Pose Variation Adaptation for Person Re-identification

Lei Zhang, Na Jiang, Yue Xu, Qishuai Diao, Zhong Zhou and Wei Wu
State Key Lab of Virtual Reality Technology and Systems, Beihang University

Problem/Challenge

☐ Problem.

Person re-identification aims at matching pedestrians observed from non-overlapping camera views.

☐ Challenge.

(a) Pedestrian appearance variations caused by pose changing
(b) GANs aim at generating images which just look realistic.
(c) The manner of data augmentation is simply.

Contribution

☐ Pose transfer generative adversarial network.

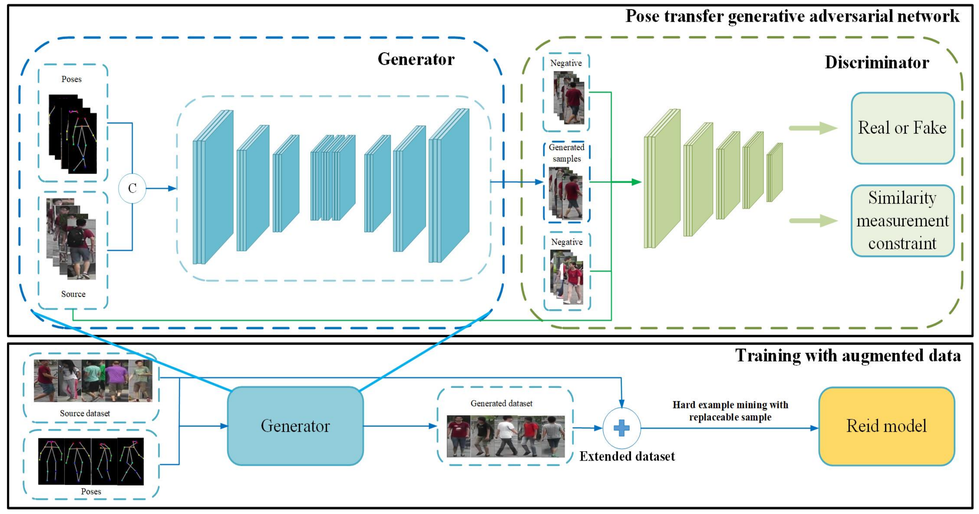
Our method learn a pose transfer GAN for synthesizing realistic images conditional on pose with considering the distance changing on pose variations.

☐ Hard Example Mining with Replaceable Sample.

Our method optimize the manner of the pose-transferred sample usage, which replaces the inferior examples caused by pose variations.

Proposed Methods

☐ Overall of our proposed framework.



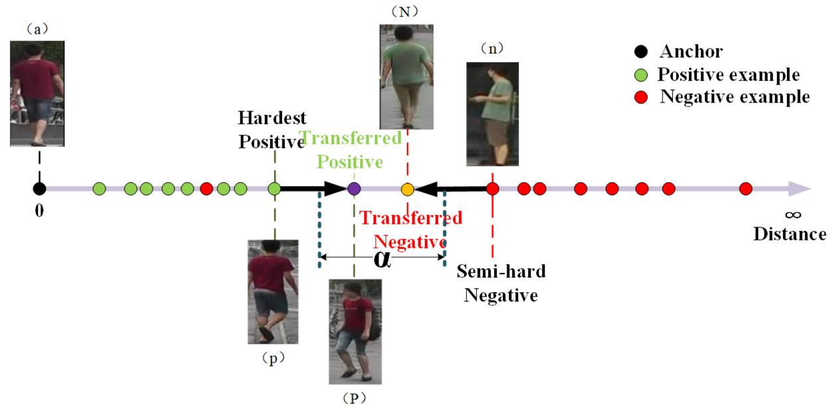
☐ Pose transfer generative adversarial network.

$$\mathcal{L}(G,D) = \mathcal{L}_{cGAN}(G,D) + \lambda_1 \mathcal{L}_{L_1} + \lambda_2 \mathcal{L}_s$$

$$\mathcal{L}_s = \mathbb{E}_{x,p\sim p_{data}}\left[\left\|f\left(x_f\right)-f\left(x_s\right)\right\|_2^2 - \left\|f\left(x_f\right)-f\left(x_n\right)\right\|_2^2 + \alpha_1\right]_+$$

$$+\mathbb{E}_{x,p\sim p_{data}}\left[\left\|f\left(x_f\right)-f\left(x_t\right)\right\|_2^2 - \left\|f\left(x_f\right)-f\left(x_s\right)\right\|_2^2 + \alpha_2\right]_+$$

☐ Hard Example Mining with Replaceable Sample.



Experiments

☐ Comparison of the generated images and real images on Market-1501.

☐ Comparison with state-of-the-art person re-id methods on Market-1501 and DukeMTMC-reID dataset.

Method	Market-1501		DukeMTMC-reid	
	Rank-1	mAP	Rank-1	mAP
XQDA	-	-	30.8	17.0
DNS	55.4	29..9	-	-
IDE	72.5	46.0	65.2	45.0
TriNet	84.9	69.1	72.4	53.5
Part-aligned	91.7	79.6	84.4	69.3
VPM	93.0	80.8	83.6	72.6
Mance	93.1	82.3	84.9	71.8
LSRO	84.0	66.1	67.7	47.1
PT	87.7	68.9	78.5	56.9
PN-GAN	89.4	72.6	73.6	53.2
Camstyle	89.5	71.6	78.3	57.6
FD-GAN	90.5	77.7	80.0	64.5
DG-net	94.8	86	86.6	74.8
Baseline	94.1	85.7	86.2	75.9
Ours	**95.7**	**88.0**	**89.9**	**78.2**
Ours+rerank	**96.1**	**94.5**	**92.0**	**89.3**