Person re-identification

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Table of Contents

1 DB:

Data set	Camera number	Image number	Identity number	Size	FPS	Time	Notes
☑ DukeMTMC-reID http://vision.cs.duke.edu/DukeMTMC/ (Evaluation page/Matlab code): https://github.com/layumi/DukeMTMC-reID_evaluation • **Person_reID_baseline_pytorch** https://github.com/layumi/Person_reID_baseline_pytorch	8	16,522 training images of 702 identities, 2,228 query images of the other 702 identities and 17,661 gallery images (702 ID + 408 distractor ID).	702 IDs as the training set and the remaining 702 IDs as the testing set 23.5 images/ID	1080p	60	85 mins	☐ DukeMTMC-Pose: https://github.com/layumi/DukeMTMC-Pose DukeMTMC-attribute:https://github.com/vana77/DukeMTMC-attribute Annotated 23 human-level attributes : ☐

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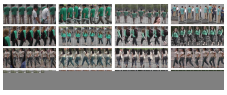
(Pytorch/ Provide baseline code and DB processing code) on DukeMTMC-reID: **Rank@1=64.23%, mAP=43.92%.** on Market-1501: **Rank@1=90.20% mAP=84.76%**							
Duke MTMC4ReID https://github.com/NEU-Gou/DukeReID (Matlab code for evaluation)	8	22,515 bounding boxes from 72×34 pixels to 415×188 pixels	1,413				

Data set	Camera number	Image number	Identity number	Size	FPS	Time	Notes
Market-1501 http://www.liangzheng.org/Project/project_reid.html	6 5 high-resolution cameras, and one low-resolution	12,936 training images of 751 identities, 19,732 test images of 750 identities bboxes 25,259	1501 IDs 17.2 images/ID				 **State of the art on the Market-1501 dataset**: http://www.liangzheng.org/Project/state_of_the_art_market1501.html
CUHK03 http://www.ee.cuhk.edu.hk/~xgwang/CUHK_identification.html	2	13164 images, manually cropped + automatically detected	1360 identities				
CUHK02	2	7264 images, manually cropped	1816 identities				미확보
CUHK01	2	3884 images, manually cropped	971 identities				미확보

Data set	Camera number	Image number	Identity number	Size	FPS	Time	Notes
MARS (Motion Analysis and Re-identification Set) http://www.liangzheng.com.cn/Project/project_mars.html *Extension of the Market-1501 *Video sequences	6 (5HD, 1SD)	tracklets 20,478, bboxes 1,191,003, distractors 3,248	1,261 identities				 **State of the art on the MARS dataset**: http://www.liangzheng.com.cn/Project/state_of_the_art_mars.html
CUHK-SYSU http://www.ee.cuhk.edu.hk/~xgwang/PS/dataset.html ***Person search**	1 hand-held cam and movie snapshots	18,184 images 11,206 training images of 5,532 IDs 6,978 test images of 2,900 IDs	8,432 identities				미확보 -→ 확보! Dataset is available upon request (sli [at] ee.cuhk.edu.hk[1]) **code:** https://github.com/ShuangLI59/person_search

1 http://ee.cuhk.edu.hk

Data set	Camera number	Image number	Identity number	Size	FPS	Time	Notes
PRW (Person Re-identification in the Wild) http://www.liangzheng.com.cn/Project/project_prw.html	6	11,816 frames, bboxes 34,304	932 identities				
iLIDS Video re-IDentification (iLIDS-VID) *Video sequences http://www.eecs.qmul.ac.uk/~xiatian/downloads_qmul_iLIDS-VID_ReID_dataset.html	2	600 sequences	300 identities				미확보-→ 확보!

2 References:

2.1 **Image based:**

Supervised Learning:

1. "Person re-identification: Past, Present and Future", Liang Zheng, Yi Yang, Alexander Hauptmann, Arxiv 2016
2. "A Systematic Evaluation and Benchmark for Person Re-Identification: Features, Metrics, and Datasets", Richard J. Radke, Arxiv 2016
3. "In Defense of the Triplet Loss for Person Re-Identification", Alexander Hermans, Lucas Beyer and Bastian Leibe, Arxiv 2017.
4. "Dual Mutual Learning", Ying Zhang, Tao Xiang, Timothy Hospedales, Huchuan Lu, CVPR 2018.
5. "Pedestrian Alignment Network for Person Re-identification", Liang Zheng, Zhedong Zheng, Yi Yang, Arxiv 2017.
6. "Random Erasing Data Augmentation", Zhun Zhong, Liang Zheng, Guoliang Kang, Shaozi Li, Yi Yang, Arxiv 2017.
7. "CamStyle Augmentation", Zhun Zhong, Liang Zheng, Zhedong Zheng, Shaozi Li , Yi Yang, CVPR 2018.
8. "Margin Sample Mining Loss: A Deep Learning Based Method for Person Re-identification",Qiqi Xiao, Hao Luo, Chi Zhang, Arxiv 2017.
9. "Let Features Decide for Themselves: Feature Mask Network for Person Re-identification",Guodong Ding, Salman Khan, Zhenmin Tang, Fatih Porikli, Arxiv 2017.
10. "Improving person re-identification by attribute and identity learning", Yutian Lin, Liang Zheng, Zhedong Zheng, Yu Wu, Yi Yang, Arxiv 2017.(DB[2])
11. "SVDNet for Pedestrian Retrieval",Yifan Sun, Liang Zheng, Weijian Deng, Shengjin Wang, ICCV 2017.(code[3]/Caffe)
12. "Joint Detection and Identification Feature Learning for Person Search**",** Tong Xiao, Shuang Li, Bochao Wang, Liang Lin, Xiaogang Wang,CVPR 2017.(code[4]/Caffe)
13. "Person Re-identification in the Wild",Liang Zheng, Hengheng Zhang, Shaoyan Sun, Manmohan Chandraker, Yi Yang, Qi Tian,CVPR 2017.(code[5]/Matlab)
14. "Learning Deep Feature Representations with Domain Guided Dropout for Person Re-identification"**,**Tong Xiao, Hongsheng Li, Wanli Ouyang, Xiaogang Wang,CVPR 2016.(code[6]/Caffe)
15. "AligendReID:Surpassing Human Level Performance in Person Re-Identification",Jian Sun, Arxiv 2017.(code[7]/Pytorch)
16. "Re-ID done right: towards good practices for person re-identification[8]", Jon Almazan, Bojana Gajic, Naila Murray, Diane Larlus, Arxiv 2018.

Unsupervised Learning:

1. "Unsupervised Person Re-identification: Clustering and Fine-tuning", Hehe Fan, Liang Zheng and Yi Yang, Arxiv 2017.(code[9]/tensforflow/)
2. "Image-Image Domain Adaptation with Preserved Self-Similarity and Domain-Dissimilarity for Person Re-identification", Weijian Deng, Liang Zheng, Guoliang Kang, Yi Yang, Qixiang Ye, Jianbin Jiao, CVPR 2018.

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2 https://github.com/vana77/DukeMTMC-attribute
3 https://github.com/syfafterzy/SVDNet-for-Pedestrian-Retrieval
4 https://github.com/ShuangLI59/person_search
5 https://github.com/liangzheng06/PRW-baseline
6 https://github.com/Cysu/dgd_person_reid
7 https://github.com/huanghoujing/AlignedReID-Re-Production-Pytorch
8 https://arxiv.org/abs/1801.05339
9 https://github.com/hehefan/Unsupervised-Person-Re-identification-Clustering-and-Fine-tuning

3. "Transferable Joint Attribute-Identity Deep Learning for Unsupervised Person Re-Identification", Jingya Wang, Xiatian Zhu, Shaogang Gong, Wei Li, CVPR 2018.

GAN based:

1. "Unlabeled Samples Generated by GAN Improve the Person Re-identification Baseline in vitro", Arxiv 2017.
2. "Person Transfer GAN to Bridge Domain Gap for Person Re-Identification",Arxiv 2017.

Transfer learning based:

1. "Deep Transfer Learning for Person Re-identification",Arxiv 2016.

2.2 **Video based:**

1. Multi-shot Person Re-identification using Part Appearance Mixture.[10] WACV 2017.
2. Person Re-Identification by Unsupervised Video Matching. PR 2017.[11]
3. Person Re-Identification by Discriminative Selection in Video Ranking. PAMI 2016.[12]
4. Person Re-Identification by Video Ranking. [13] ECCV 2014.
5. Top-push Video-based Person Re-identification.[14] CVPR 2016.
6. Recurrent Convolutional Network for Video-Based Person Re-Identification.[15] CVPR 2016.
7. A Spatio-Temporal Appearance Representation for Viceo-Based Pedestrian Re-Identification.[16] ICCV 2015.
8. Deep Recurrent Convolutional Networks for Video-based Person Re-identification: An End-to-End Approach. [17] Arxiv 2016.
9. Jointly Attentive Spatial-Temporal Pooling Networks for Video-based Person Re-Identification.[18] ICCV 2017.

10 http://www-sop.inria.fr/members/Francois.Bremond/Postscript/furqanWACV17.pdf
11 http://www.eecs.qmul.ac.uk/~xiatian/papers/PR16/MaEtAl_PR2017.pdf
12 http://www.eecs.qmul.ac.uk/~xiatian/papers/TPAMI16/WangEtAl_PAMI2016.pdf
13 http://www.eecs.qmul.ac.uk/~xiatian/papers/ECCV14/WangEtAl_ECCV14.pdf
14 http://www.cv-foundation.org/openaccess/content_cvpr_2016/html/You_Top-Push_Video-Based_Person_CVPR_2016_paper.html
15 http://www.cv-foundation.org/openaccess/content_cvpr_2016/html/McLaughlin_Recurrent_Convolutional_Network_CVPR_2016_paper.html
16 http://www.cv-foundation.org/openaccess/content_iccv_2015/papers/Liu_A_Spatio-Temporal_Appearance_ICCV_2015_paper.pdf
17 http://arxiv.org/pdf/1606.01609.pdf
18 https://arxiv.org/pdf/1708.02286.pdf

3 NAS address:

/users/chunfei ma/2018/ReID/

4 Evaluation metrics:

Cumulative matching characteristics(CMC top-K):

A matching is counted if there is at least one of the top-K predicted bounding boxes overlaps with the ground truths with intersection-over-union(IoU) greater or equal certain threshold(e.g., 0.5).

Mean averaged precision(mAP):

Same as object detection criterion.

5 Paper attachment:

Person Re-identif...n in the Wild.pdf

Let Features Deci...dentification.pdf

Margin Sample Mi...entification.pdf

Person re-id pas...t and future.pdf

Re-ID done right...entification.pdf

Divide and Fuse: ...dentification.pdf


Unsupervised Pe... Fine-tuning.pdf


Person Re-Identi...resentations.pdf


SVDNet for Pedes...an Retrieval.pdf


In Defense of the...dentification.pdf

Deep Mutual Learning.pdf

Pedestrian Alignm...dentification.pdf

AligendReID:Surp...entification.pdf

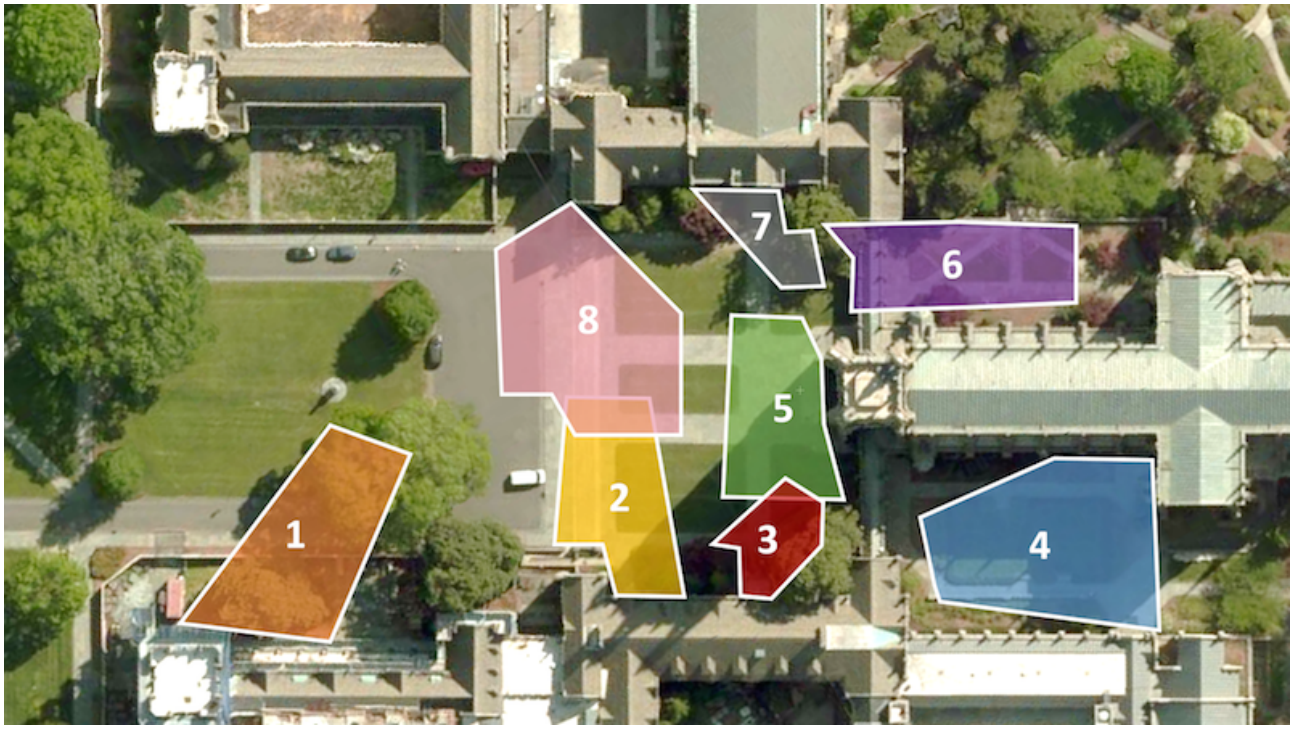
6 Video demo:

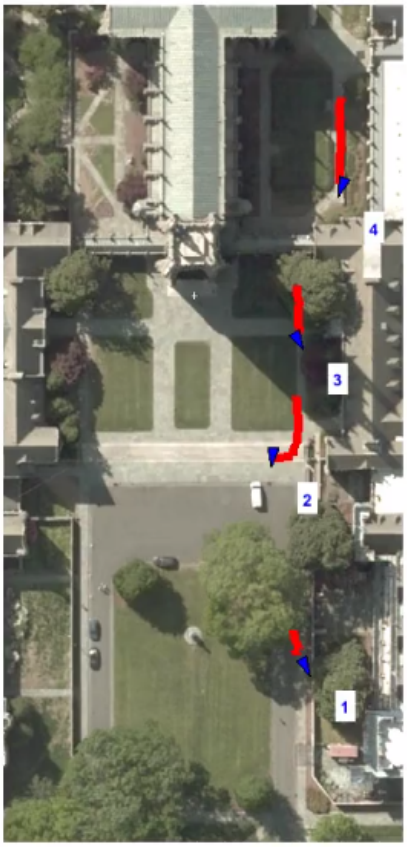

system_OK_cases.avi


system_failure_cases.avi


single_camera_output.avi

7 Scenario:

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8 R&D roadmap:

9 Papers:

9.1 **Image-based:**

AligendReID:Surpassing Human Level Performance in Person Re-Identification(CVPR 2017)

- state-of-the-art performance in re-id domain
- image-based re-id method
- open source(pytorch)

Joint Detection and Identification Feature Learning for Person Search(CVPR 2017)

- state-of-the-art performance in person search domain
- multi-task learning
- open source(caffe)

Re-ranking Person Re-identification with k-reciprocal Encoding(CVPR 2017)

- state-of-the-art re-ranking algorithm
- open source(matcaffe)

9.2 **Video-based:**

TBD.

10 Projects:

Open-ReID: Open source person re-identification library in python

- intro: Open-ReID is a lightweight library of person re-identification for research purpose. It aims to provide a uniform interface for different datasets, a full set of models and evaluation metrics, as well as examples to reproduce (near) state-of-the-art results.
- project page: https://cysu.github.io/open-reid/
- github(PyTorch): https://github.com/Cysu/open-reid
- examples: https://cysu.github.io/open-reid/examples/training_id.html
- benchmarks: https://cysu.github.io/open-reid/examples/benchmarks.html

caffe-PersonReID

- intro: Person Re-Identification: Multi-Task Deep CNN with Triplet Loss
- gtihub: https://github.com/agjayant/caffe-Person-ReID

Person_reID_baseline_pytorch

- intro: Pytorch implement of Person re-identification baseline
- arxiv: https://github.com/layumi/Person_reID_baseline_pytorch

11 PyTorch:

Practical PyTorch tutorials

- github: https://github.com/spro/practical-pytorch

The Incredible PyTorch

- github: https://github.com/ritchieng/the-incredible-pytorch

PyTorch quick start: Classifying an image

- blog: http://blog.outcome.io/pytorch-quick-start-classifying-an-image/
- ipn: https://gist.github.com/jbencook/9918217f866c1aa9967391ba62d123b5

tutorial for researchers to learn deep learning with pytorch.

https://github.com/yunjey/pytorch-tutorial