CA-Jaccard: Camera-aware Jaccard Distance for Person Re-identification

Supplementary Material

6. The Computation Details of CA-Jaccard Distance

Alg. 1 delineates the whole computation steps for CA-Jaccard distance. First, extract features of all samples by model f_θ and calculate the original distance matrix D. Then, find CKRNNs by applying k-reciprocal constraint in intra-camera and inter-camera ranking lists. Next, turn these CKRNNs of samples into weighted CKRNNs vectors. Subsequently, use CLQE to obtain the weighted neighbors vertors. Finally, CA-Jaccard distance matrix D^{CAJ} is computed by the overlap between weighted expanded neighbors vectors of samples.

Algorithm 1 The computation procedures of CA-Jaccard distance

Input: Dataset $X = \{x_i\}_{i=1}^N$ with camera labels $\{c_i\}_{i=1}^N$, model f_θ;
Output: Jaccard distance matrix D^{CAJ};
Extract features from X by the model f_θ;
// CA-Jaccard distance computation steps
// Step 1: Original distance computation
Calculate original distance matrix D;
// Step 2: CKRNNs
Find CKRNNs with Eq. 11;
// Step 3: Vectorization of neighbors
Encode CKRNNs into weighted CKRNNs vectors with Eq. 4;
// Step 4: CLQE
Use CLQE (Eq. 12) to obtain weighted expanded neighbors vectors
// Step 5: Overlap computation
Compute the CA-Jaccard distance matrix D^{CAJ} with Eq. 6;

7. Additional Visualizations

Some additional visualizations are presented to further verify the effectiveness of CA-Jaccard distance.

Clustering scene. We visualize the distance distribution of intra-camera and inter-camera positive pairs for two datasets in Fig. 7. As shown in Fig. 7, compared to baseline, our CA-Jaccard distance significantly reduces the difference between distribution of intra-camera and inter-camera positive pairs for both datasets. These observations further verify the effectiveness and reliability of our CA-Jaccard distance.

Re-ranking scene. More retrieval results are visualized in Fig. 8. CA-Jaccard distance effectively ranks more positive samples into the top of ranking list which are absent in the ranking lists of BoT and BoT+KR. These findings indicate that CA-Jaccard distance metric can produce more accurate distances.

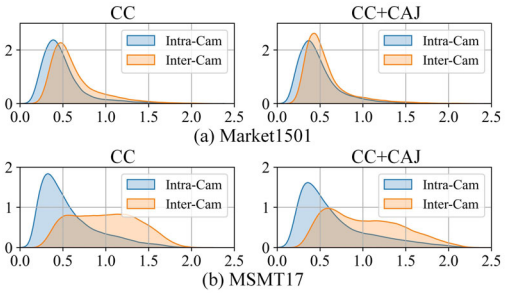

Figure 7. Distance distributions of intra-camera and inter-camera positive pairs on (a) Market1501 and (b) MSMT17.

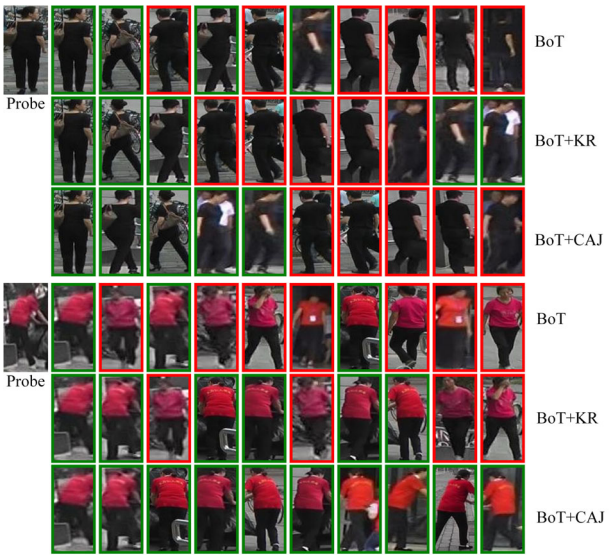

Figure 8. More retrieval results on the Market1501 dataset. For each probe, the first, second, and third rows correspond to the ranking results produced by BoT, BoT+KR, and BoT+CAJ respectively. The person surrounded by a green box represents the same person as the probe, while the person surrounded by a red border represents a different person from the probe image.