Supplementary File for:
"Cross-scenario Transfer Person Re-identification"

Xiaojuan Wang, Wei-Shi Zheng, Xiang Li, and Jianguo Zhang

1 Effect of Different Weights to Different Source Datasets

We systematically varied the weights for the source datasets to evaluate their effects on performance, keeping the sum of the weights assigned to the different source datasets equal to one.

Specifically, when there were two source datasets, we varied the weight of one source from 0 to 1 with a step size 0.1. When there were three source datasets, we randomly sampled the weights 20 times based on a uniform distribution due to increased number of weight parameters. The weights assigned to different source datasets each time were L1 normalized to guarantee that the sum is equal to one.

We conducted this experiment on four different transfer cases, "VIPeR + CAVIAR $\rightarrow$ i-LIDS", "CAVIAR + i-LIDS $\rightarrow$ VIPeR", " VIPeR + i-LIDS $\rightarrow$ 3DPeS", and "VIPeR + CAVIAR + i-LIDS $\rightarrow$ 3DPeS. All experimental settings are the same as the presented in Sec. 5.1 in the main manuscript. Meanwhile, rather than only using the default value of γ, we also set its value to 0.2 and 0.5, and further investigated its effect. The results are shown in Table 1, Table 2, Table 3 and Table 4 as below.

Assigned weights	$\gamma = 0.8$				$\gamma = 0.2$				$\gamma = 0.5$			
	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$
$0.1, 0.9$	35.76	58.31	72.57	85.12	30.27	52.43	65.87	80.54	33.64	56.47	70.40	83.33
$0.2, 0.8$	34.25	59.43	71.45	84.61	30.78	53.50	67.38	82.04	33.80	56.68	71.30	84.78
$0.3, 0.7$	34.91	59.48	70.39	85.17	30.95	54.45	67.38	80.25	34.07	56.62	69.67	83.94
$0.4, 0.6$	35.19	59.09	70.62	84.16	31.90	55.11	67.60	81.25	33.57	56.40	70.79	83.82
$0.5, 0.5$	35.64	58.86	70.45	83.72	31.28	54.34	67.71	81.37	33.52	55.56	70.57	83.66
$0.6, 0.4$	33.91	58.97	70.17	83.83	30.78	54.05	67.48	81.19	34.14	56.07	69.72	83.94
$0.7, 0.3$	33.08	58.30	68.54	83.49	32.79	54.11	66.53	82.08	34.14	55.45	69.34	83.60
$0.8, 0.2$	32.35	57.52	68.21	82.71	32.01	54.22	66.65	81.25	34.08	55.73	68.71	84.77
$0.9, 0.1$	31.90	56.00	69.67	82.53	30.16	55.17	66.47	81.36	33.68	56.46	67.99	83.20

Table 1: Matching rate(%) in "VIPeR + CAVIAR $\rightarrow$ i-LIDS" with different weights assigned to different source datasets.

As shown in the tables, there indeed exists a better performance when suitable parameters are set. However, it is also observed that the performances under different combinations of weights vary in a very small range. And similar phenomenon could be observed with $\gamma = 0.2, 0.5$.

We acknowledge that it is still currently challenging to find a theoretically optimal combination of different source datasets due to introducing more parameters into the modeling, which is a more

Assigned weights	$\gamma = 0.8$				$\gamma = 0.2$				$\gamma = 0.5$			
	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$
$0.1, 0.9$	19.81	46.14	61.58	76.96	16.77	40.22	54.11	69.81	19.75	46.42	61.20	76.01
$0.2, 0.8$	19.97	47.72	62.12	77.72	15.79	38.20	52.56	67.94	20.25	48.01	61.46	76.14
$0.3, 0.7$	20.00	47.66	62.72	77.91	15.60	36.27	49.46	64.40	20.51	47.44	61.87	75.28
$0.4, 0.6$	20.41	48.16	62.85	78.07	14.56	33.92	46.74	61.68	20.06	46.74	60.89	74.78
$0.5, 0.5$	20.35	48.26	63.01	77.94	13.77	31.77	43.77	59.43	19.49	45.98	59.78	74.46
$0.6, 0.4$	20.28	47.63	63.35	77.63	13.16	29.65	41.71	56.93	18.73	45.13	59.46	74.21
$0.7, 0.3$	20.22	47.63	63.35	77.82	12.66	29.05	39.87	54.75	17.97	44.65	58.39	73.58
$0.8, 0.2$	20.00	47.72	62.75	77.75	11.90	28.29	38.23	52.97	17.66	44.05	57.69	72.75
$0.9, 0.1$	19.91	47.56	62.25	77.28	11.74	27.47	37.03	51.58	17.18	42.88	56.68	71.46

Table 2: Matching rate(%) in "CAVIAR + i-LIDS $\rightarrow$ VIPeR" with different weights assigned to different source datasets.

Assigned weights	$\gamma = 0.8$				$\gamma = 0.2$				$\gamma = 0.5$			
	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$
$0.1, 0.9$	31.21	52.64	62.63	72.53	30.76	51.84	62.10	73.77	31.88	53.25	63.40	74.18
$0.2, 0.8$	31.19	52.90	62.31	72.49	30.51	51.51	61.56	73.53	31.66	53.86	63.16	74.49
$0.3, 0.7$	31.07	52.75	62.69	72.98	29.91	51.38	61.33	72.95	31.59	53.42	63.21	74.51
$0.4, 0.6$	31.29	52.51	62.83	73.15	29.46	51.02	60.91	72.42	31.47	53.50	62.92	73.79
$0.5, 0.5$	31.86	52.37	63.06	73.29	29.39	50.88	60.39	72.17	31.55	53.48	63.19	73.64
$0.6, 0.4$	31.73	52.72	62.77	73.19	29.20	50.67	60.04	71.63	31.30	52.94	63.20	73.68
$0.7, 0.3$	31.91	52.62	62.88	73.62	28.87	50.23	59.92	71.35	31.28	53.16	62.87	73.72
$0.8, 0.2$	31.37	52.46	63.05	73.24	28.60	50.07	59.45	71.17	30.91	52.89	62.00	73.65
$0.9, 0.1$	31.27	52.42	63.06	73.28	28.28	49.48	59.06	70.99	30.55	53.08	62.02	73.79

Table 3: Matching rate(%) in "VIPeR + i-LIDS $\rightarrow$ 3DPeS" with different weights assigned to different source datasets.

Assigned weights	$\gamma = 0.8$				$\gamma = 0.2$				$\gamma = 0.5$			
	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$
$0.5, 0.1, 0.4$	30.32	51.77	61.23	72.48	28.80	49.43	60.15	71.73	30.24	51.71	61.56	72.67
$0.2, 0.5, 0.3$	30.57	52.34	61.34	72.49	29.08	48.83	59.58	71.48	30.24	51.59	61.79	73.04
$0.4, 0, 0.6$	30.34	51.08	60.94	72.17	29.74	51.07	61.44	72.85	31.16	52.48	63.16	74.01
$0.2, 0.3, 0.5$	30.44	51.76	61.67	72.25	29.32	49.39	59.68	71.74	30.28	51.69	61.53	73.29
$0.5, 0.4, 0.1$	30.03	51.72	61.02	72.51	28.52	48.39	58.61	70.56	30.22	51.00	61.58	72.77
$0.2, 0.4, 0.4$	30.47	51.87	61.54	72.58	29.02	48.93	59.72	71.90	30.37	51.86	61.68	73.20
$0.3, 0.7, 0$	30.22	51.92	61.33	73.11	28.15	47.80	58.04	70.16	30.05	50.32	61.41	72.53
$0.3, 0.6, 0.1$	30.09	51.74	61.42	73.03	28.16	47.59	57.96	70.06	29.68	49.93	61.58	72.43
$0.3, 0.4, 0.3$	30.57	52.09	61.61	72.38	29.09	49.10	59.80	71.44	30.43	51.66	61.88	73.13
$0.6, 0.2, 0.2$	30.18	51.82	61.14	72.57	28.61	48.71	59.05	71.18	30.36	51.24	61.63	72.25
$0, 0.6, 0.4$	30.52	52.68	61.60	72.75	28.49	48.58	58.77	70.72	30.35	51.17	61.64	72.92
$0.5, 0.3, 0.2$	30.24	51.93	61.49	72.50	28.80	48.84	59.24	71.15	30.35	51.54	61.46	72.32
$0.6, 0.3, 0.1$	30.10	51.70	60.92	72.49	28.43	48.34	58.69	70.84	30.26	51.38	61.66	72.37
$0.4, 0.5, 0.1$	29.98	51.96	61.40	72.78	28.19	47.90	58.30	70.21	30.22	50.29	61.58	72.34
$0.4, 0.2, 0.4$	30.41	51.65	61.07	72.21	29.22	49.53	60.08	72.12	30.12	51.34	61.33	73.09
$0.3, 0.5, 0.2$	30.82	51.98	61.36	72.56	28.75	48.59	59.13	70.98	30.33	51.48	62.03	73.11
$0.4, 0.3, 0.3$	30.35	51.74	61.30	72.41	28.99	49.11	59.44	71.37	30.16	51.34	61.28	72.33
$0.5, 0.2, 0.3$	30.33	51.74	61.20	72.41	28.97	49.35	59.87	71.64	30.42	51.53	61.32	72.76
$0.1, 0.6, 0.3$	30.31	52.48	61.37	72.67	28.58	48.39	58.83	71.06	30.19	51.16	61.51	73.21
$0.4, 0.4, 0.2$	30.74	51.55	61.37	72.46	28.92	49.20	59.31	70.96	30.61	51.69	61.85	72.85

Table 4: Matching rate(%) in "VIPeR+CAVIAR+i-LIDS$\rightarrow$3DPeS" with different weights assigned to different source datasets.

Methods	$p = 3$				$p = 4$				$p = 5$			
	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$
cAMT-DCA	**35.92**	**56.91**	**70.07**	**82.05**	**35.42**	**59.36**	**69.73**	**84.12**	**34.52**	**60.54**	**70.05**	**83.95**
LFDA-Mix	31.27	51.99	64.58	79.64	30.09	51.97	62.73	79.75	25.35	44.32	56.92	74.28
LMNN-Mix	29.26	48.51	61.61	75.22	28.76	48.85	60.77	76.00	28.98	49.07	61.84	75.78
KISSME-Mix	27.09	44.22	56.08	74.33	27.98	44.33	56.92	74.83	28.42	44.83	58.77	77.24
LADF-Mix	15.23	39.53	55.40	73.08	16.35	40.74	58.04	73.08	17.46	40.68	57.59	72.80
PCCA-Mix	23.34	47.07	62.29	77.01	22.84	48.25	64.87	77.63	23.84	49.15	65.48	79.63
TCA	11.94	28.72	38.97	59.27	15.31	29.16	40.81	60.40	13.46	26.17	40.80	62.32
TFLDA	0.78	3.19	9.57	26.65	0.62	3.25	11.31	27.77	1.73	4.88	10.25	20.98
MT-LMNN	31.05	52.76	62.62	77.35	30.43	51.48	63.07	76.95	29.60	51.26	63.58	77.62
GPLMNN	31.05	51.93	63.69	77.23	30.10	50.81	63.30	76.73	29.76	50.41	62.74	77.29

Table 5: cAMT-DCA vs. others: matching rate(%) in “CAVIAR→i-LIDS”, with respect to different number p of target training images for each person.

Methods	$p = 3$				$p = 4$				$p = 5$			
	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$	$r = 1$	$r = 5$	$r = 10$	$r = 20$
cAMT-DCA	**33.66**	**55.45**	**65.25**	**76.09**	**33.51**	**55.88**	**65.64**	77.46	**33.22**	**56.84**	**66.19**	77.36
LFDA-Mix	28.00	48.80	59.77	71.04	27.76	49.37	60.60	71.25	27.71	49.98	60.05	71.24
LMNN-Mix	26.28	45.55	55.95	67.76	26.19	45.88	56.08	67.86	26.45	45.37	56.01	67.76
KISSME-Mix	30.73	53.03	62.73	73.89	31.55	54.70	64.99	76.48	31.87	55.75	65.61	76.97
LADF-Mix	12.87	34.25	47.19	63.17	13.49	32.98	46.08	63.32	13.65	33.74	47.28	63.83
PCCA-Mix	25.24	48.80	61.03	74.59	25.69	51.49	65.49	**78.84**	26.58	53.24	65.70	**78.74**
TCA	14.38	28.50	37.21	49.19	13.71	27.62	36.55	47.67	13.61	27.07	36.51	48.94
TFLDA	17.08	33.19	43.43	55.61	21.92	39.61	50.46	62.19	20.82	37.06	48.23	61.21
MT-LMNN	28.18	50.32	60.84	71.31	27.52	49.28	59.65	70.23	27.52	48.46	59.23	70.43
GPLMNN	27.94	48.70	59.37	70.57	27.36	48.03	58.19	69.44	27.27	47.59	58.23	69.70

Table 6: cAMT-DCA vs. others: matching rate(%) in “VIPeR→3DPeS”, with respect to different number p of target training images for each person.

complex problem to solve. Fortunately, our experiments here suggest that assigning normalized equal weights is still an acceptable setting, since the matching rate varies in a small range albeit different weights assigned to source datasets.

2 Effect of Number of Target Training Samples

The matching rates against different numbers of target training samples p per person on “CAVIAR→i-LIDS” and “ VIPeR →3DPeS” are shown in Table 5 and Table 6. In most of the cases, the proposed method outperforms other methods using exactly the same training set. This further shows that the proposed cAMT-DCA could still be a preferable choice when more training samples are available in the target dataset.

3 Examples of Matching Results

The examples of the matching results by our method, LFDA-Mix, and MT-LMNN over the same probe image, in “VIPeR→CAVIAR” are shown in Fig. 1. The Re-ID results of a sample set of probe images using cAMT-DCA on “CAVIAR→i-LIDS”, “VIPeR→CAVIAR”, and “VIPeR→3DPeS”, are shown in Fig. 2, Fig. 3 and Fig. 4, respectively.

Figure 1: Sample results of Person Re-ID in VIPeR→CAVIAR over the same probe image using cAMT-DCA (top row), LFDA-Mix (middle row) and MT-LMNN (bottom row). In each row, the left-most is the probe image; images in the middle are the top 10 matched gallery images, with a red box highlighting the correct match, and the right-most shows the ground truth.

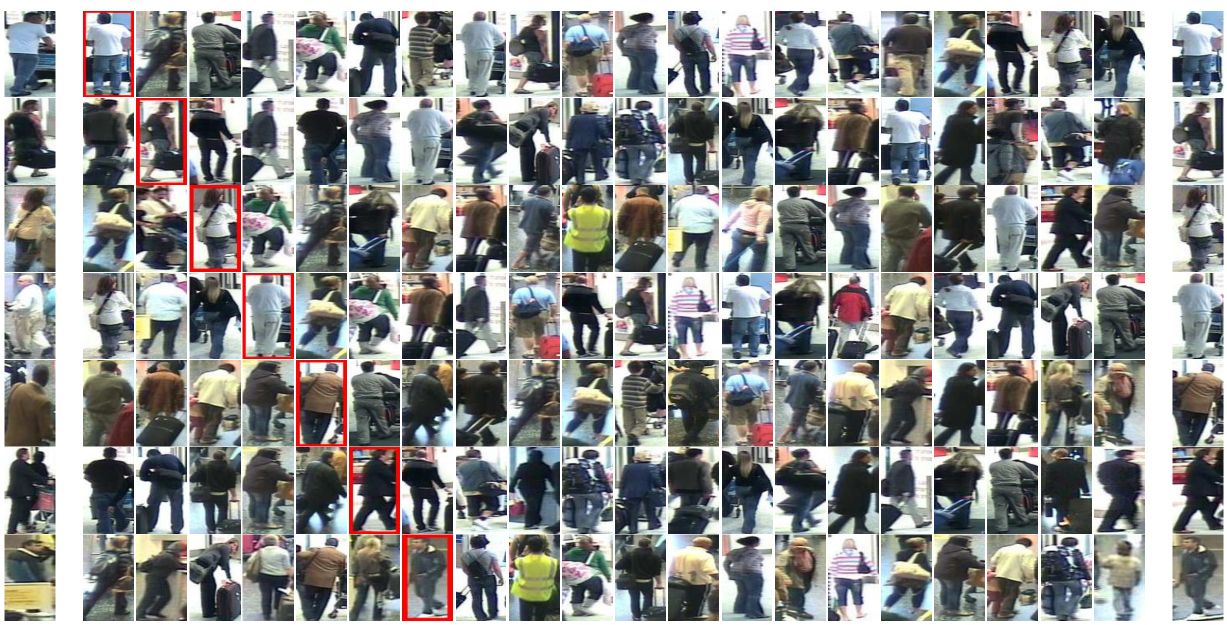

Figure 2: Sample results of Person Re-ID in CAVIAR→i-LIDS using cAMT-DCA. In each row, the left-most is the probe image, images in the middle are the top 20 matched gallery images, with a red box highlighting the correct match, and the right-most shows the ground truth.

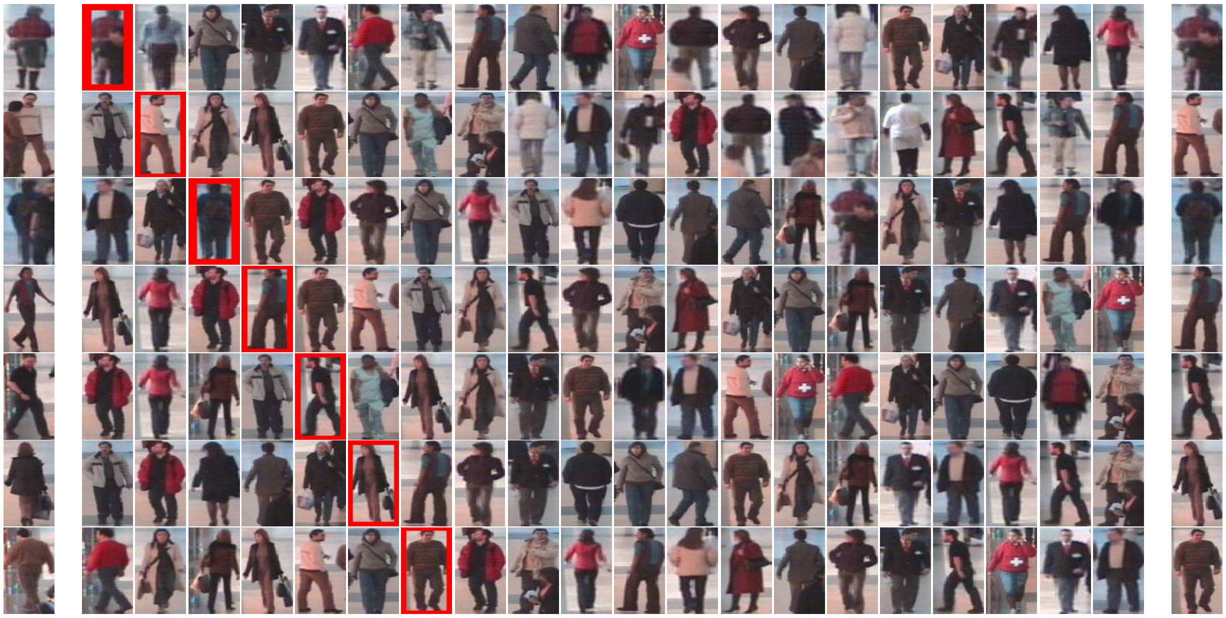

Figure 3: Sample results of Person Re-ID in VIPeR→CAVIAR using cAMT-DCA. In each row, the left-most is the probe image, images in the middle are the top 20 matched gallery images, with a red box highlighting the correct match, and the right-most shows the ground truth.

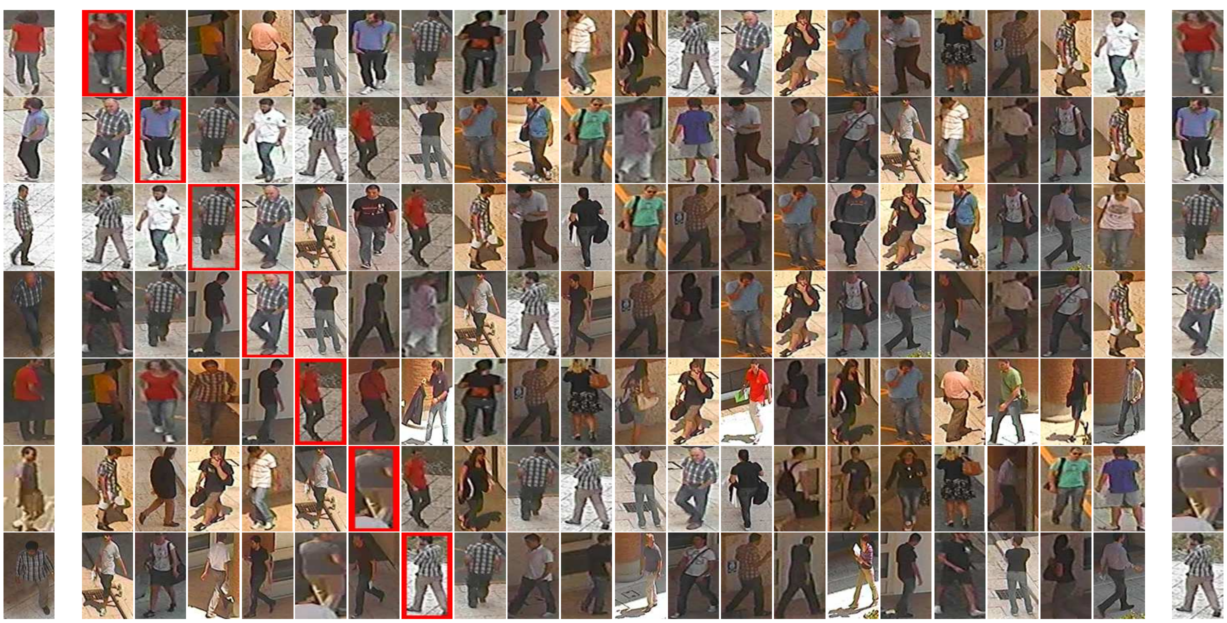

Figure 4: Sample results of Person Re-ID in VIPeR→3DPeS using cAMT-DCA. In each row, the left-most is the probe image; images in the middle are the top 20 matched gallery images, with a red box highlighting the correct match, and the right-most shows the ground truth.