

PRN: Psychology-Inspired Relation Network for Detecting Social Interaction Groups from Single Images

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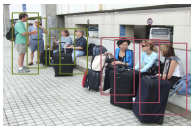
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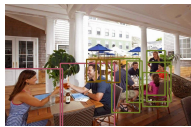
1 Examples of SID and the difference between IG and SIG

1.1 Examples of SID

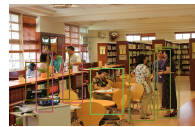
In order to present the data in this paper more comprehensively, for each of the nine scenes in the SID, one image is selected and the annotation of the social interaction group in that scene is shown in Fig. 1.



(a) Bus stop.



(b) Café.



(c) Library.



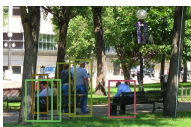
(d) Classroom.



(e) Conference.



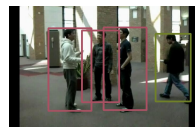
(f) Court.



(g) Park.



(h) Sidewalk.

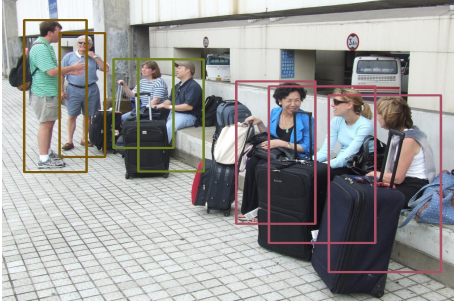


(i) Others.

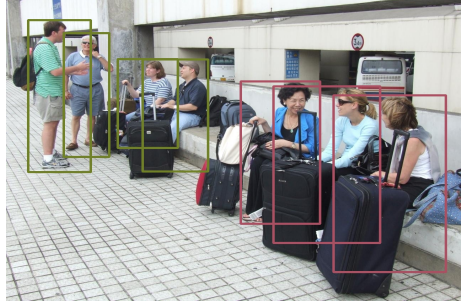
Figure 1: Here are some examples to illustrate the annotation. Different social interaction groups are denoted with bounding boxes of different colours.

1.2 Difference between IG and SIG

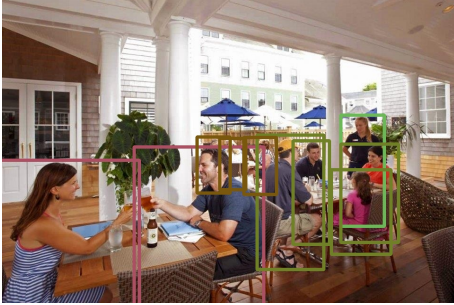
Besides, three scenes are displayed to highlight the difference between IG and SIG. The results are shown in Fig. 2.



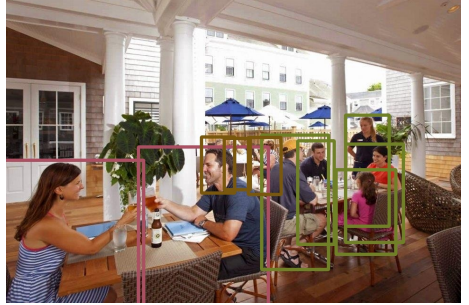
(a)



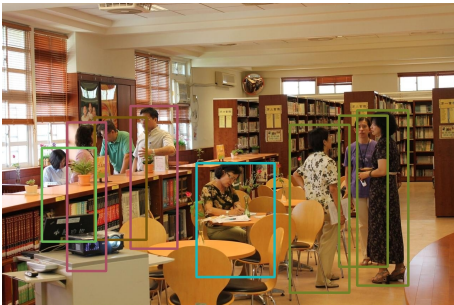
(b)



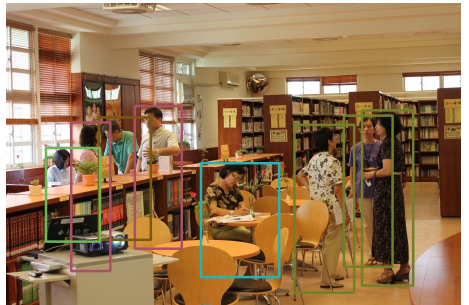
(c)



(d)



(e)



(f)

Figure 2: The left (a), (c) and (e) are from IG while the right (b), (d) and (f) are from SIG.

2 The analysis for some hyper-parameters.

Here, λ in Eq (4) and β in Eq (11) are selected for sensitivity analysis.

Table 1: Sensitivity analysis for two hyper-parameters λ and β .

λ / β	Precision	Recall	F1-score	Accuracy	AUC
0.1/1	52.25	73.89	61.21	76.66	85.41
0.1/5	49.73	72.93	59.13	74.87	83.32
0.1/8	60.00	67.36	63.47	80.67	86.38
0.1/10	66.78	64.97	65.86	83.21	88.03
0.1/12	64.30	63.38	63.83	82.10	87.46
0.5/1	48.74	79.94	60.55	74.04	87.12
0.5/5	52.13	78.03	62.50	76.66	85.72
0.5/8	51.47	83.76	63.76	76.26	85.48
0.5/10	57.78	70.38	63.46	79.79	85.30
0.5/12	66.08	71.97	68.90	83.80	87.71
1/1	48.90	85.03	62.09	74.12	85.38
1/5	51.08	82.64	63.14	75.94	86.28
1/8	60.98	71.66	65.89	81.50	87.84
1/10 (Ours)	63.69	68.47	66.10	82.49	88.07
1/12	60.79	68.63	64.47	81.14	87.50
2/1	43.11	93.63	59.04	67.61	82.35
2/5	46.78	85.51	60.47	72.13	84.96
2/8	54.54	77.55	64.04	78.29	86.75
2/10	57.49	75.16	65.15	79.95	87.32
2/12	50.84	81.69	62.68	75.74	85.11

From the result, we choose the results with the highest AUC. According to the experimental results, the two parameters showed small variations for the two metrics F1 and AUC. It indicates that the parameters were not sensitive in these two metrics. On the other hand, the changes were larger in precision and recall. This indicates that these two metrics are sensitive to hyper-parameters.