.752	0.285	2.486	0.412	0.736	0.663	1.454	0.289	1.260	0.155
	Type on	Brush with	Kick	Jump	Swing	Cut	Ride	Boxing	Hit	Sit on	Roll dough	Blowing	Push and pull	Throw	Drink with	Lie on	Mix	Stick	Write	Lift	Pour	Crutches	Shelter

8.980	8.954	12.019	10.886	8.837	7.800
5.635	5.188	4.669	8.399	7.155	4.177
6.998	4.818	4.541	9.223	6.985	4.962
18.188	18.367	19.678	18.165	18.198	18.207
5.966	4.720	4.945	9.173	6.344	5.509
2.011	4.031	3.394	6.147	2.077	2.106
3.156	2.620	3.445	5.077	2.209	1.708
Brush with	Stick	Lie on	Lift	Drink with	Cut





# Thanks!

# Q&A