

Comparison of Mean/Max operation in Aggregation. We apply mean operator in inter-class message aggregation function because the operator is symmetric and representative for the message from neighborhood while we apply maximization operator in inter-class message aggregation function instead. We conduct experiments that compare the effectiveness of mean operation and max operation in intra-class and inter-class message aggregation functions.

As illustrated in Table 1, either replacing the intra-class message aggregation with a maximization or replacing the inter-class message aggregation with mean operation cause clear decrease on V-COCO and HICO-DET. The results show that mean operator is representative, while inter-class context means whether the entities have interactions with each other or not and maximization can better eliminate the unrelated messages from noninteractive entities.

Table 1. Comparisons of mean/max operation on V-COCO and HICO-DET(%)

Method	V-COCO	HICO-DET	
	AP_{role}	Default(Full)	Known Object(Full)
intra/inter			
aver/max	52.7	17.57	21.00
max/max	52.5	16.40	19.86
aver/aver	52.5	16.78	20.24
max/aver	52.0	16.16	19.88