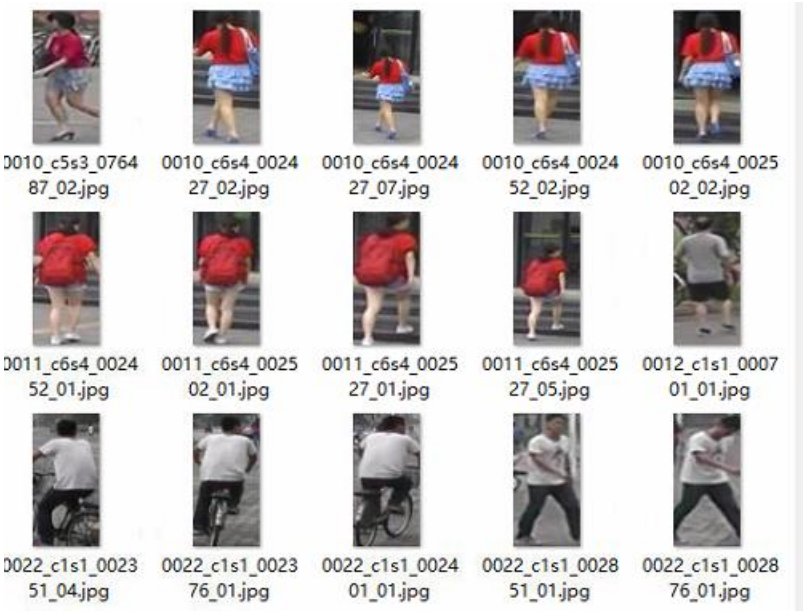
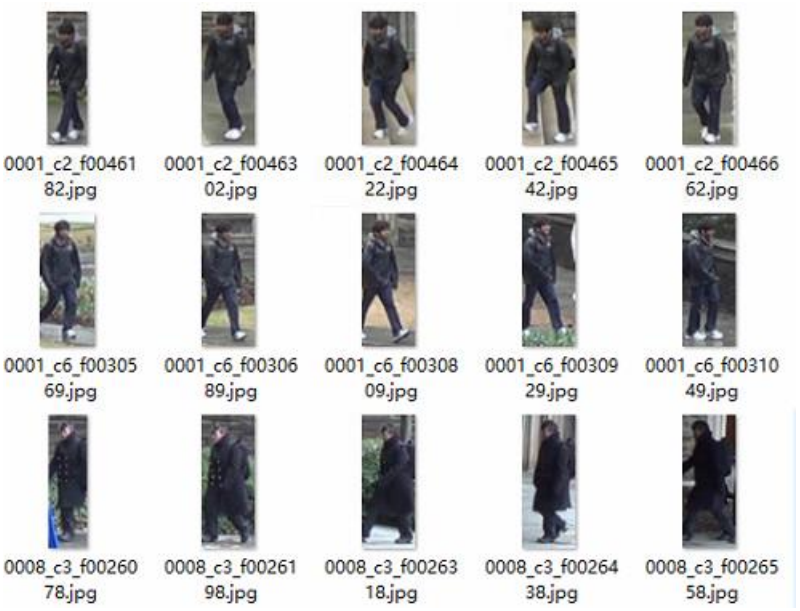
行人重识别跨域问题：EANet



Market-1501



DukeMTMC-ReID

解决跨域方法：

- 1. 风格迁移

CVPR2018 Image-Image Domain Adaptation with Preserved Self-Similarity and Domain-Dissimilarity for Person Re-identification

CVPR2018 Person Transfer GAN toBridge Domain Gap for Person Re-Identification

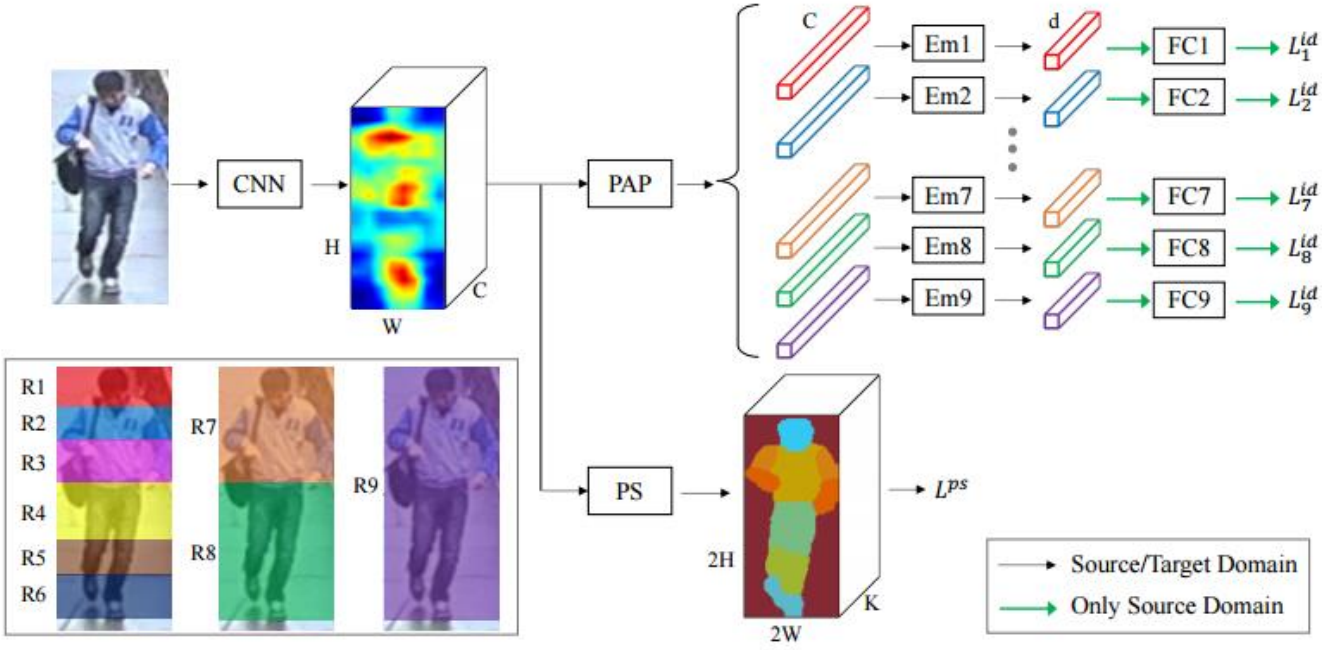
- 2. 在目标域进行无监督学习

CVPR2019 Invariance Matters Exemplar Memory for Domain Adaptive

CVPR2019 Unsupervised Person re-identification by Soft Multi-label Learning

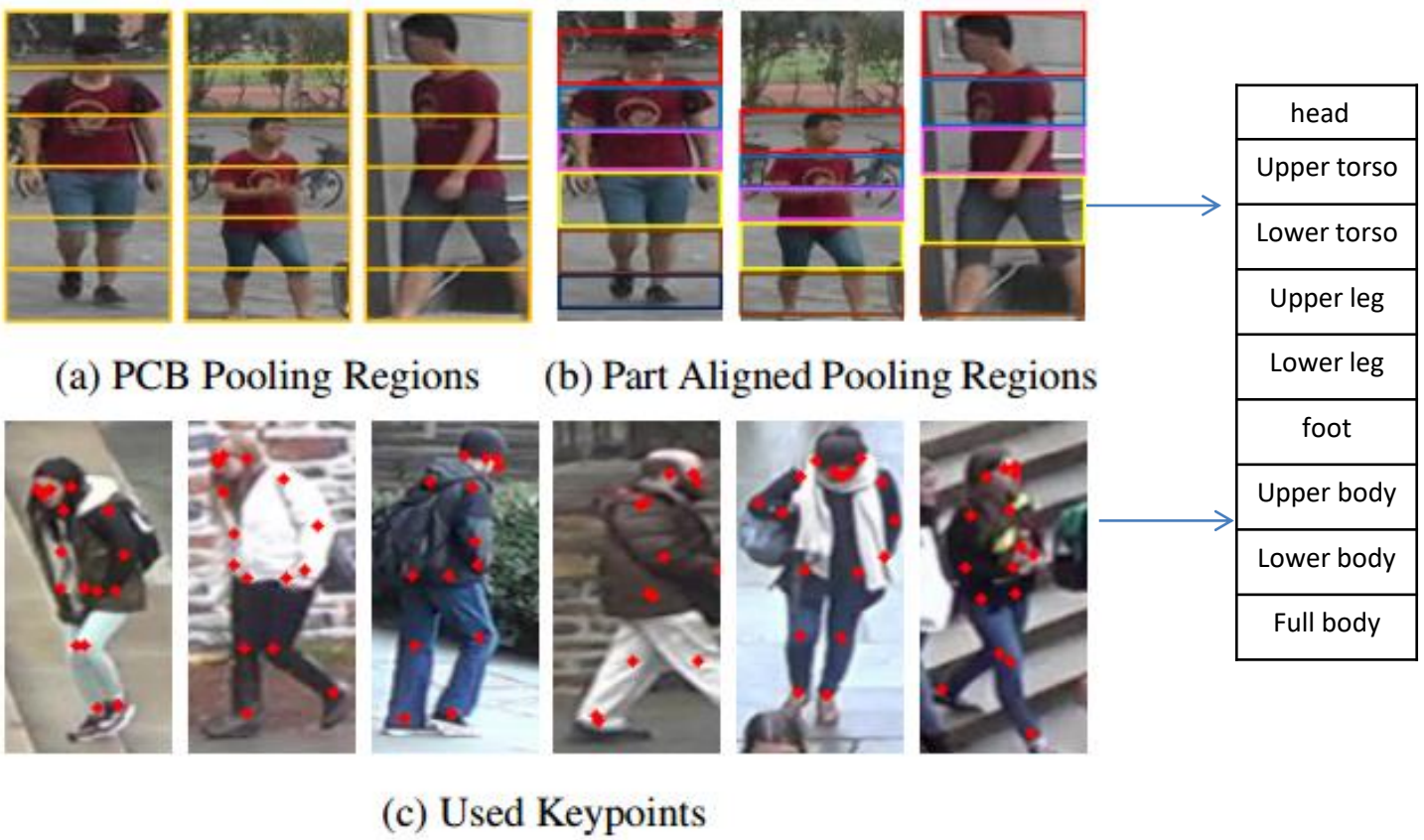
- 3. 在目标域进行辅助的监督学习

EANet——主要思路



- 部分对齐池化（PAP: Part Aligned Pooling）
- 部分分割约束（PS Constraint）

部分对齐池化（PAP: Part Aligned Pooling）



Y. Sun, L. Zheng, Y. Yang, Q. Tian, and S. Wang. Beyond part models: Person retrieval with refined part pooling. In ECCV, 2018 https://arxiv.org/abs/1711.09349

为什么需要PS Constraint？

- Conv5的神经元感受野超级大
- 每个部件的id约束非常强
- 对于部件对齐的性能有影响
- 不同区域得到的特征之间冗余度较高

部分分割约束（PS Constraint）

(a) COCO Densepose Part Annotations (Fused into 7 Parts)

(b) Pseudo Part Labels on ReID Datasets

实验结果： PCB vs PAP

	M-C	M-D	C-M	C-D	D-M	D-C
PCB	8.9(7.8)	42.9(23.8)	52.1(26.5)	29.2(15.2)	56.5(27.7)	8.4(6.9)
PAP	11.4(9.9)	46.4(27.9)	55.5(30.0)	34.0(17.9)	59.5(30.6)	9.7(8.0)

	MS-MS	MS-M	MS-C	MS-D
PCB	73.7(46.5)	59.1(31.1)	14.1(14.1)	58.0(39.1)
PAP	79.7(53.4)	63.3(35.1)	16.0(15.8)	63.8(43.7)

M(Market1501) C (CUHK03) D(DukeMTMC-reID) MS(MSMT17)

实验结果：PAP+PS

	M→M	C→C	D→D	M→C	M→D	C→M	C→D	D→M	D→C
PAP	94.4 (84.5)	72.0 (66.2)	86.1 (73.3)	11.4 (9.9)	46.4 (27.9)	55.5 (30.0)	34.0 (17.9)	59.5 (30.6)	9.7 (8.0)
PAP-S-PS-SA	94.5 (85.7)	71.4 (66.2)	86.9 (74.2)	13.6 (11.7)	50.2 (30.9)	58.4 (32.9)	38.4 (20.6)	60.6 (31.9)	11.1 (9.5)
PAP-S-PS	94.6 (85.6)	72.5 (66.8)	87.5 (74.6)	14.2 (12.8)	51.4 (31.7)	59.4 (33.3)	39.3 (22.0)	61.7 (32.9)	11.4 (9.6)
PAP-ST-PS	-	-	-	21.4 (19.0)	56.1 (36.0)	66.4 (40.6)	45.0 (26.4)	66.1 (35.8)	15.6 (13.8)

实验结果：和现有跨域方法的互补性

- 风格迁移的方法：SPGAN
- 预测为标签的方法：CFT

	M→D	D→M
PCB	42.9 (23.8)	56.5 (27.7)
PCB-SPGAN	48.0 (28.4)	61.9 (31.1)
PAP-S-PS	51.4 (31.7)	61.7 (32.9)
PAP-S-PS-SPGAN	56.2 (35.5)	67.7 (37.3)
PAP-ST-PS	56.1 (36.0)	66.1 (35.8)
PAP-ST-PS-SPGAN	61.5 (39.4)	69.6 (39.3)
PAP-ST-PS-SPGAN-CFT	67.7 (48.0)	78.0 (51.6)

论文代码复现

- EANet：https://github.com/huanghoujing/EANet

```
numpy==1.14.3
opencv-python==3.4.4.19
scipy==1.1.0
torch==1.0.0
easydict==1.9
torchvision==0.2.1
tqdm==4.28.1
Pillow==5.3.0
scikit-learn==0.18.1
tensorboardX==1.5
```

```
market1501
    Market-1501-v15.09.15               # Extracted from Market-1501-v15.09.15.zip, http://www.liangzheng.org/Project/project_reid.html
    Market-1501-v15.09.15_ps_label
    bounding_box_train_duke_style
    im_path_to_kpt.pkl
cuhk03_np_detected_jpg
    cuhk03-np                       # Extracted from cuhk03-np.zip, https://pan.baidu.com/s/1RNvebTccjmmj1ig-LVjw7A
    cuhk03-np-jpg_ps_label
    im_path_to_kpt.pkl
duke
    DukeMTMC-reID                   # Extracted from DukeMTMC-reID.zip, https://github.com/layumi/DukeMTMC-reID_evaluation
    DukeMTMC-reID_ps_label
    bounding_box_train_market1501_style
    im_path_to_kpt.pkl
msmt17
    MSMT17_V1                       # Extracted from MSMT17_V1.tar.gz, https://www.pkuvmc.com/publications/msmt17.html
    MSMT17_V1_ps_label
    im_path_to_kpt.pkl
partial_reid
    Partial-REID_Dataset            # Extracted from Partial-REID_Dataset.rar, http://isee.sysu.edu.cn/files/resource/Partial-REID_Dataset.rar
partial_ilids
    Partial_iLIDS                   # Provided by https://github.com/lingxiao-he/Partial-Person-ReID
coco
    images
    masks_7_parts
    im_name_to_kpt.pkl
    im_name_to_h_w.pkl
```

论文代码复现

- 在Market1501上训练PAP方法的EANet
- 修改package/config/default.py 的配置文件

```
17 cfg.model.pool_type = 'PAPool'  # ['GlobalPool', 'PCBPool', 'PAPool']
```

- Conda到安装完配置环境的environment下，cd到模型保存地址，输入
  python -m package.optim.eanet_trainer --exp_dir exp/eanet/PAP/market1501 --cfg_file package/config/default.py --ow_file paper_configs/PAP.txt --ow_str "cfg.dataset.train.name = 'market1501'"

```
(tensorflow_gpuenv) C:\Users\Jd\Desktop\EANet>  python -m package.optim.eanet_trainer --exp_dir exp/eanet/PAP/market1501
 --cfg_file package/config/default.py --ow_file paper_configs/PAP.txt --ow_str "cfg.dataset.train.name = 'market1501'"
[PYTHONPATH]:
```