



EUROPEAN CONFERENCE ON COMPUTER VISION

M I L A N O
2 0 2 4

EgoPoser: Robust Real-Time Egocentric Pose Estimation from Sparse and Intermittent Observations Everywhere

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Background

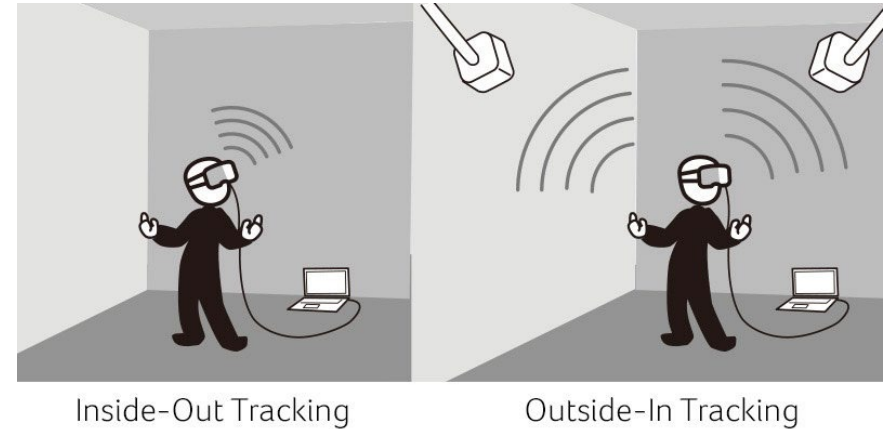


Source: <https://www.uploadvr.com/quest-3-body-tracking/>



Limitations of existing methods

1. Assume a limited indoor motion space. However, portable inside-out tracking allows unrestricted movement.
2. Assume the tracking signals are always available. However, hands can move out of the field of view.
3. Assume an average body shape for all users. However, human body diversity is critical in VR/AR.

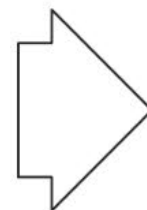
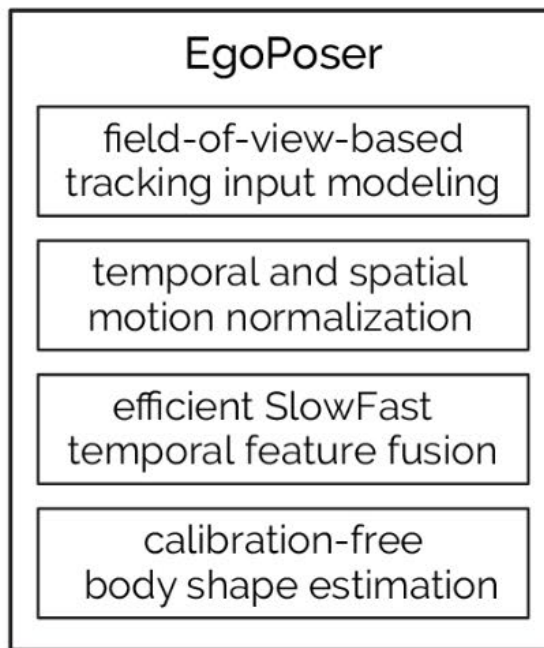




EgoPoser

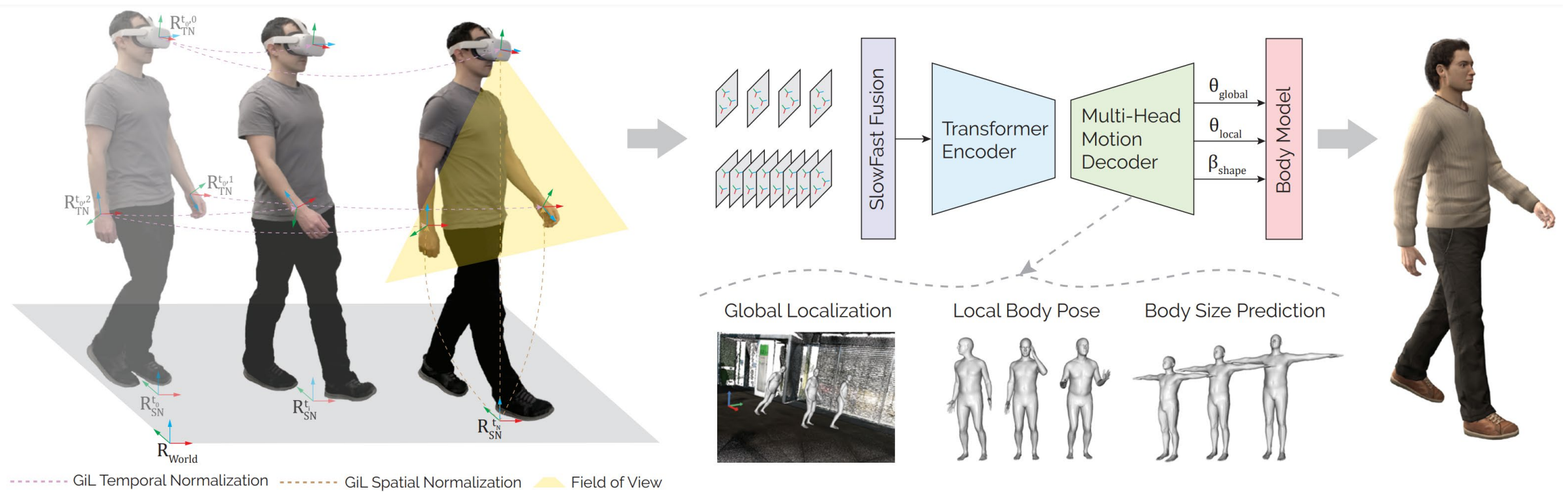


sparse and
intermittent
inside-out
tracking



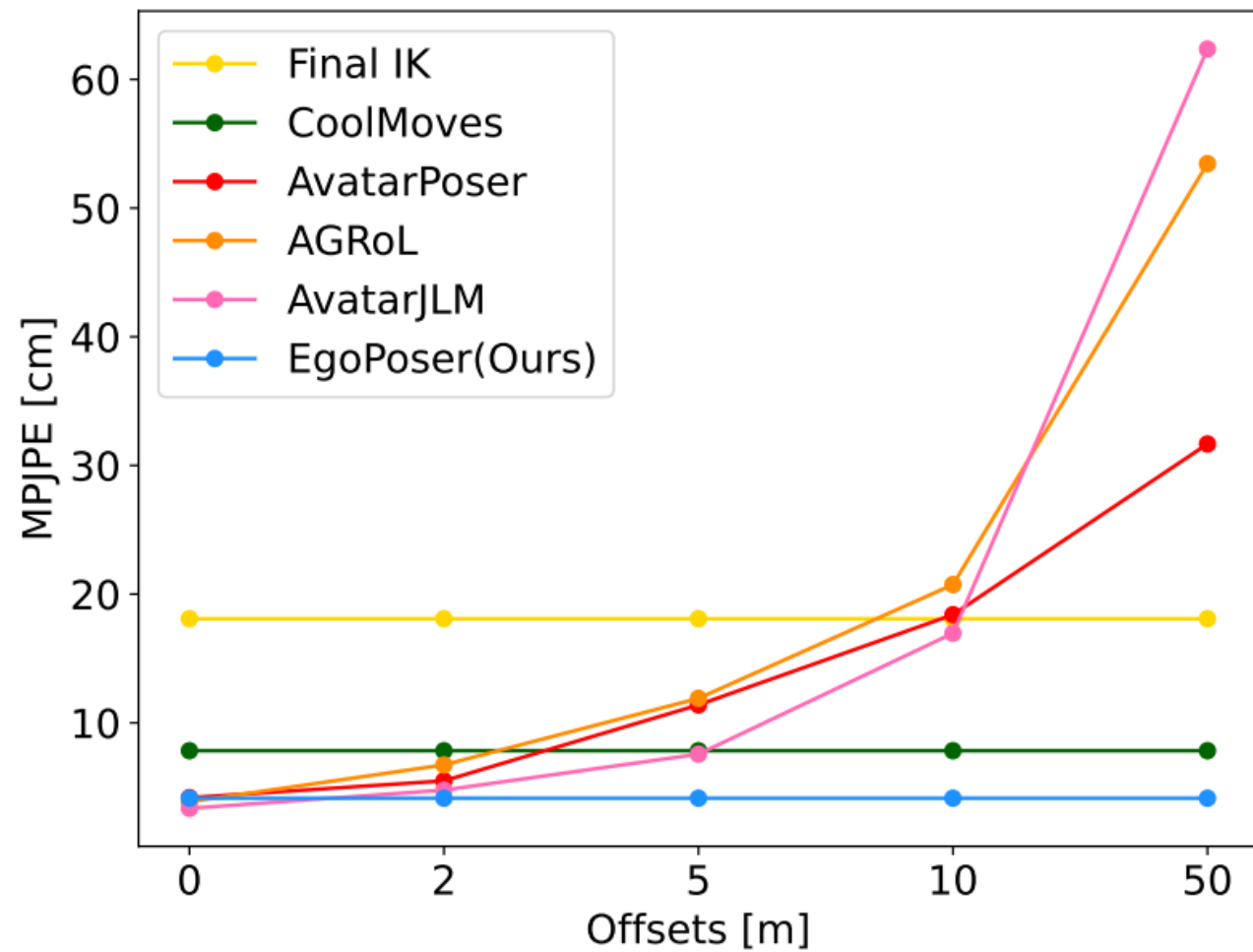


Method





Robustness to the offset to the origin

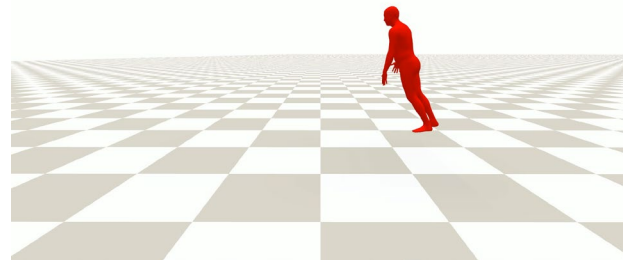
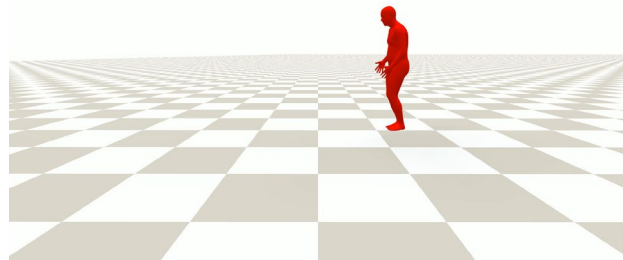
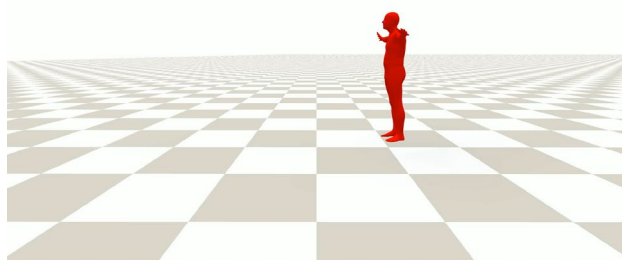




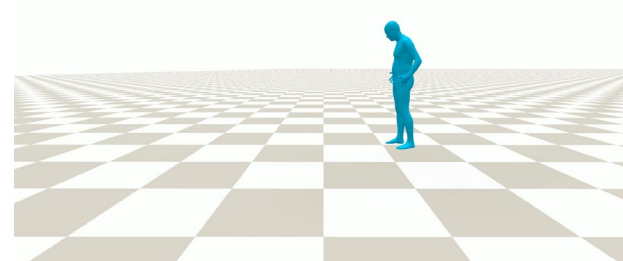
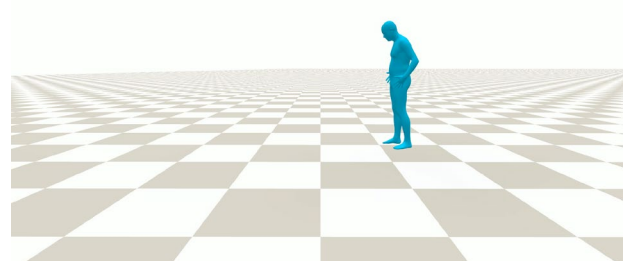
Robustness to the offset to the origin



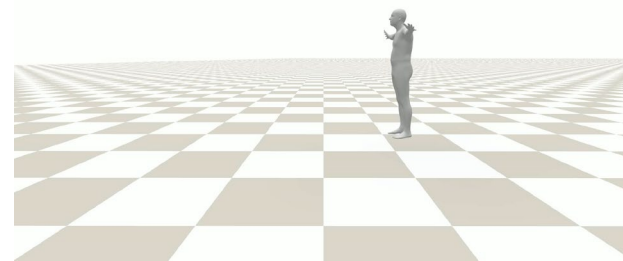
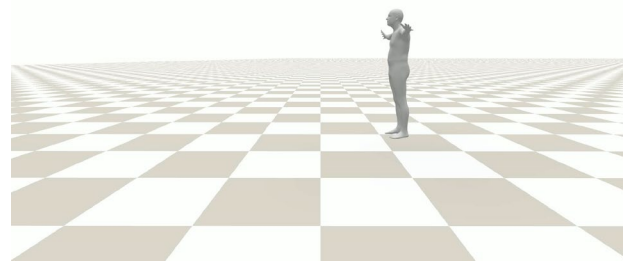
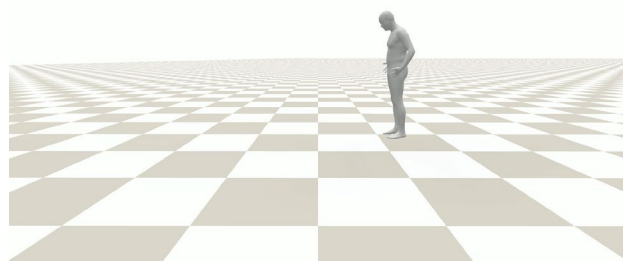
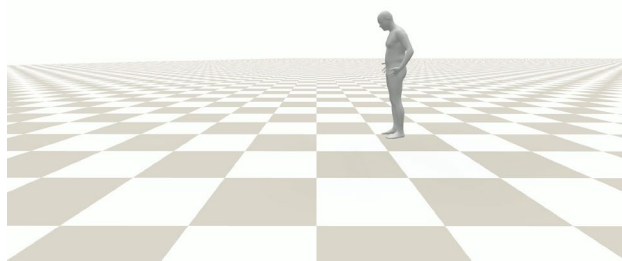
AvatarPoser



EgoPoser (Ours)



Ground Truth



Offset=0m

Offset=2m

Offset=10m

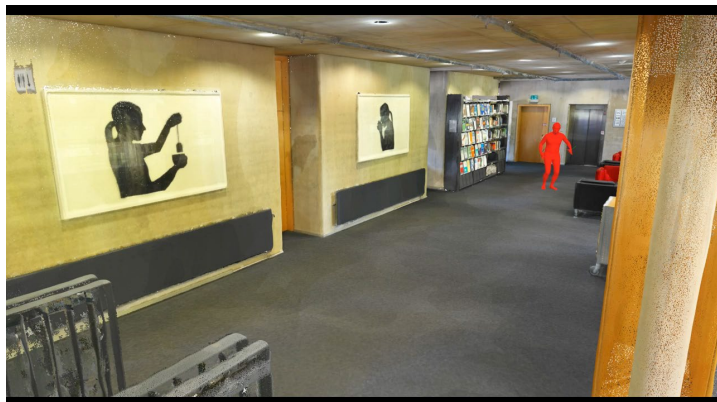
Offset=50m

Results on HPS dataset

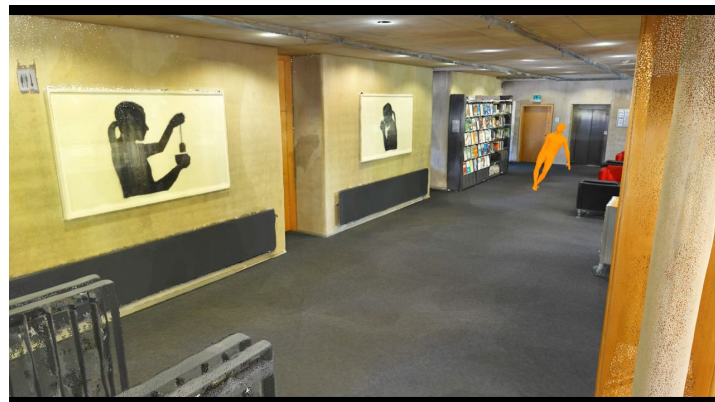
Methods	BIB_EG_Tour		MPI_EG		Working_Standing		UG_Computers		Go_Around	
	MPJPE	MPJVE	MPJPE	MPJVE	MPJPE	MPJVE	MPJPE	MPJVE	MPJPE	MPJVE
AvatarPoser [21]	22.53	60.25	16.54	36.39	19.08	52.95	23.24	40.65	19.50	59.54
AvatarPoser-Improved	11.48	82.70	13.86	59.66	12.42	77.83	11.42	50.46	12.56	82.42
AGRoL [11]	28.95	166.34	19.41	55.52	17.67	53.97	20.90	109.12	14.16	98.34
AGRoL-Improved	15.04	124.12	13.94	89.42	13.86	89.42	12.71	106.43	13.13	128.42
AvatarJLM [51]	41.27	82.92	12.91	50.44	17.26	69.08	21.31	55.42	11.57	62.18
AvatarJLM-Improved	14.80	79.66	14.72	45.57	13.75	68.98	10.28	45.74	11.19	68.87
EgoPoser (Ours)	9.55	49.39	11.05	35.60	8.70	46.49	10.25	38.29	6.90	45.10



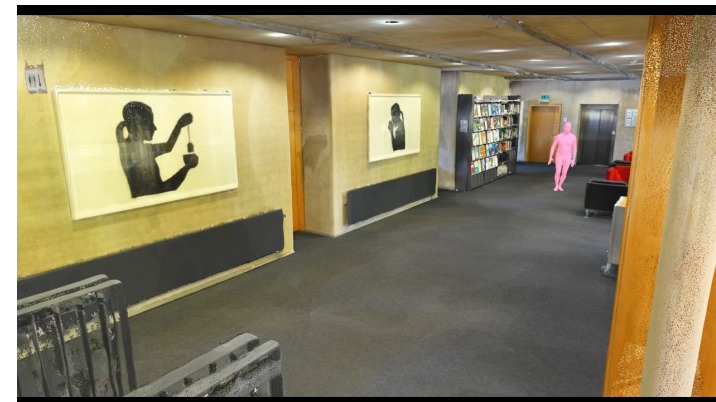
Comparisons to SOTAs on HPS dataset



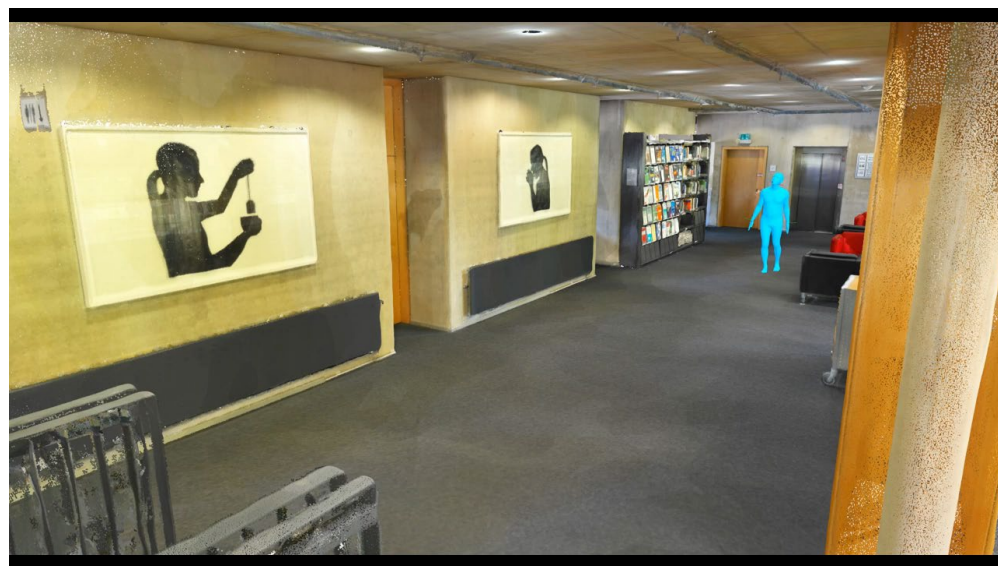
AvatarPoser (ECCV'22)



AGRoL (CVPR'23)



AvatarJLM (ICCV'23)



EgoPoser (Ours)

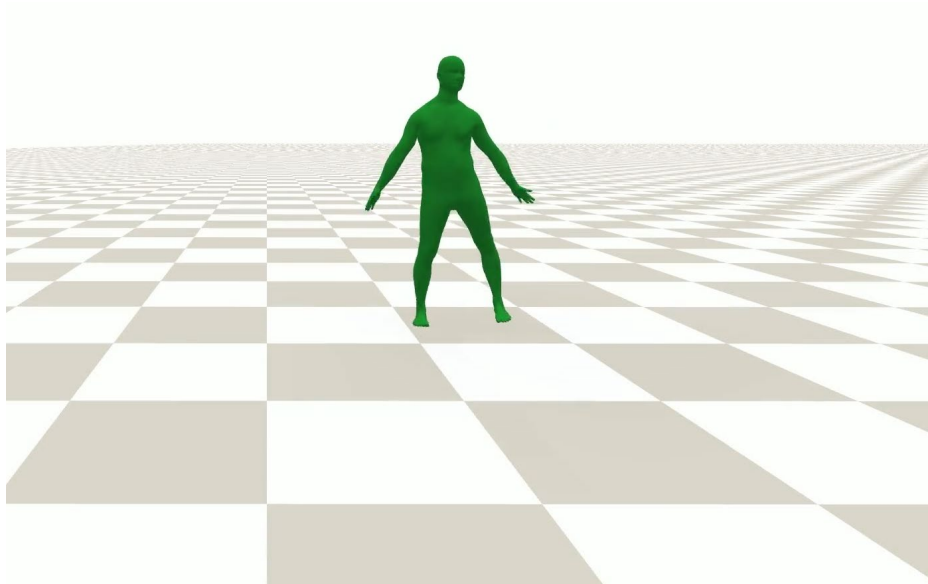


Ground Truth

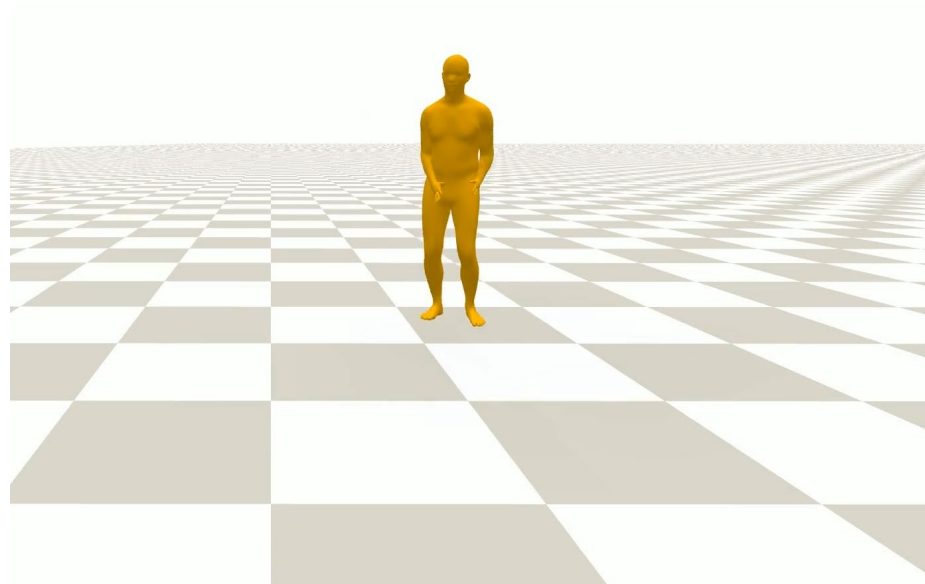




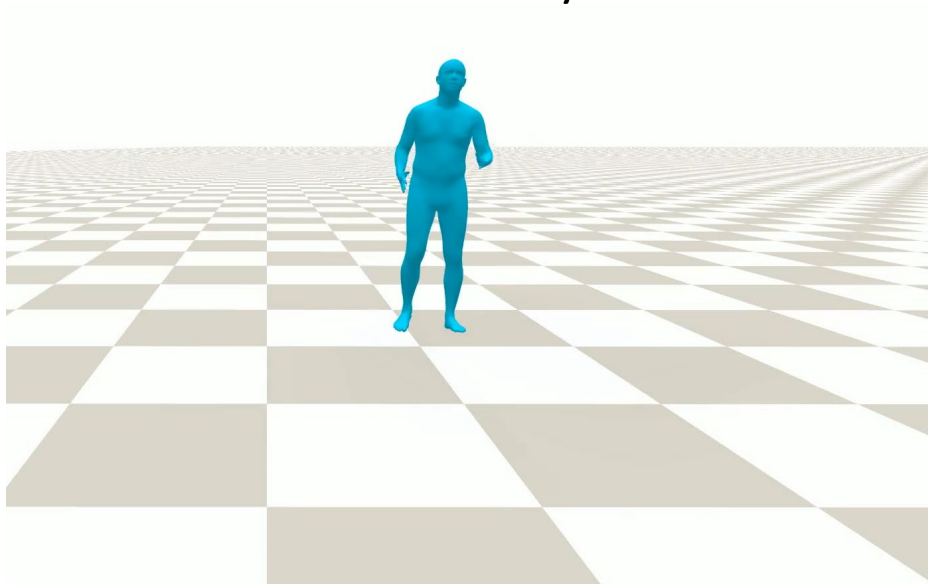
Realistic FoV modelling



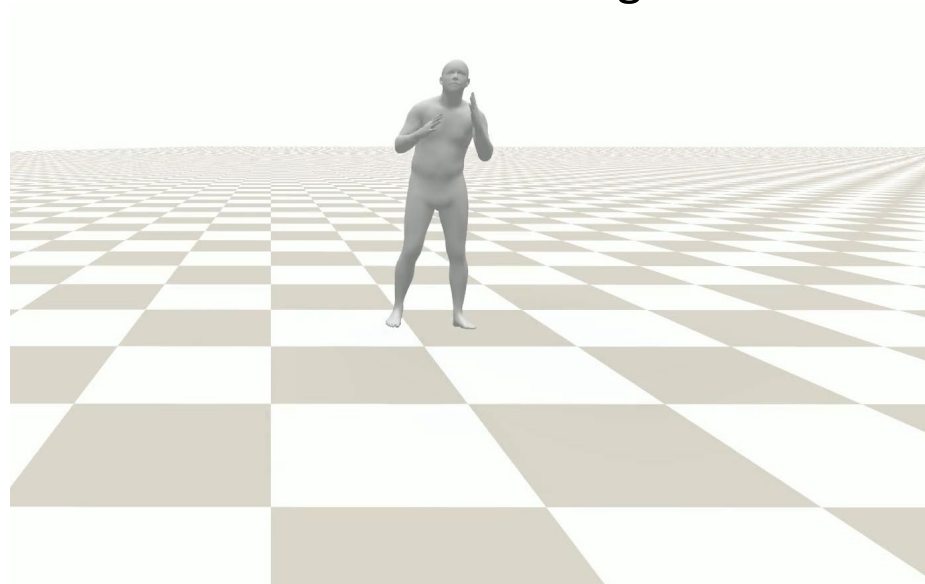
Full Visibility



Random Masking



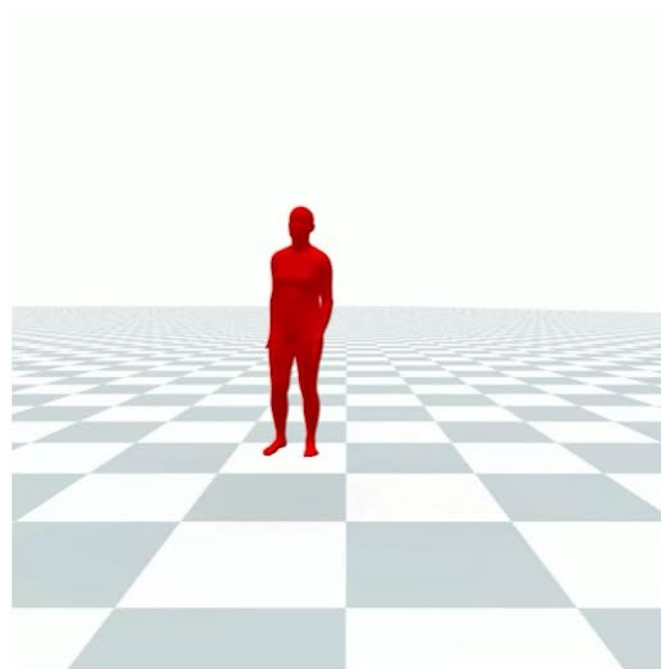
Ours



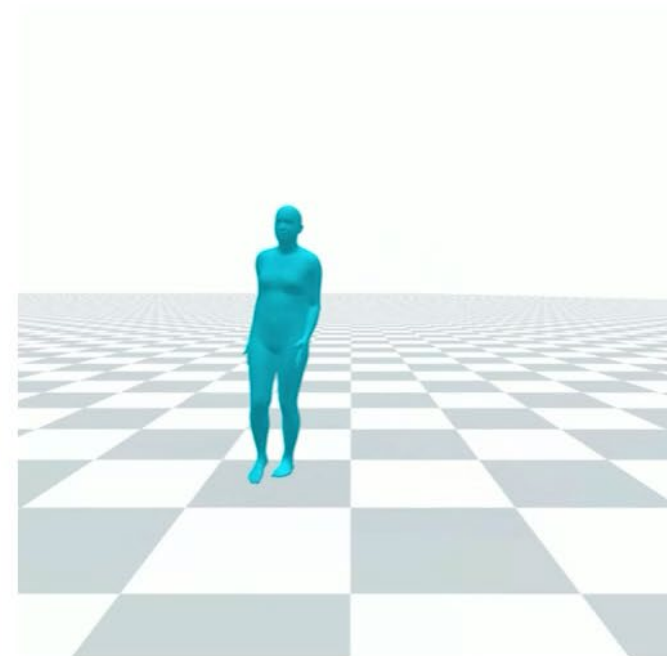
Ground Truth



Test on a real VR headset (Meta Quest 2)



AvatarPoser



EgoPoser (Ours)

