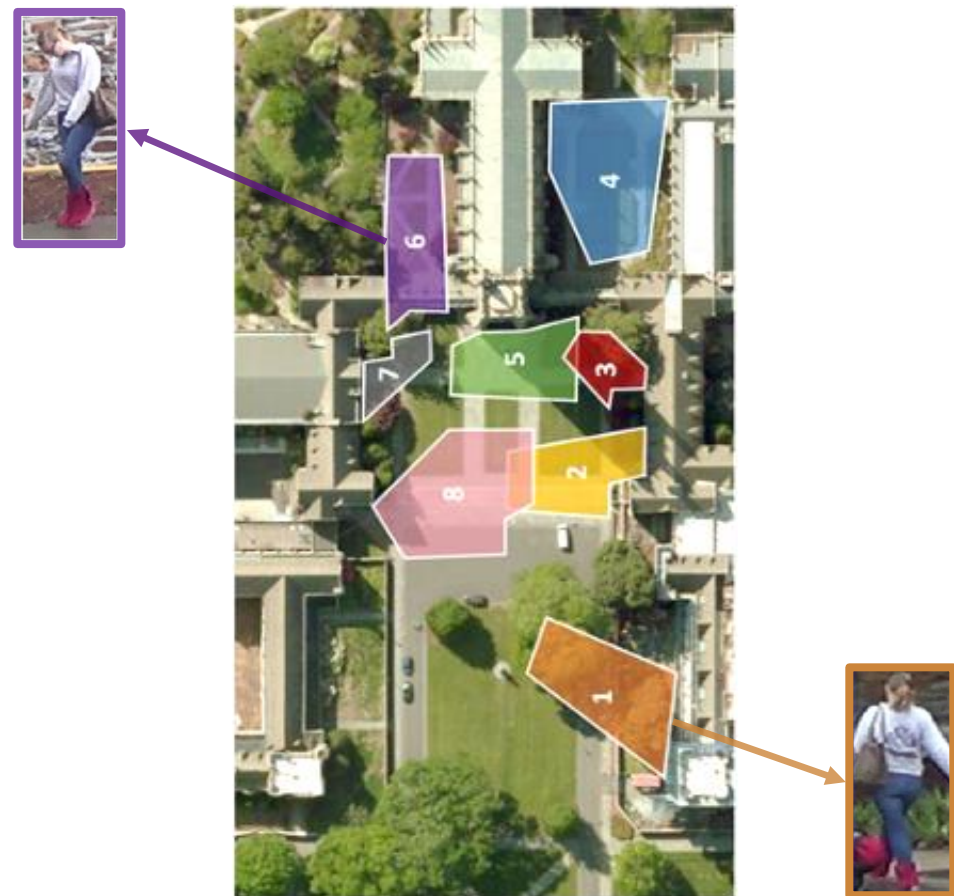




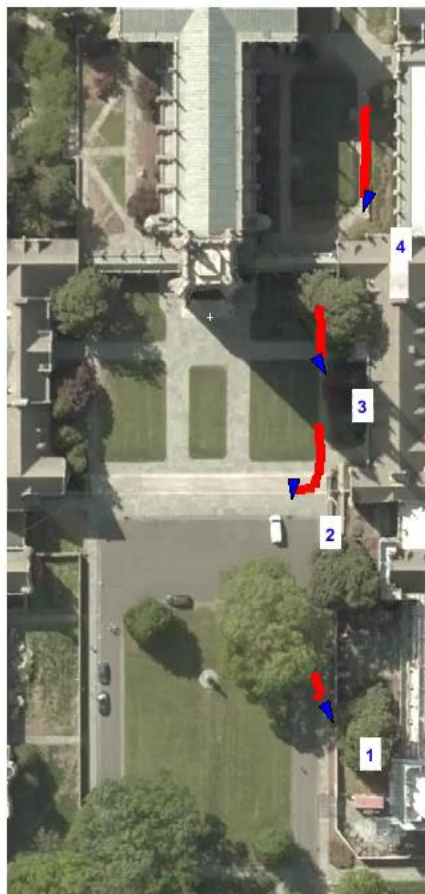
Joint Discriminative and Generative Learning for Person Re-identification

Zhedong Zheng, Xiaodong Yang, Zhiding Yu, Liang Zheng, Yi Yang, Jan Kautz

What is Person Re-identification?



What is Person Re-identification?



Appearance and Structure



Define two spaces for pedestrian images

Appearance Space	Structure Space
clothing/shoes color, texture and style, other id-related cues, etc.	body size, hair, carrying, pose, background, position, viewpoint, etc.

Image Synthesis

Synthesize images by switching appearance or structure codes

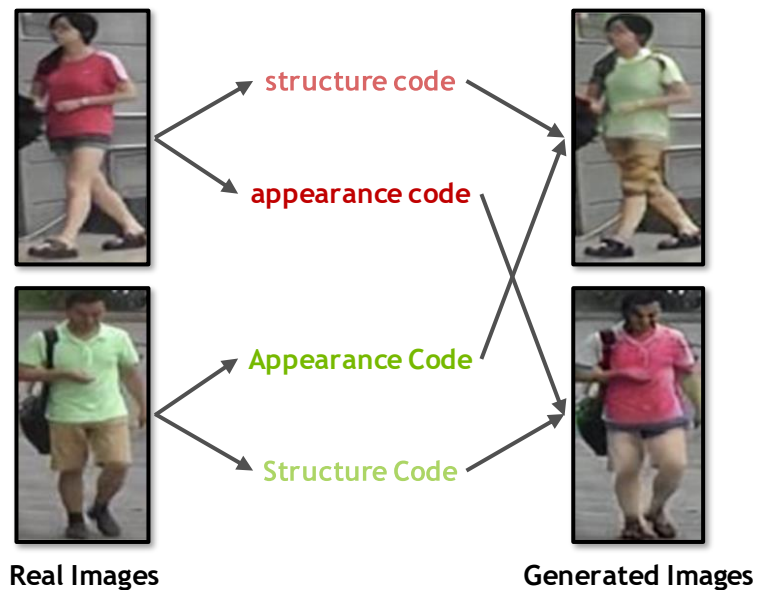


Image Synthesis

Synthesize images by switching **appearance** or **structure** codes



Image Synthesis

Synthesize images by switching **appearance** or **structure** codes



Image Synthesis

Synthesize images by switching **appearance** or **structure** codes



Image Synthesis

Synthesize images by switching **appearance** or **structure** codes



Image Synthesis

Synthesize images by switching **appearance** or **structure** codes



Image Synthesis

Synthesize images by switching **appearance** or **structure** codes



Image Synthesis

Synthesize images by switching **appearance** or **structure** codes



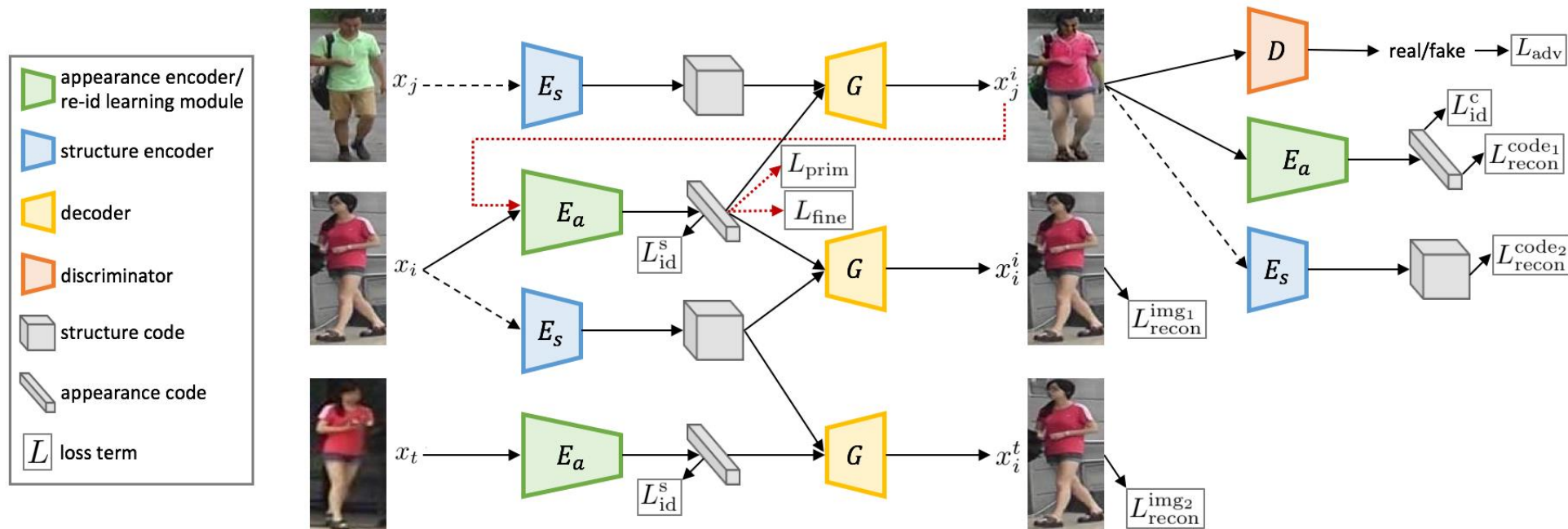
“Given N real images, we can generate $N \times N$ high-fidelity images for training.”



Appearance Interpolation

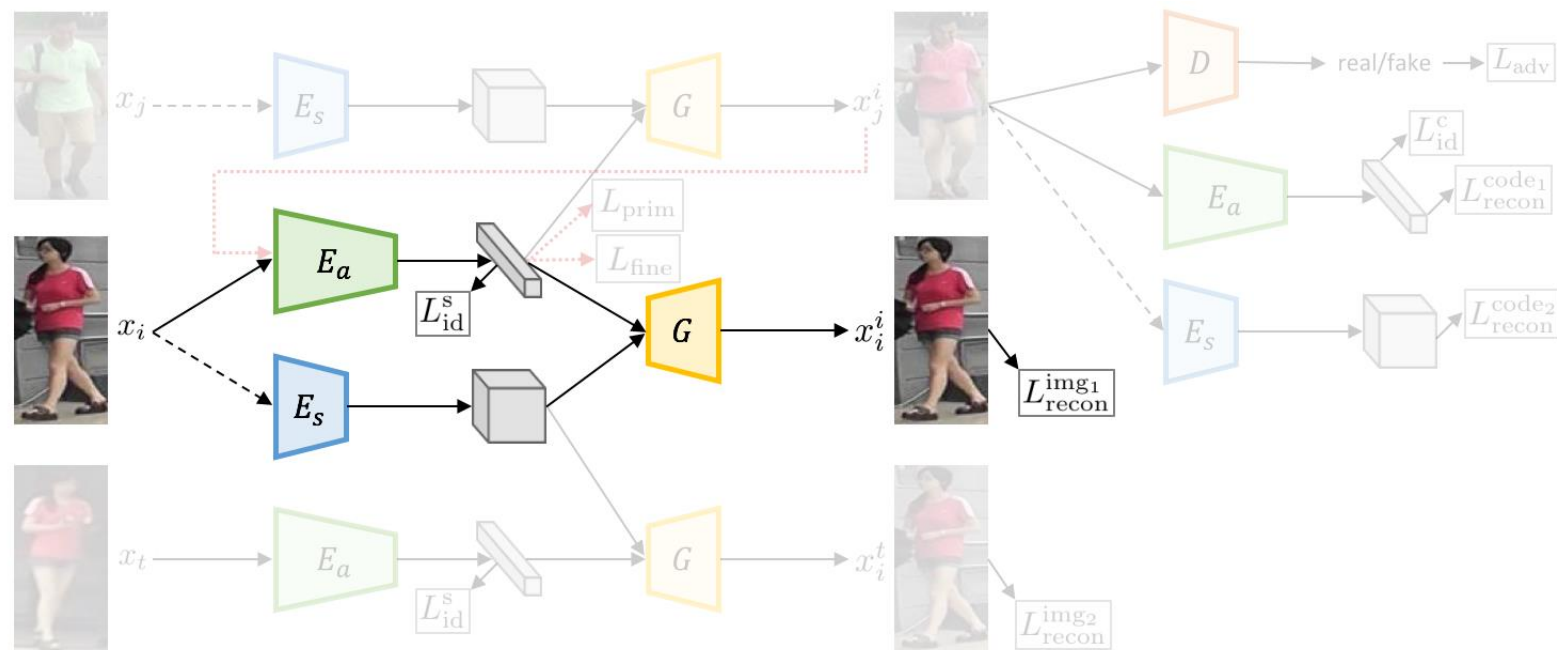
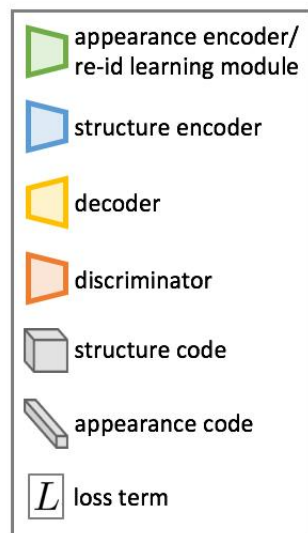


DG-Net



DG-Net

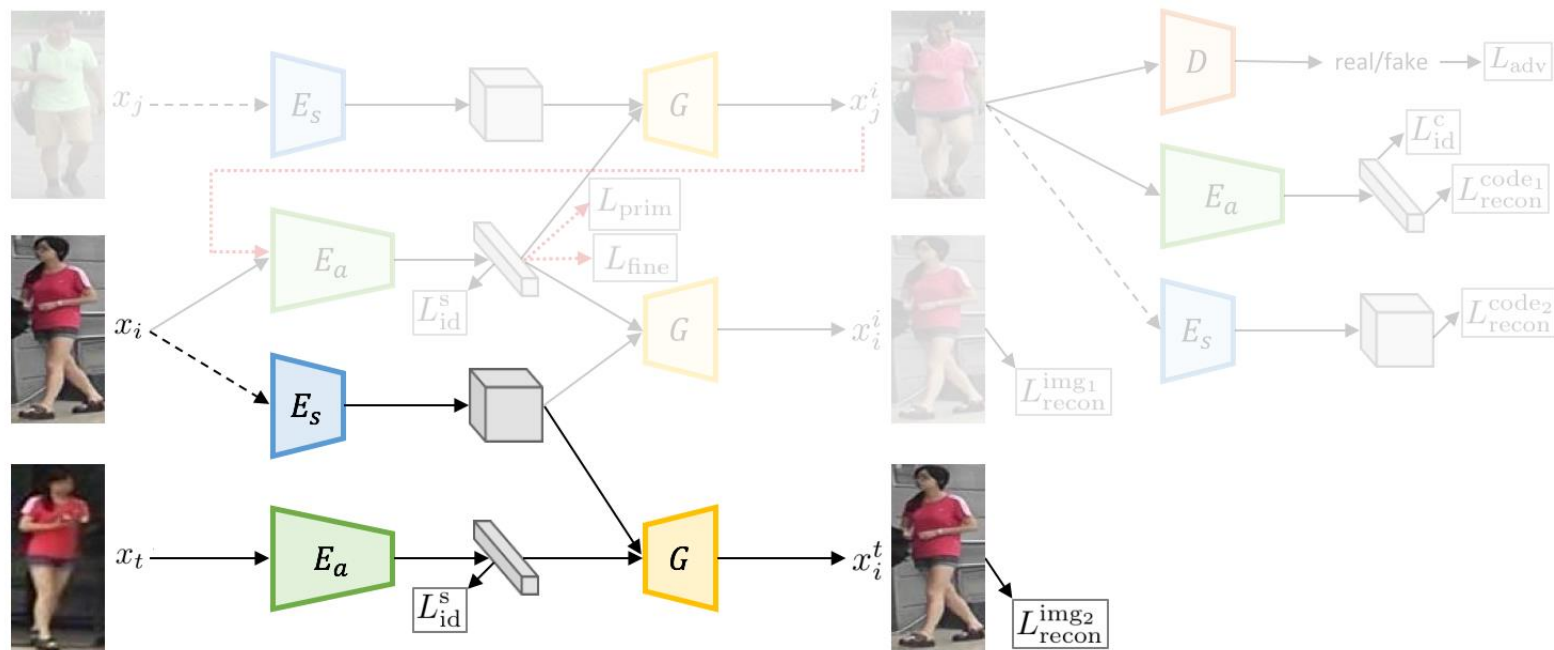
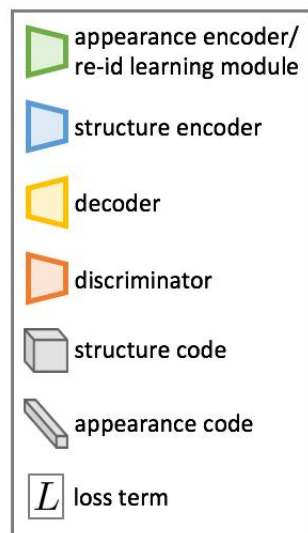
Generative Module



self-reconstruction

DG-Net

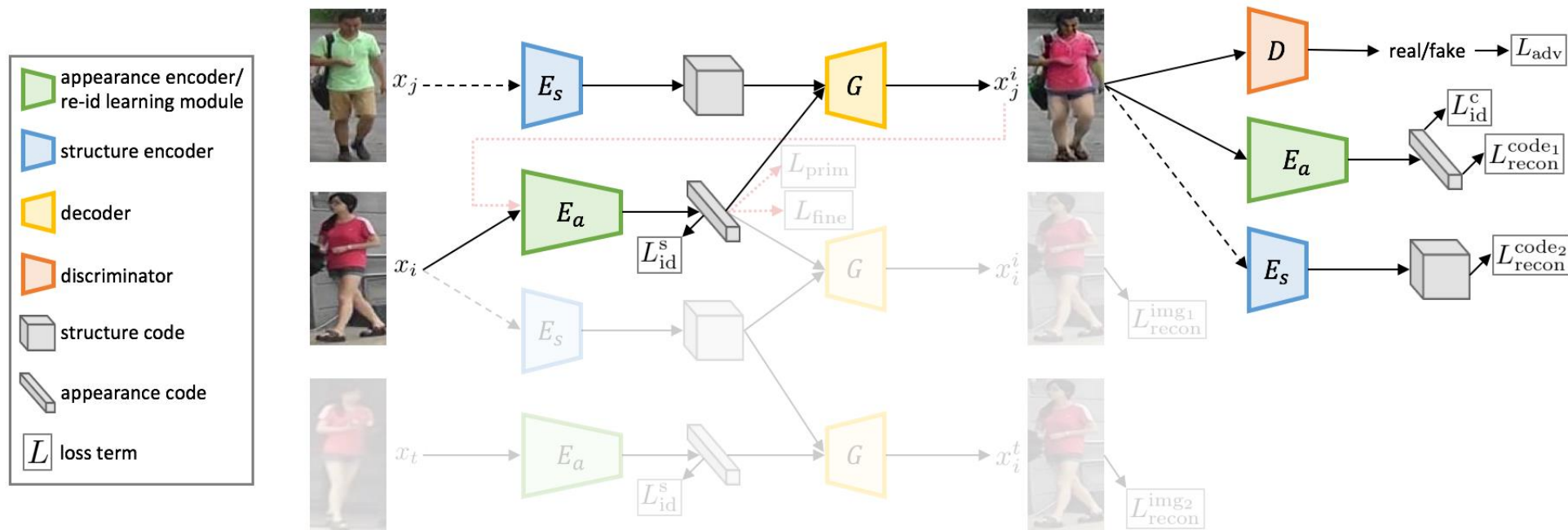
Generative Module



self-identity generation

DG-Net

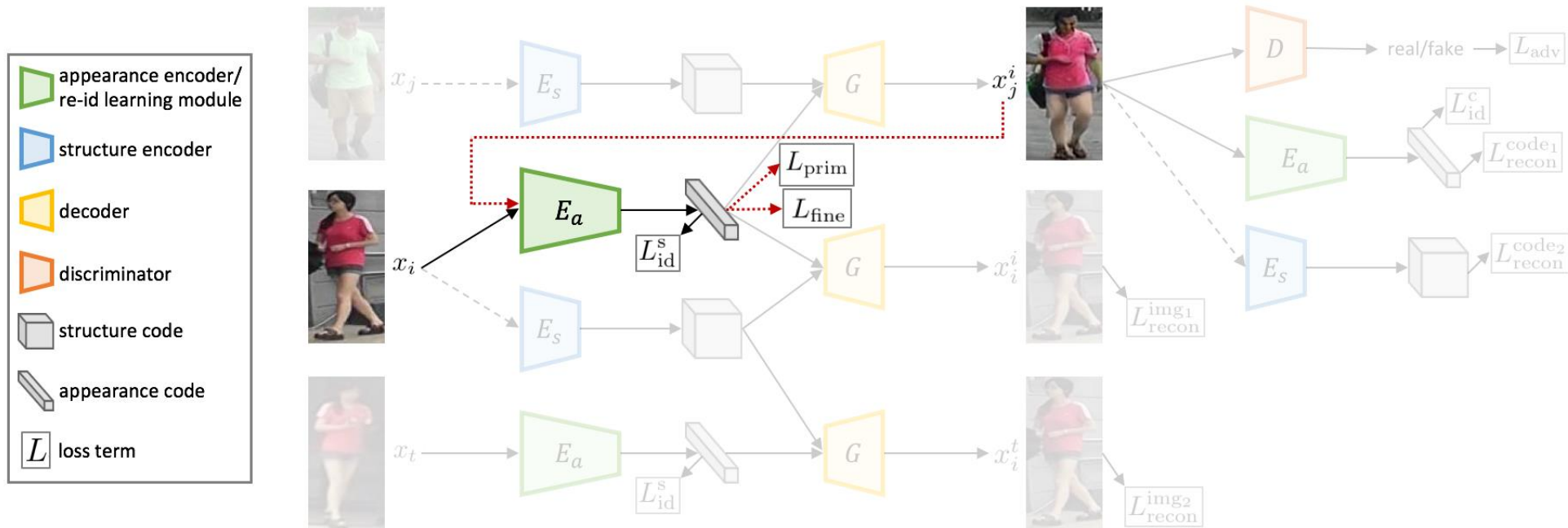
Generative Module



cross-identity generation

DG-Net

Discriminative Module



discriminative re-id learning

“We let the model see **more realistic variants** of pedestrians to boost re-id learning.”

State-of-the-Art Results

Generative Evaluations



State-of-the-Art Results

Discriminative Evaluations

Methods	Market-1501		DukeMTMC-reID	
	Rank@1	mAP	Rank@1	mAP
Verif-Identif [53]	79.5	59.9	68.9	49.3
DCF [21]	80.3	57.5	-	-
SSM [2]	82.2	68.8	-	-
SVDNet [37]	82.3	62.1	76.7	56.8
PAN [55]	82.8	63.4	71.6	51.5
GLAD [45]	89.9	73.9	-	-
HA-CNN [23]	91.2	75.7	80.5	63.8
MLFN [4]	90.0	74.3	81.0	62.8
Part-aligned [36]	91.7	79.6	84.4	69.3
PCB [38]	93.8	81.6	83.3	69.2
Manacs [41]	93.1	82.3	84.9	71.8
DeformGAN [33]	80.6	61.3	-	-
LSRO [54]	84.0	66.1	67.7	47.1
Multi-pseudo [16]	85.8	67.5	76.8	58.6
PT [26]	87.7	68.9	78.5	56.9
PN-GAN [30]	89.4	72.6	73.6	53.2
FD-GAN [9]	90.5	77.7	80.0	64.5
Ours	94.8	86.0	86.6	74.8

Comparison with the state-of-the-art results on Market-1501 and DukeMTMC-reID.

Group 1: the methods without using generated data.

Group 2: the methods using separately generated images.

Methods	Rank@1	Rank@5	Rank@10	mAP
Deep [39]	47.6	65.0	71.8	23.0
PDC [34]	58.0	73.6	79.4	29.7
Verif-Identif [53]	60.5	76.2	81.6	31.6
GLAD [45]	61.4	76.8	81.6	34.0
PCB [38]	68.2	81.2	85.5	40.4
Ours	77.2	87.4	90.5	52.3

Comparison with the state-of-the-art results on MSMT17.



See more details in our paper:

Joint Discriminative and Generative Learning for Person Re-Identification. CVPR, 2019.