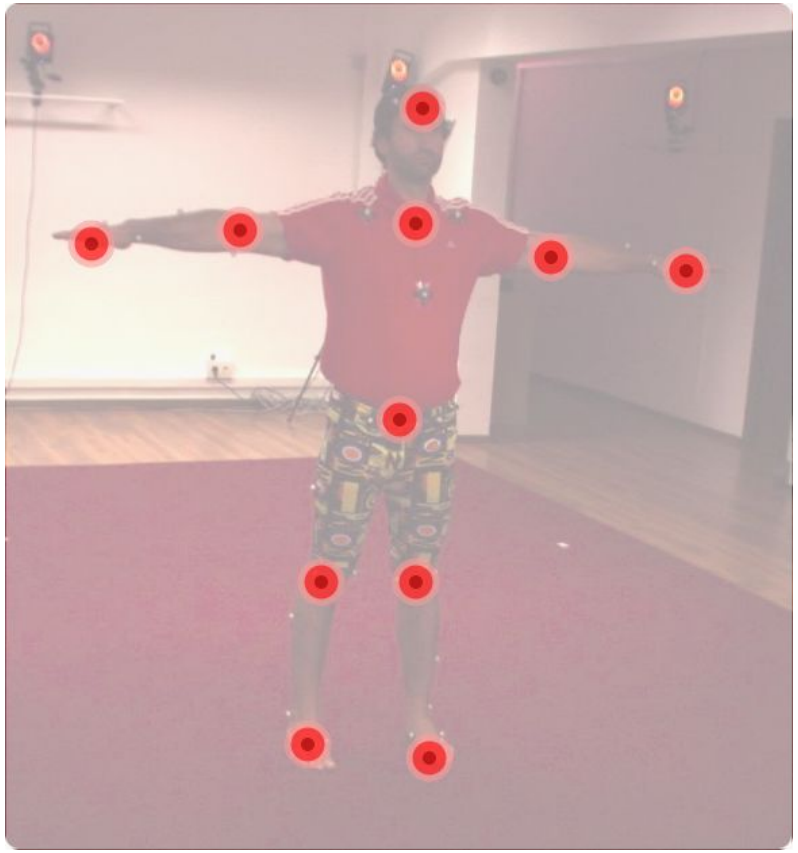
Shape Consistent 2D Keypoint Estimation Under Domain Shift

Levi O. Vasconcelos, Massimiliano Mancini, Davide Boscaini,
Samuel Rota Bulo, Barbara Caputo, Elisa Ricci

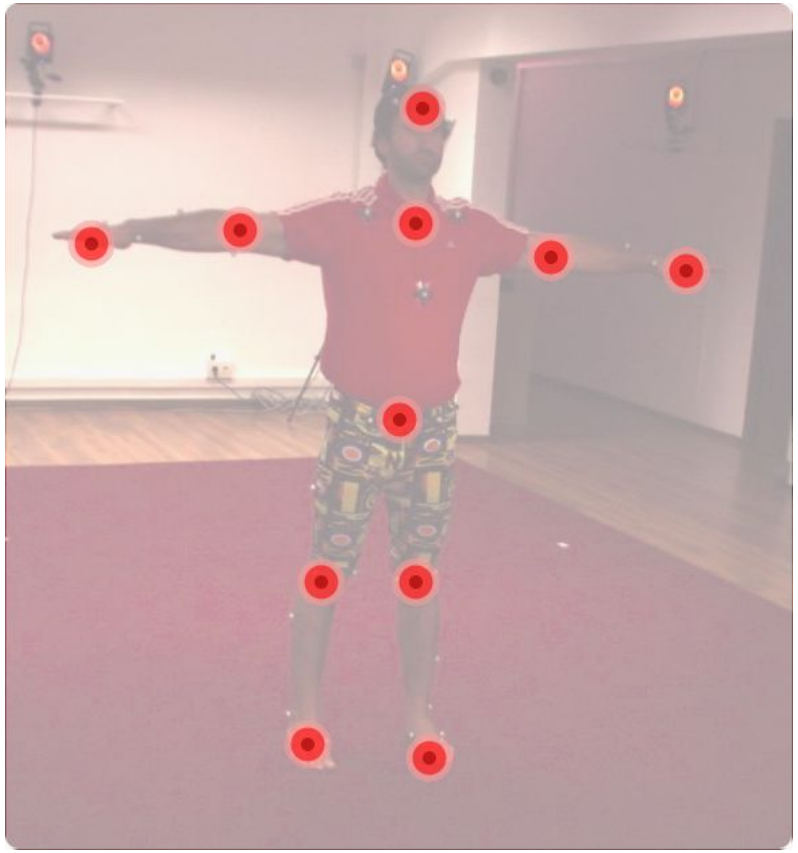
SAPIENZA UNIVERSITÀ DI ROMA
FACEBOOK
FONDAZIONE BRUNO KESSLER
POLITECNICO DI TORINO
UNIVERSITÀ DEGLI STUDI DI TRENTO
iit ISTITUTO ITALIANO DI TECNOLOGIA

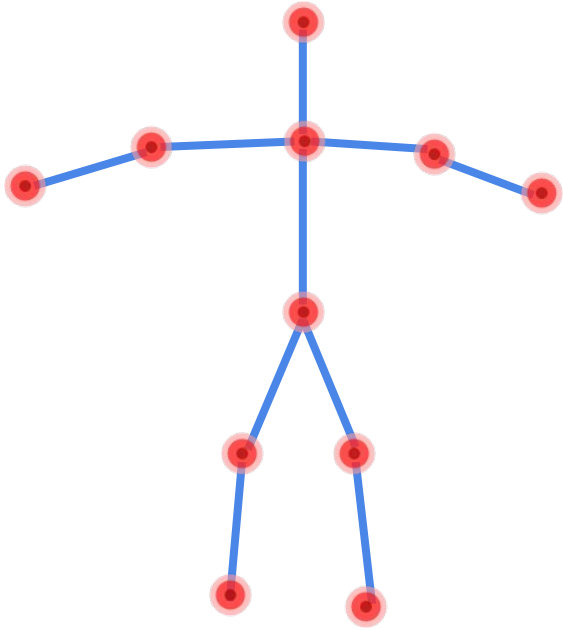
Task description

Task description

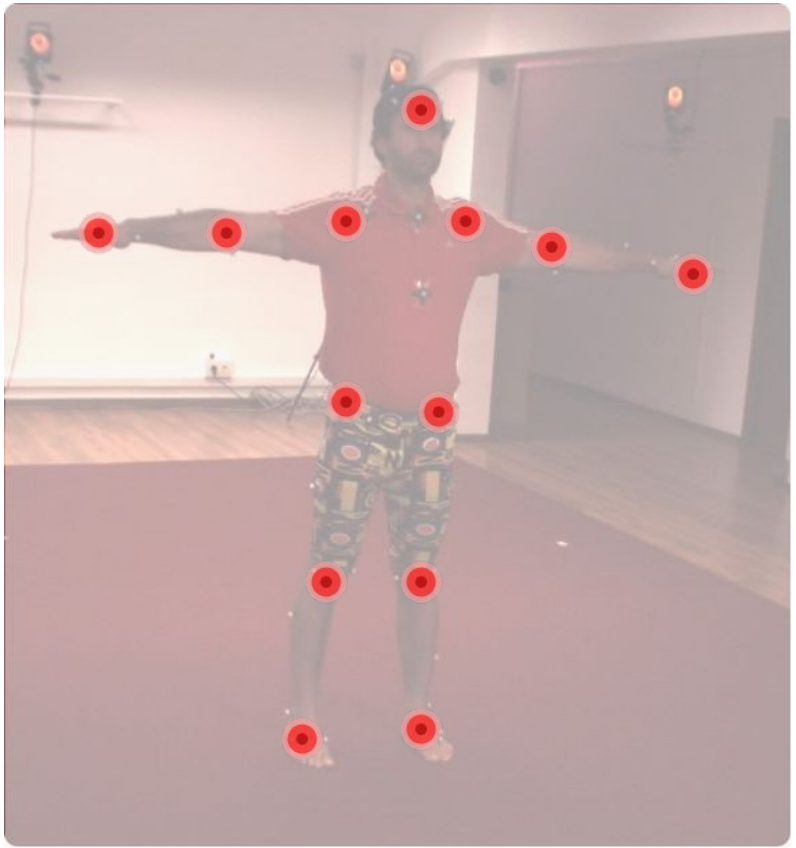


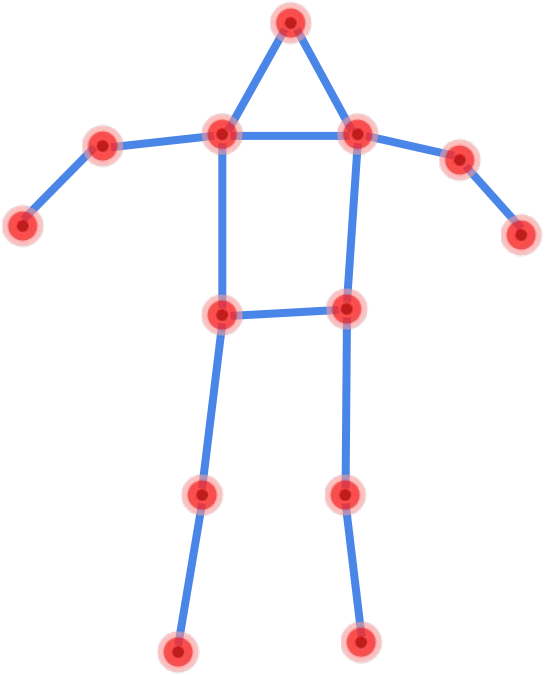
Task description





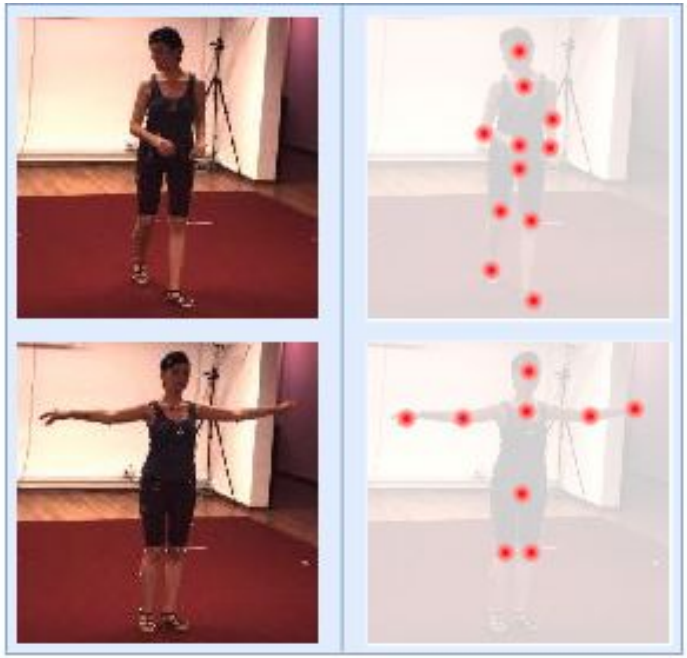
Task description



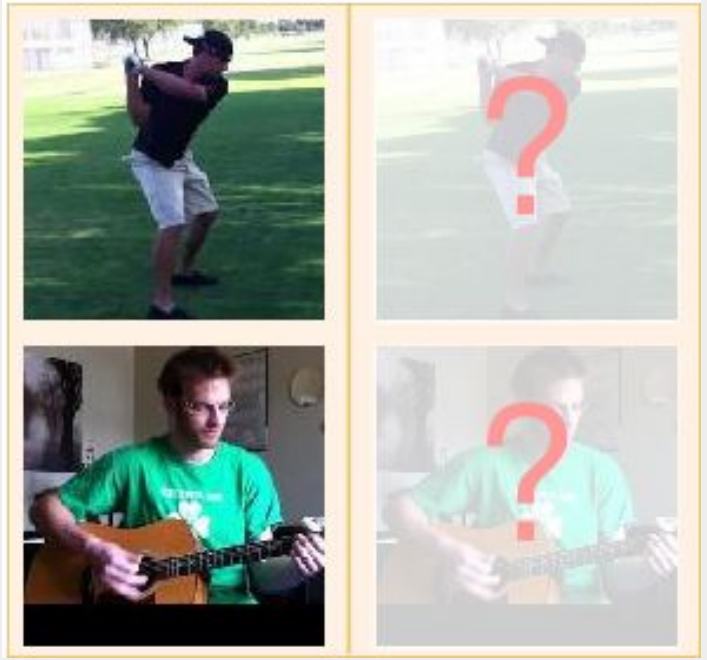


Domain shift

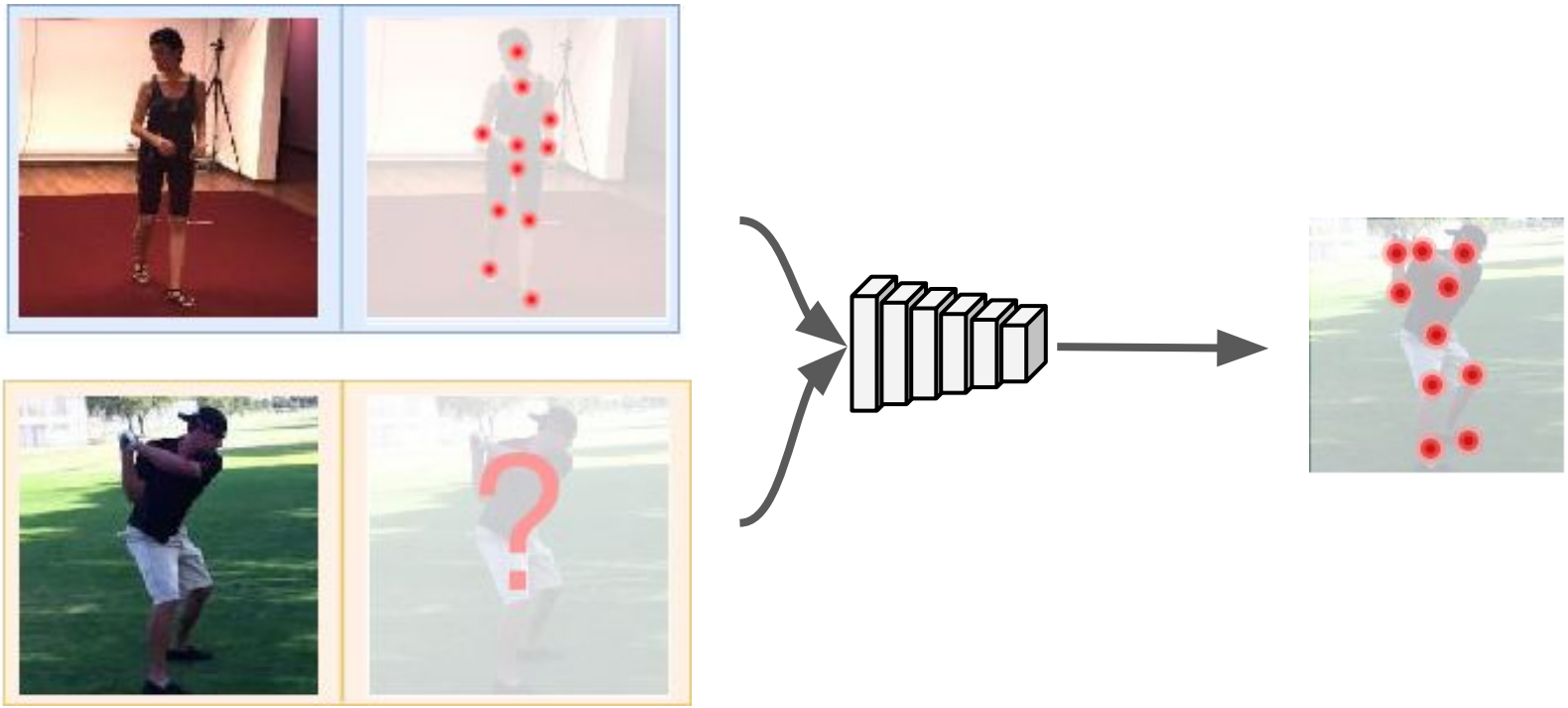
Source



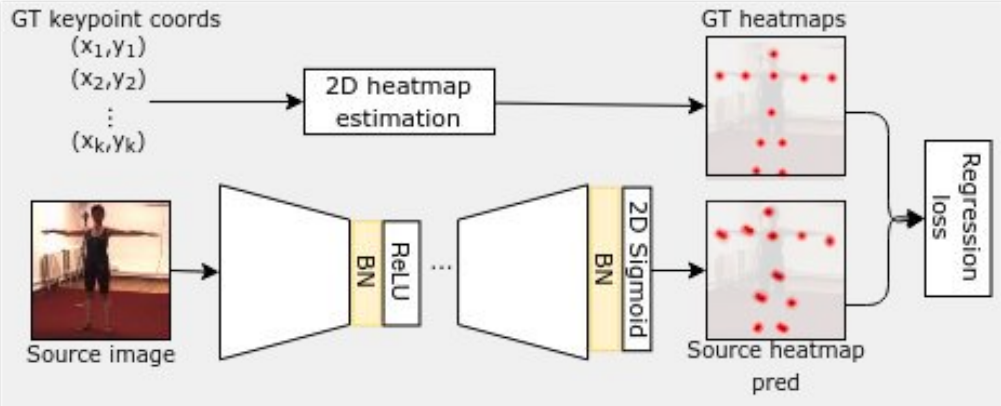
Target



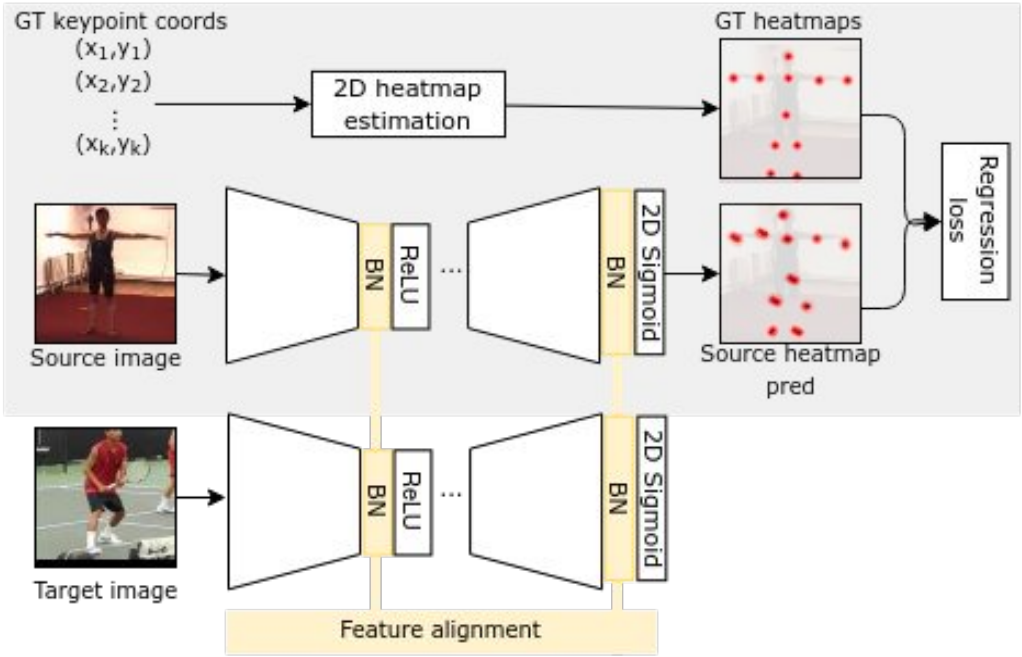
Domain Adaptation



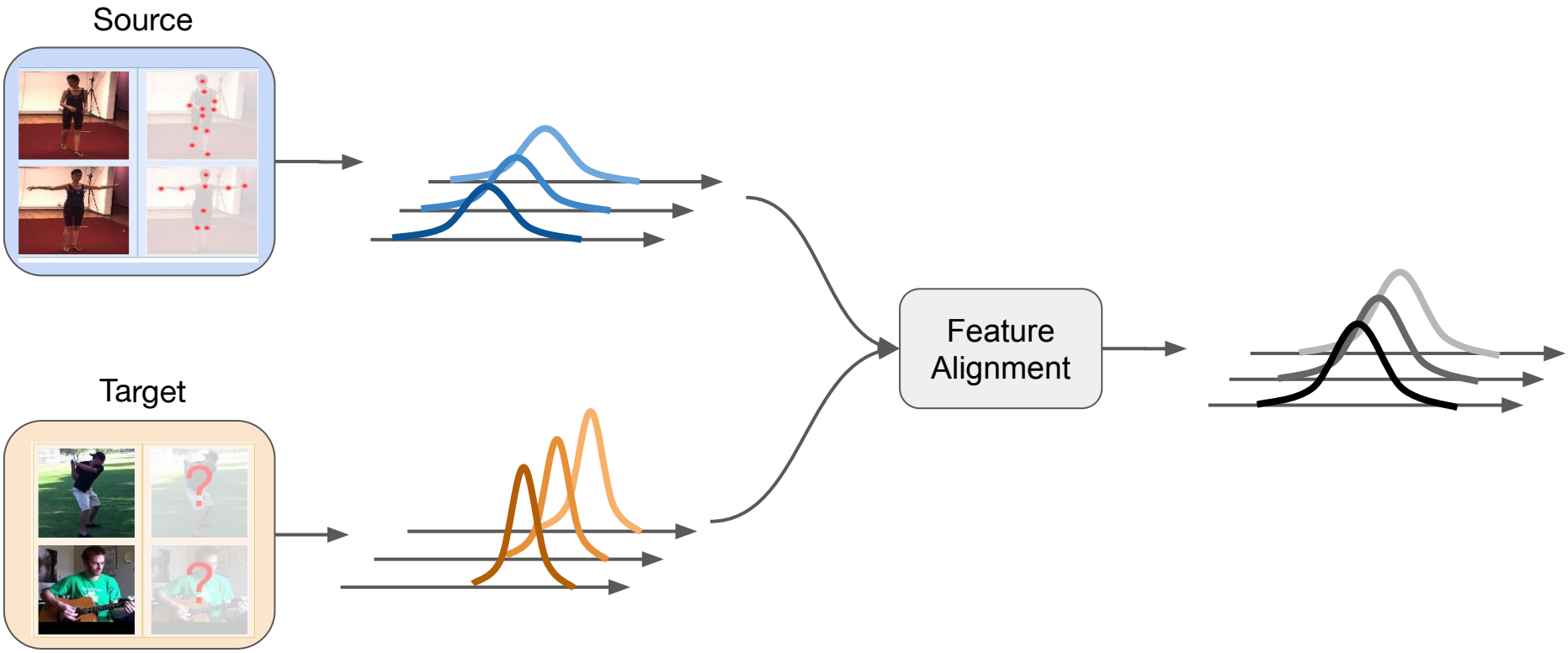
Our Method


GT keypoint coords
(x_1,y_1)
(x_2,y_2)
(x_k,y_k)
2D heatmap estimation
GT heatmaps
Source image
BN
ReLU
...
BN
2D Sigmoid
Source heatmap pred
Regression loss

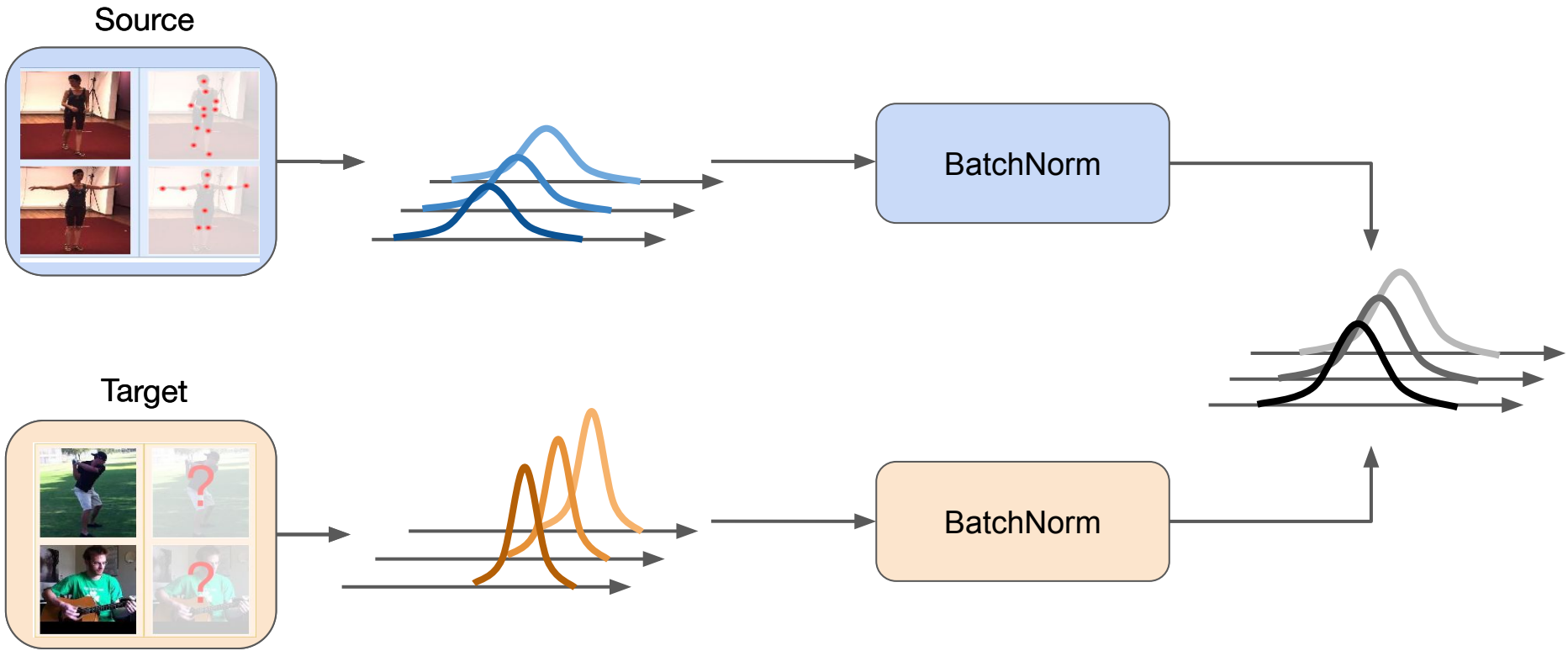
Our Method: Feature Alignment



Feature alignment

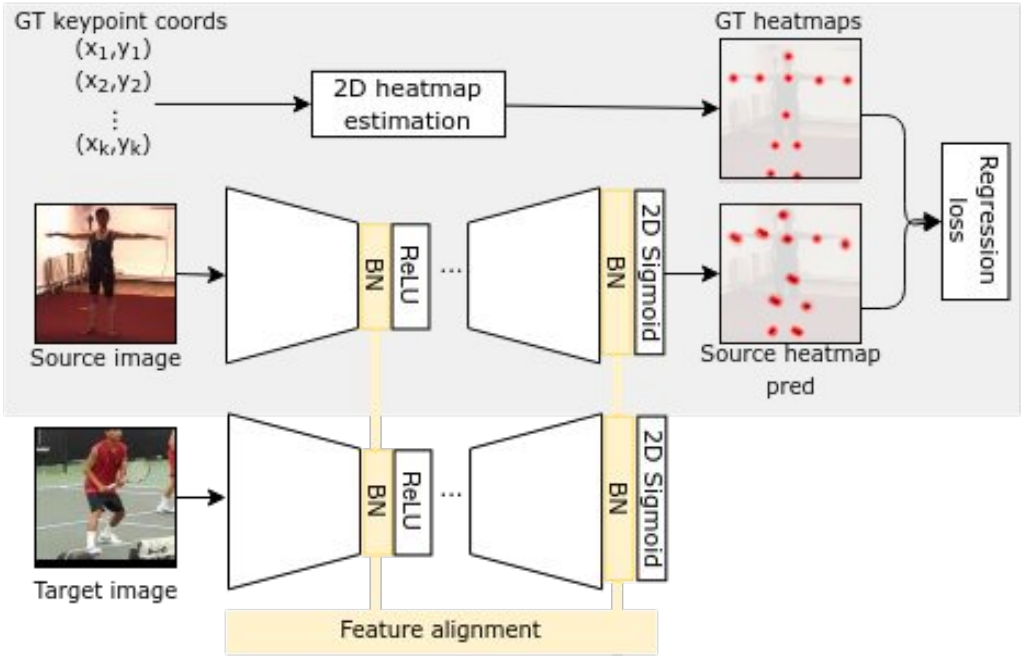


Feature alignment: AUTODIAL

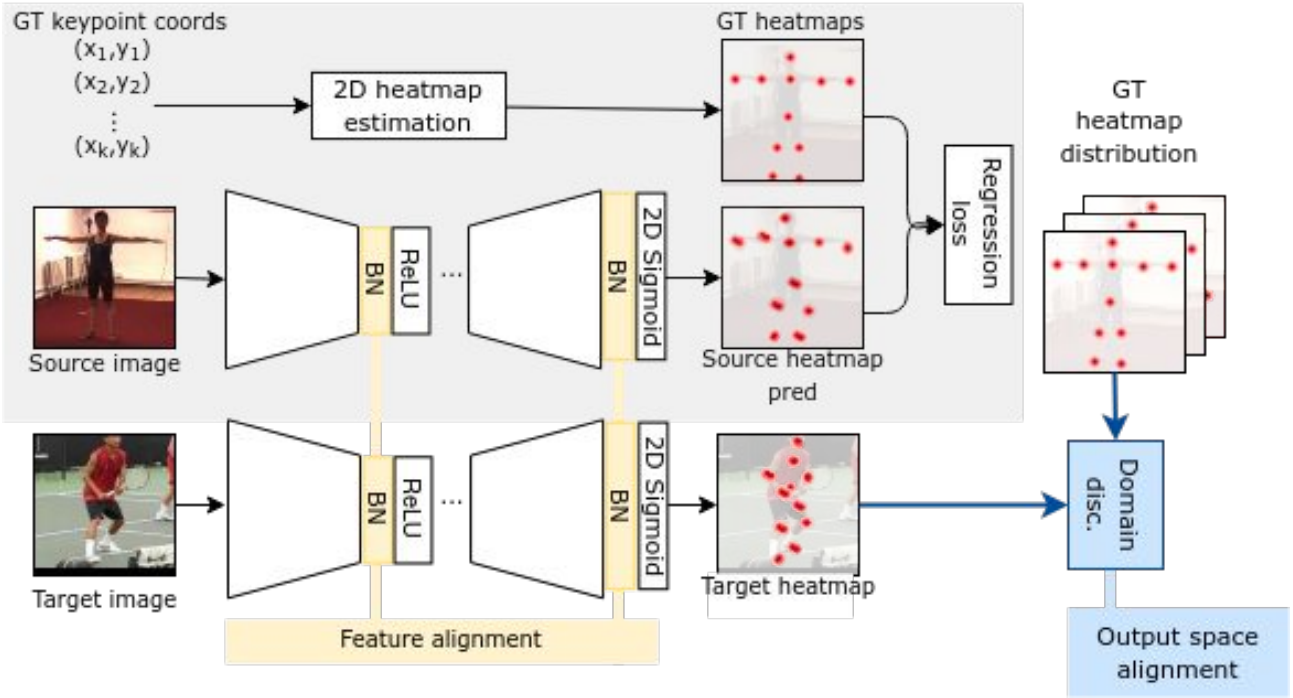


Carlucci et al., Autodial: Automatic Domain Alignment Layers. In Proc. ICCV, 2017.

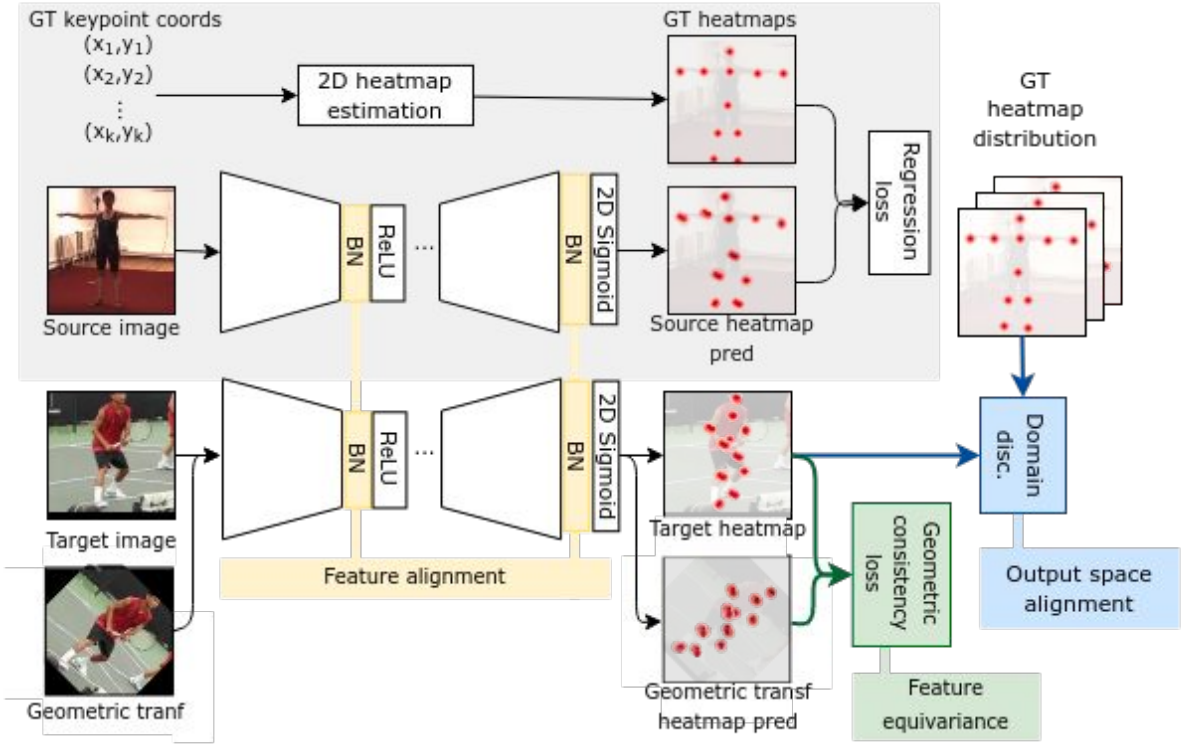
Our Method: Adaptation



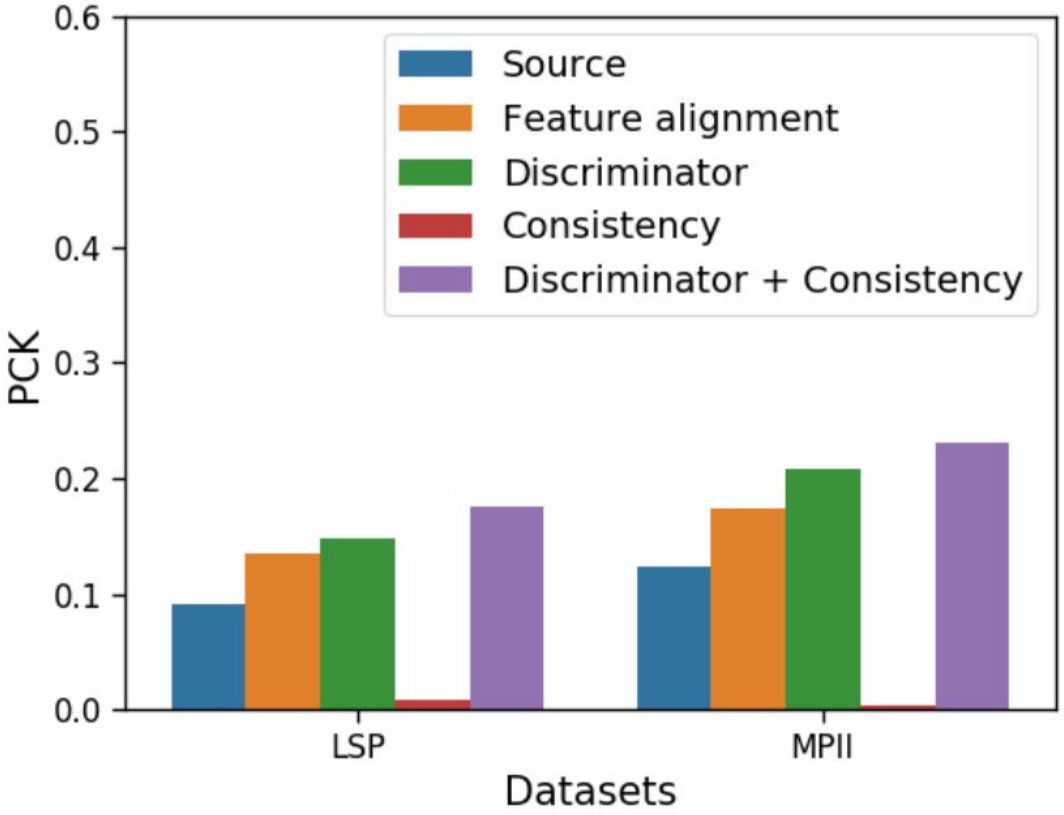
Our Method: Adaptation



Our Method: Adaptation



Ablation study



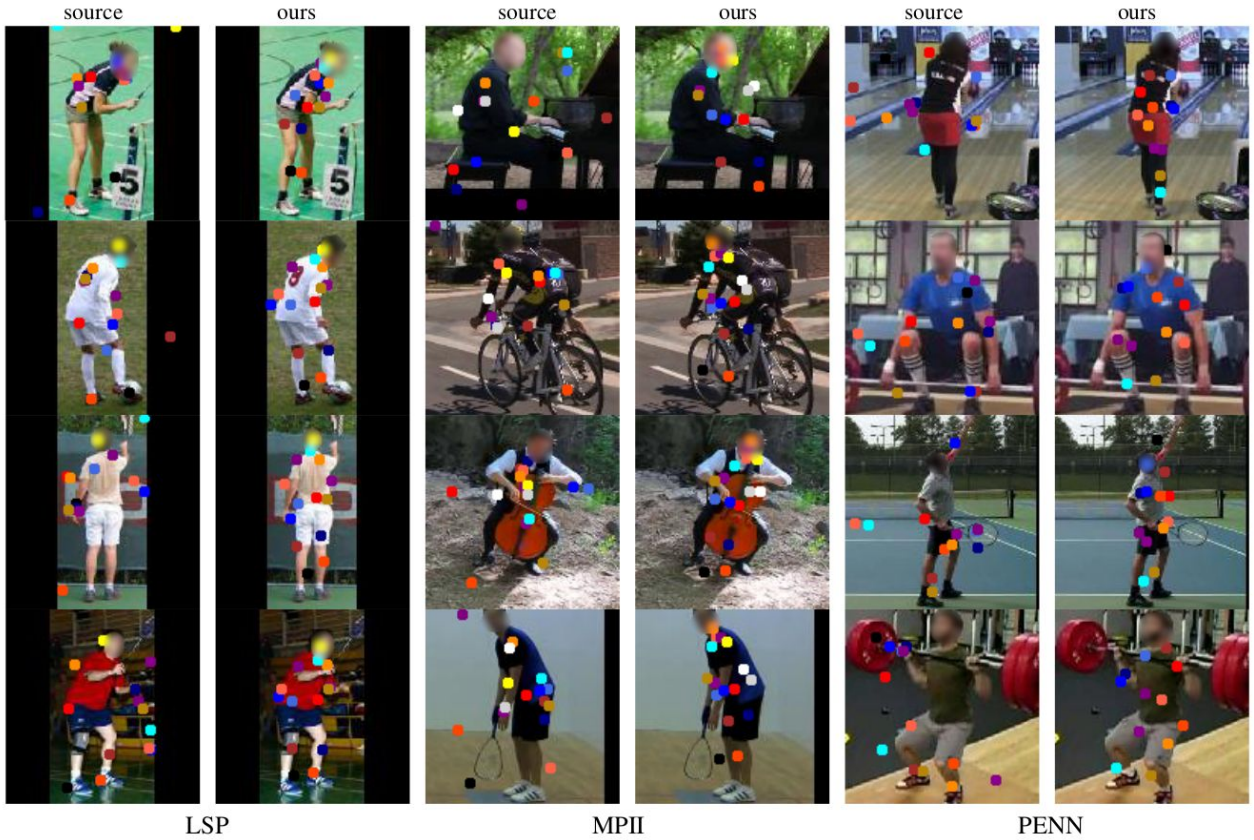
Quantitative results: Ablation study

TABLE II

COMPARISON WITH STATE OF THE ART METHODS ON THREE DATASETS

	LSP		MPII		PENN	
	PCK	**MSE**	**PCK**	**MSE**	**PCK**	**MSE**
Source Only	0.0906	0.3185	0.1229	0.2501	0.2332	0.3882
AutoDIAL [10]	0.1456	0.3240	0.1845	0.2140	0.2731	0.3262
ADDA [13]	0.1497	0.1627	0.2132	0.1734	0.2943	**0.2247**
Ours	**0.1764**	**0.1539**	**0.2337**	**0.1547**	**0.3032**	0.2264

Qualitative results



Thank you!

FACEBOOK

POLITECNICO
DI TORINO

UNIVERSITÀ DEGLI STUDI
DI TRENTO

ISTITUTO
ITALIANO DI
TECNOLOGIA