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Day-Night Cross-domain Vehicle Re-identification

Supplementary Material

1. Dataset details and protocols

DN-348 dataset consists of 34,077 images of 348 different vehicles, captured under different lighting conditions and orientations. The training set contains 200 identities with 19,984 bounding boxes, while the testing set contains 148 identities with 14,093 bounding boxes. It is important to note that all the bounding boxes in this dataset were manually cropped and annotated by a single person. The training set includes 9,962 bounding boxes from the daytime domain and 10,022 bounding boxes from the nighttime domain. The testing set consists of 10,121 bounding boxes from the daytime domain and 3,972 bounding boxes from the nighttime domain. During the testing stage, the performance of the DN-ReID models is evaluated using both the daytime to nighttime domain (Day-to-Night) and the nighttime to daytime domain (Night-to-Day). For the Day-to-Night setting, the query set consists of 10,121 daytime bounding boxes and the gallery set consists of 3,972 nighttime bounding boxes. For the Night-to-Day setting, the query set and gallery set are swapped.

DN-Wild dataset consists of 140,897 images of 2286 distinct vehicles from the testing set of VERI-Wild 2.0 dataset [1], where 1574 identities with 106,365 images and 712 identities with 34,532 images are assigned as training and testing respectively. In the testing set of VERI-Wild 2.0 dataset [1], all the images have been cropped and annotated. However, these images only have identity labels. To divide the day and night sample set, we train a day-night sample discriminator to assign day-night labels by using the DN-348 dataset. The training set consists of 70,981 images from the daytime domain and 35,384 images from the nighttime domain. The testing set comprises 14,964 images from the daytime domain and 19,568 images from the nighttime domain. Both the Day-to-Night and Night-to-Day settings are utilized for evaluating the performance of the DN-ReID models, similar to the DN-348 dataset. For the Day-to-Night setting, the query set is composed of 2,617 daytime images and the gallery set is composed of 19,568 nighttime images. For the Night-to-Day setting, the query set is composed of 2,610 nighttime images and the gallery set is composed of 14,964 daytime images.
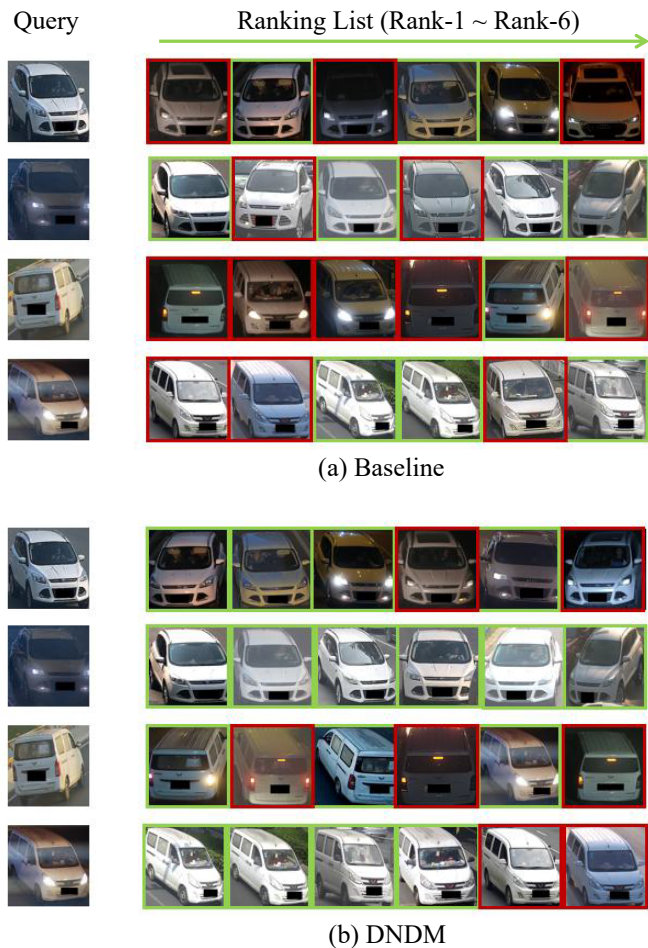

(a) Baseline

(b) DNDM

Figure 1. Top 6 ranking results on DN-348 dataset. The images with green bounding boxes and the rest ones indicate the correct and wrong matching results.

References

[1] Yan Bai, Jun Liu, Yihang Lou, Ce Wang, and Ling-Yu Duan. Disentangled feature learning network and a comprehensive benchmark for vehicle re-identification. *IEEE TPAMI*, 44(10): 6854–6871, 2021. 1