

Supplemental Materials on

Multiple Random Walkers and Their Application to Image Cosegmentation

1. MRW Clustering on Point Data

The companion video clip illustrates the MRW clustering on point data. During the MRW process, multiple agents repel one another, while forming their own dominant regions. By comparing the probabilities at each node, we obtain the clustering result.

2. Feature Encoding

Table S-1. Summary of node features for computing intra-image affinity weights w_{ij} .

l	Feature	Feature encoding	λ_l	Dimension	Dissimilarity
1	RGB	Super-pixel mean	0.1	3	Euclidean
2	LAB	Super-pixel mean	0.2	3	Euclidean
3	Boundary cue	-	0.2	1	-
4	RGB	Bag-of-Visual-Words	0.2	100	Chi-square
5	LAB	Bag-of-Visual-Words	0.3	100	Chi-square

Table S-2. Summary of node features for computing inter-image affinity weights w_{ij} .

l	Feature	Feature encoding	λ_l	Dimension	Dissimilarity
1	SIFT	Bag-of-visual-words	0.5	100	Chi-square
2	LAB	Bag-of-Visual-Words	0.2	100	Chi-square
3	Texton	Bag-of-Visual-Words	0.3	100	Chi-square

Tables S-1 and S-2 summarize the feature encoding schemes to compute intra-image and inter-image affinity weights w_{ij} , respectively. For each ‘Super-pixel mean’ encoding, we average all feature values in a super-pixel node and use the Euclidean distance for measuring the dissimilarity. For the ‘Boundary cue,’ we use the sum of the gradient magnitudes on the line connecting the centers of two super-pixel nodes directly as the dissimilarity. For each ‘Bag-of-visual-words’ encoding, we build codewords via the k -means clustering and construct the codeword histogram for a super-pixel node. In this case, we use the Chi-square distance for measuring the dissimilarity.

3. More Cosegmentation Results

The rest of this supplemental report provides more cosegmentation results. Figures S-1 and S-2 show examples of cosegmentation results on the image classes in Table 1. Figures S-3, S-4, and S-5 are more cosegmentation results on the other image classes in the iCoseg dataset. Finally, Figures S-6 and S-7 provide the results on image sets, collected from the online photo service Flickr®.

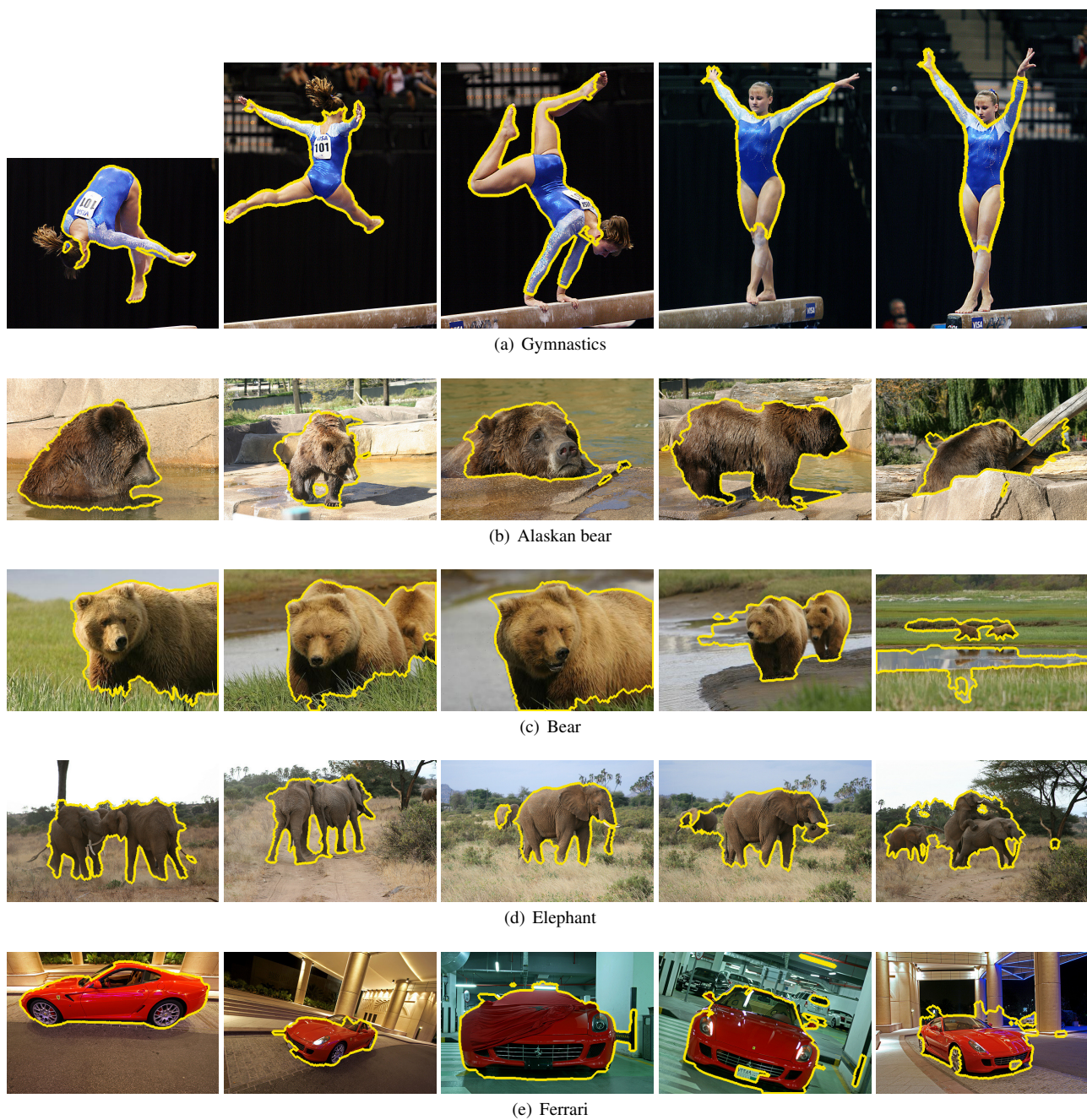


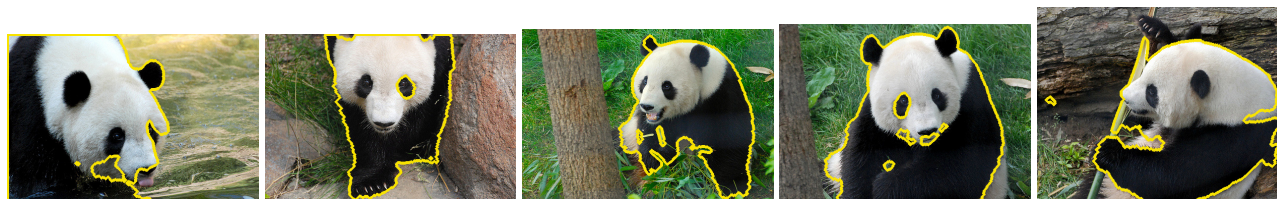
Figure S-1. Examples of cosegmentation results on the image classes in Table 1.



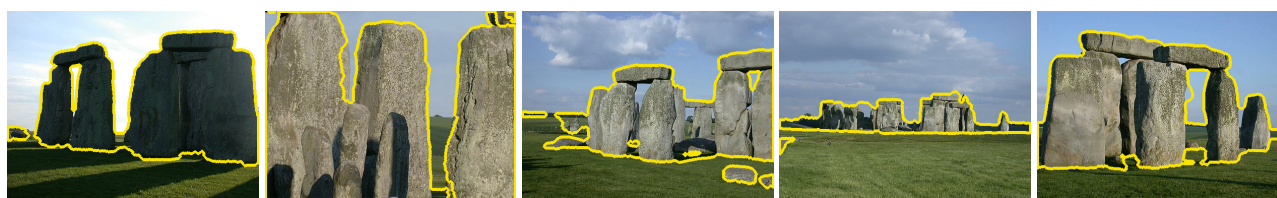
(a) Liverpool



(b) Kite



(c) Panda



(d) Stonehenge 2

Figure S-2. Examples of cosegmentation results on the image classes in Table 1.



(a) Pyramid (10)



(b) Kendo (10)



(c) Christ (10)



(d) Monks (10)



(e) Kite 2 (11)



(f) Skating 2 (12)

Figure S-3. More cosegmentation results on the iCoseg dataset. For each test, the number of used images is within the parenthesis after the class name.



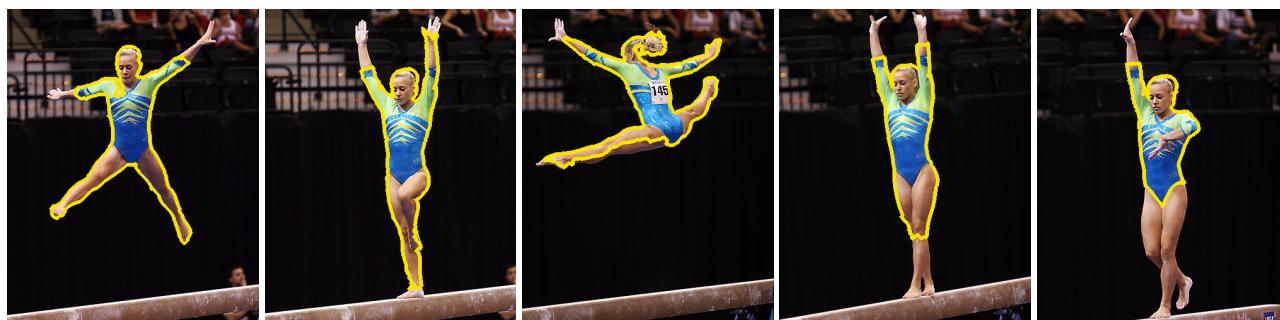
(a) Woman Soccer 1 (10)



(b) Woman Soccer 2 (10)



(c) Plane (7)



(d) Gymnastics 2 (6)

Figure S-4. More cosegmentation results on the iCoseg dataset. For each test, the number of used images is within the parenthesis after the class name.



(a) Helicopter (12)



(b) Cheetah (10)

Figure S-5. More cosegmentation results on the iCoseg dataset. For each test, the number of used images is within the parenthesis after the class name.



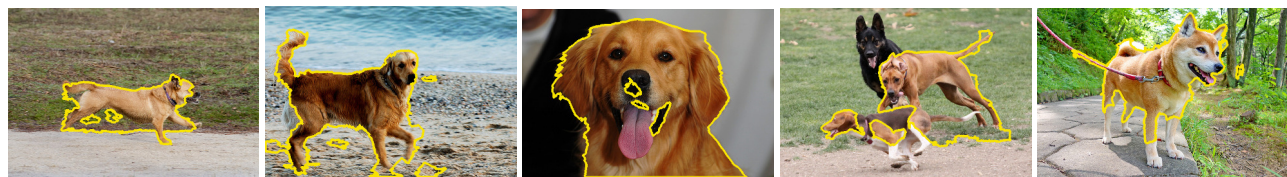
(a) Parrot (8)



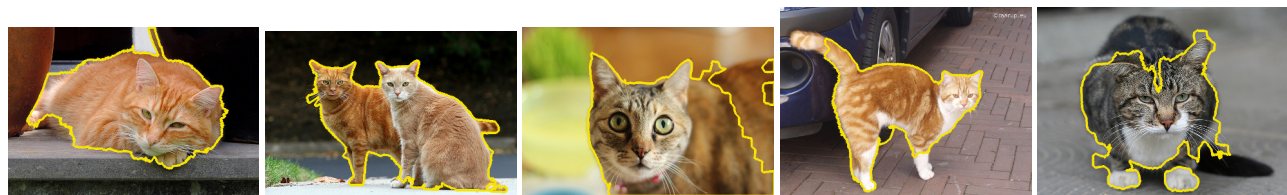
(b) Sheep (8)



(c) Golden Gate Bridge (7)



(d) Dog (8)



(e) Cat (7)

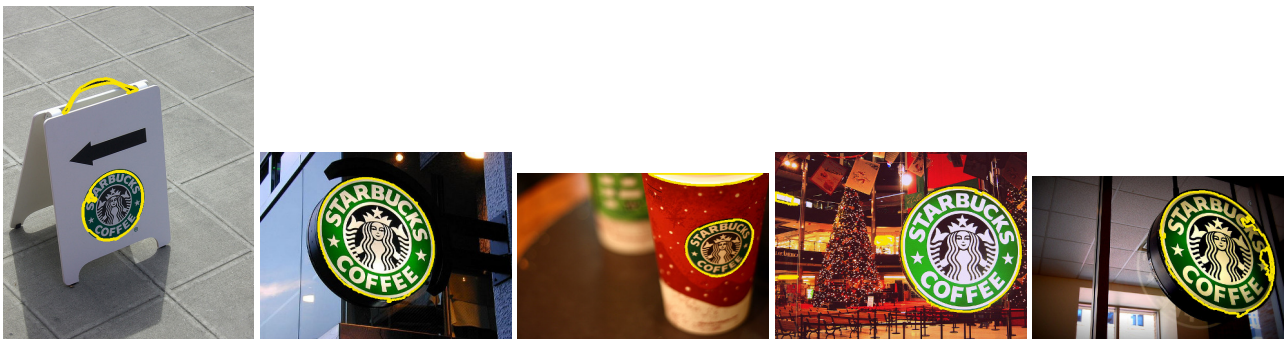
Figure S-6. Cosegmentation results on image collections from Flickr[®]. For each test, the number of used images is within the parenthesis after the class name.



(a) Sather Tower (6)



(b) Red Panda (7)



(c) Starbucks (8)



(d) Telephone Booth (7)

Figure S-7. Cosegmentation results on image collections from Flickr[®]. For each test, the number of used images is within the parenthesis after the class name.