

OSSO: Obtaining Skeletal Shape from Outside

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Goal

Infer the **anatomic skeleton** from the **external body shape**

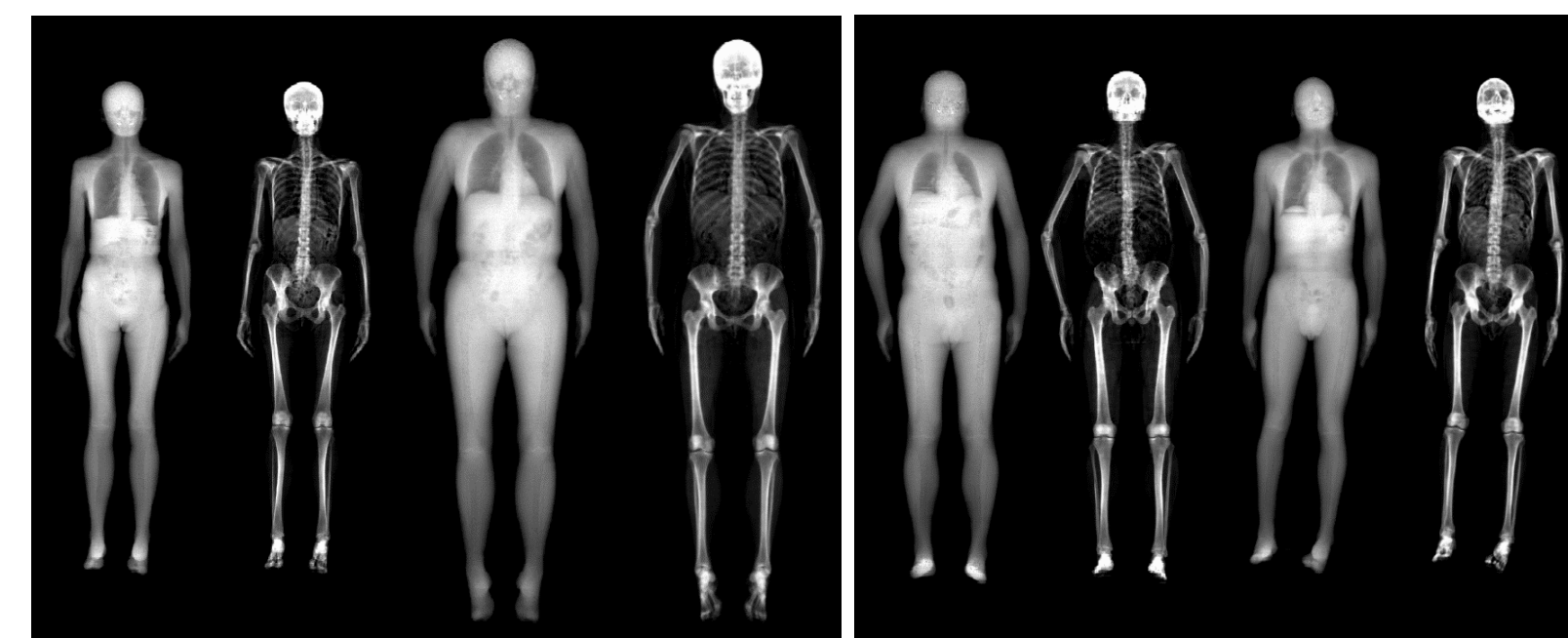
What we need

- Learn from real data
- Compare results to the ground truth (GT)

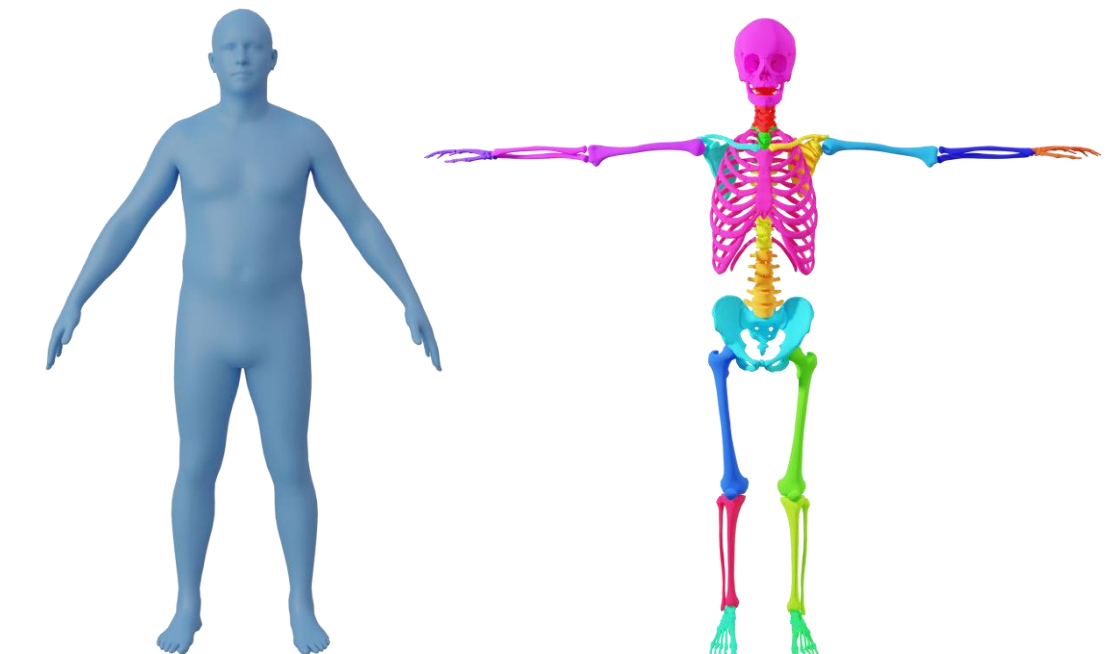


Problem

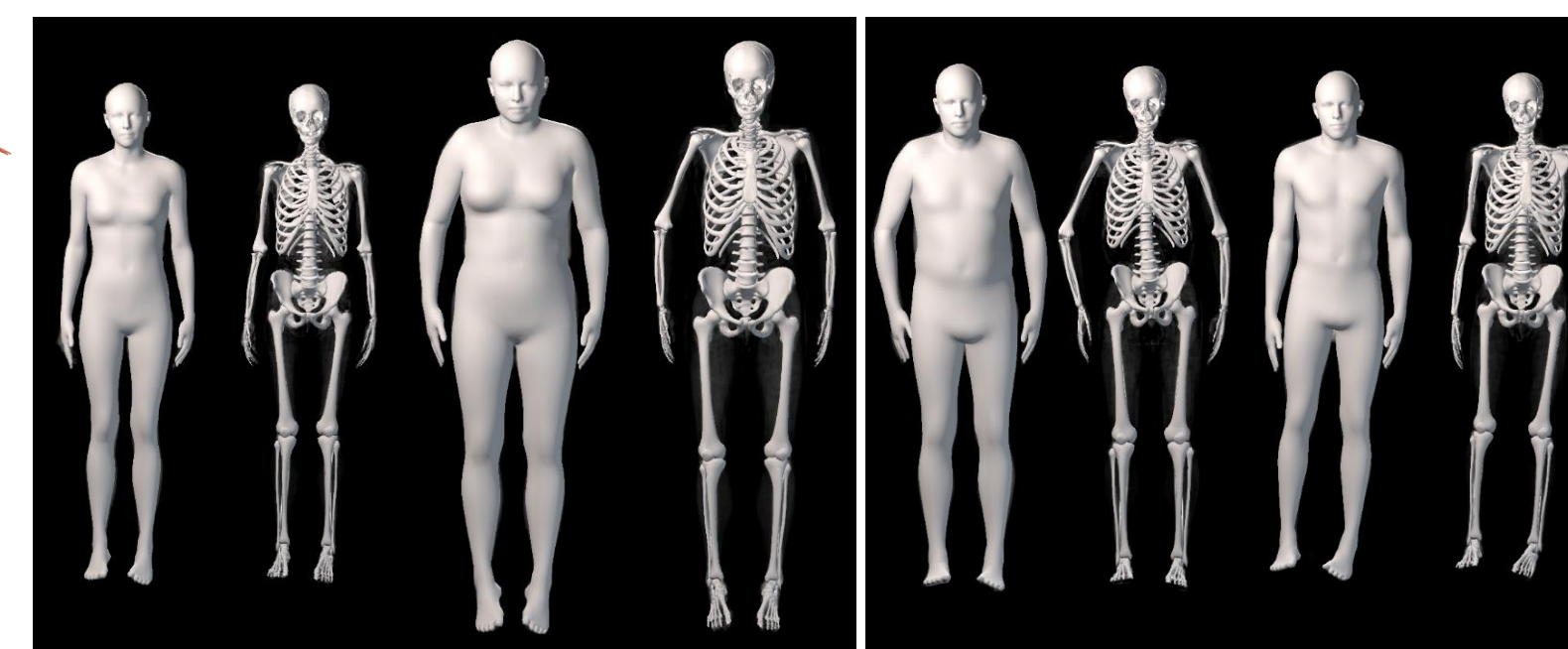
- No dataset of paired body and GT skeleton



DXA scan pairs

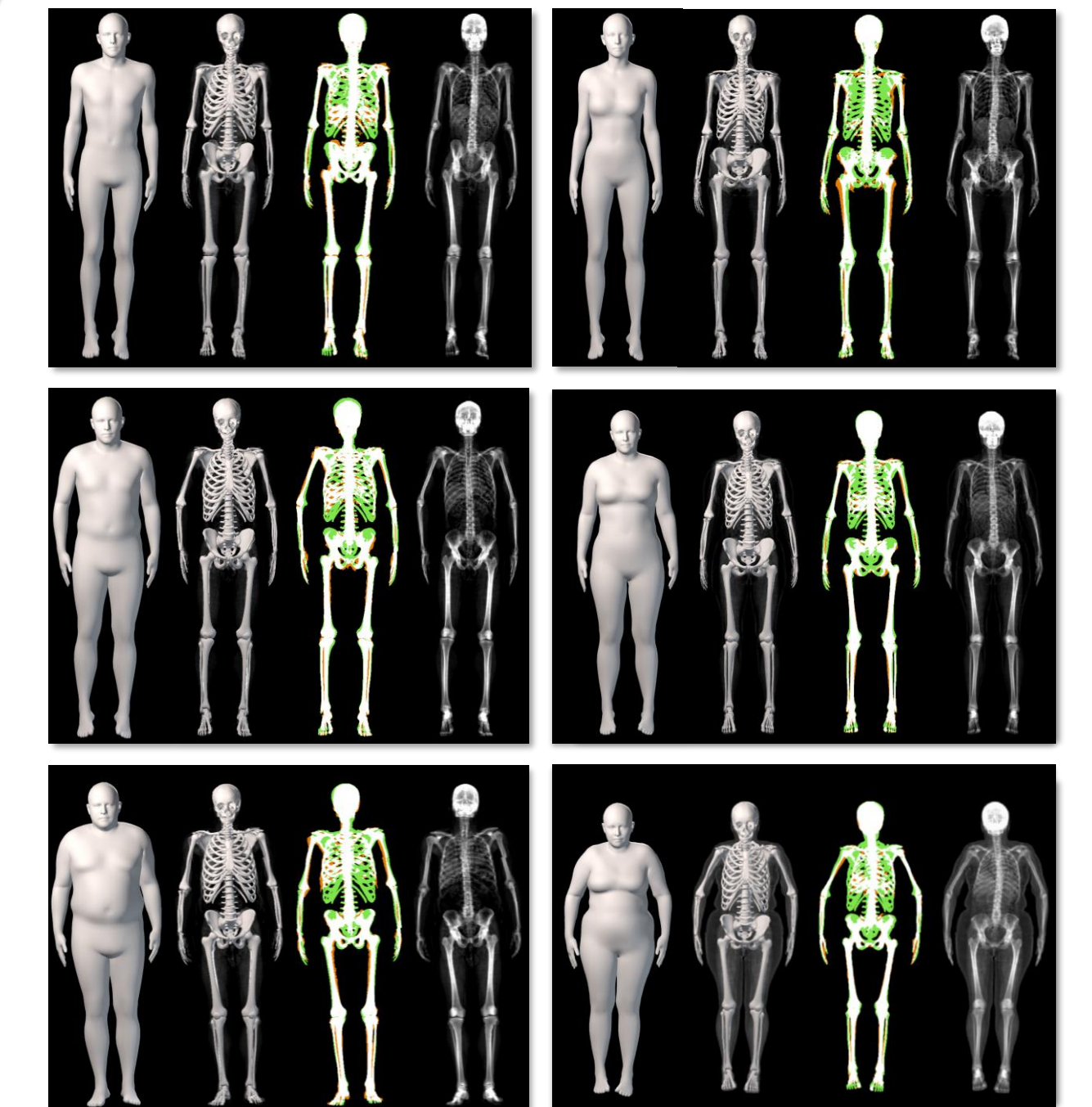


STAR [1] Stitched Puppet [2]



Aligned meshes

Evaluation

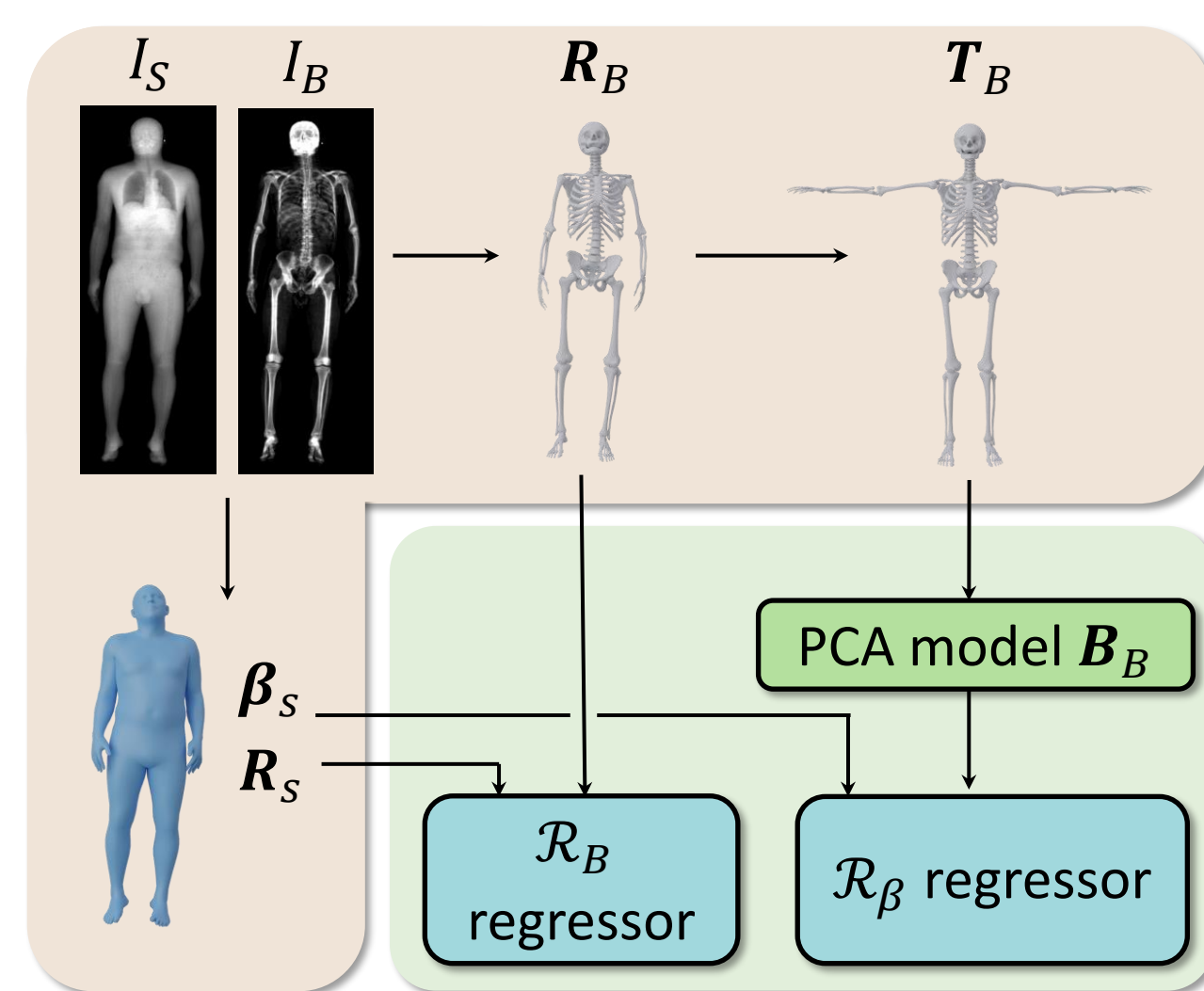


R_S OSSO \cap GT \cap GT R_S OSSO \cap GT \cap GT

	Male	Female	Male	Female
Method	$\cap_R(\%) \uparrow$		HD (px) \downarrow	
OSSO	88	89	10.6 \pm 3.2	9.1 \pm 2.3
AT [3]	84	88	14.4 \pm 2.9	11.5 \pm 3.1

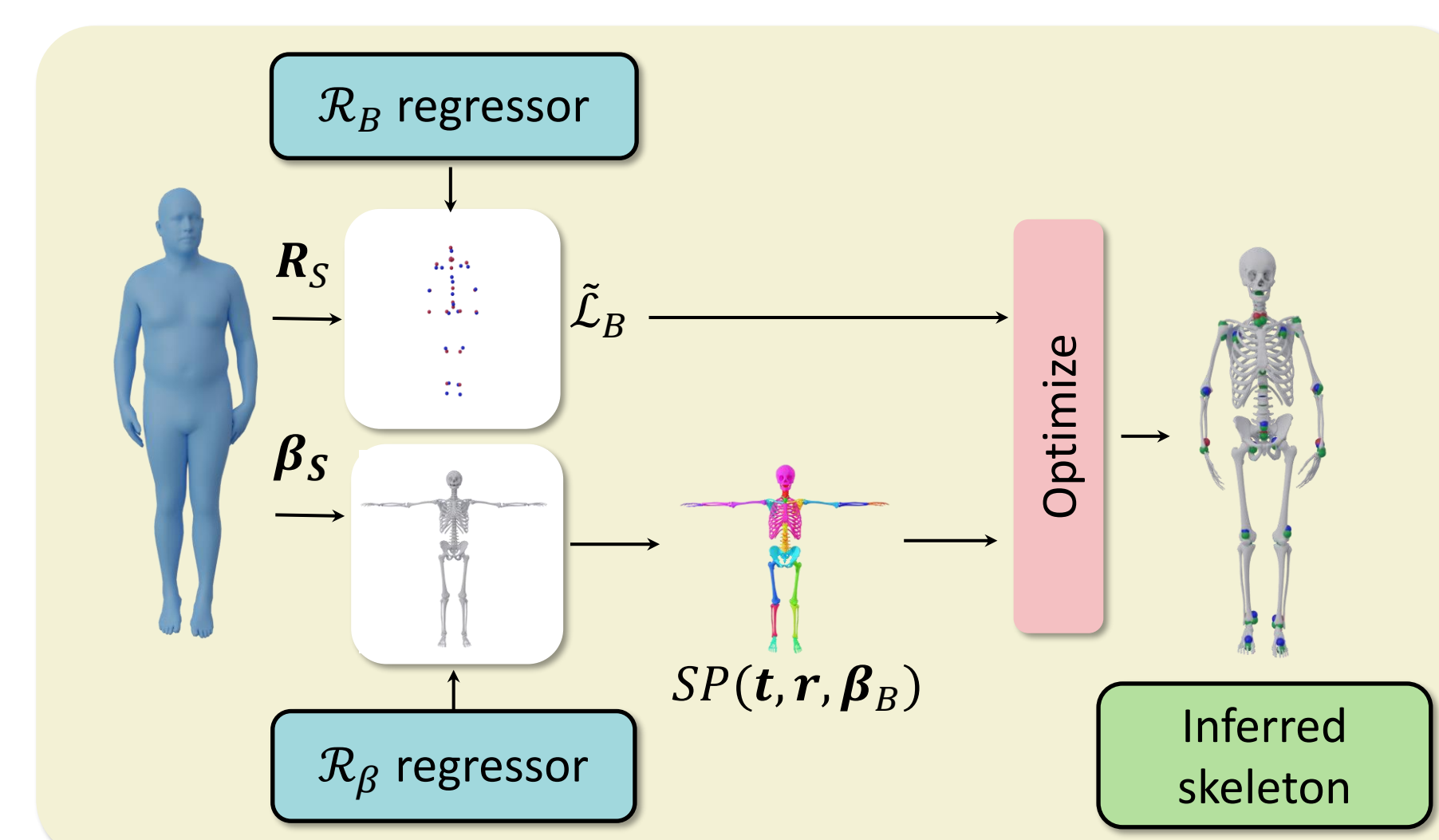
Learning

From the paired skeleton and body mesh, learn:

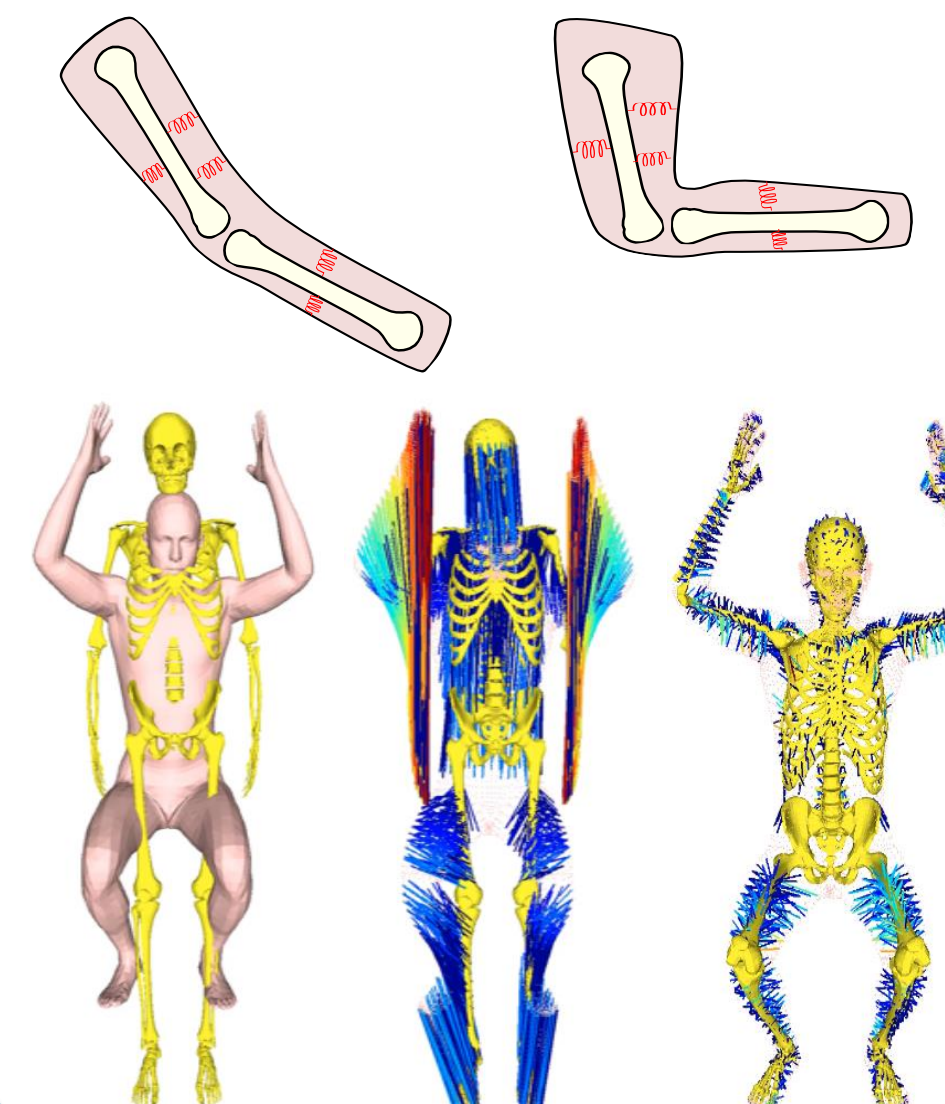


Inference

Given an unseen STAR body shape in lying down:

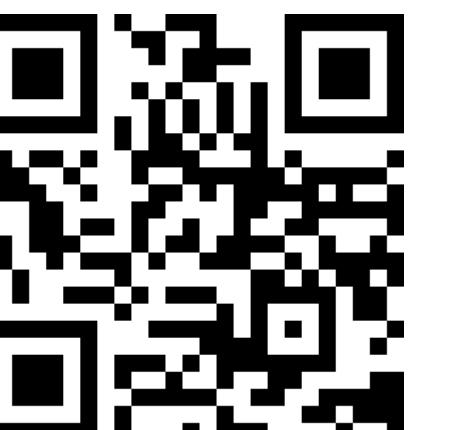


Reposing



Project page and code

osso.is.tue.mpg.de



References

- A. A. Osman, T. Bolkart, and M. J. Black. STAR: Sparse trained articulated human body regressor. In *European Conf. on Computer Vision (ECCV)*, Aug. 2020.
- S. Zuffi and M. J. Black. The stitched puppet: A graphical model of 3D human shape and pose. In *IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)*, June 2015.
- D. Ali-Hamadi, T. Liu, B. Gilles, L. Kavan, F. Faure, Olivier Palombi, and Marie-Paule Cani. *Anatomy transfer*. *ACM Transactions on Graphics*, Nov. 2013.