

ROBUST-PIFU: ROBUST PIXEL-ALIGNED IMPLICIT FUNCTION FOR 3D HUMAN DIGITALIZATION FROM A SINGLE IMAGE

Authors: Kennard Yanting Chan (Presenting), Fayao Liu,
Guosheng Lin, Chuan Sheng Foo, Weisi Lin

Background and Motivation

- Field: 3D Human Digitalization
 - Existing methods: SeSDF, ECON, ICON, PIFuHD etc.

Background and Motivation

- Field: 3D Human Digitalization
 - Existing methods: SeSDF, ECON, ICON, PIFuHD etc.
- Research Gap: Unable to deal with occlusions

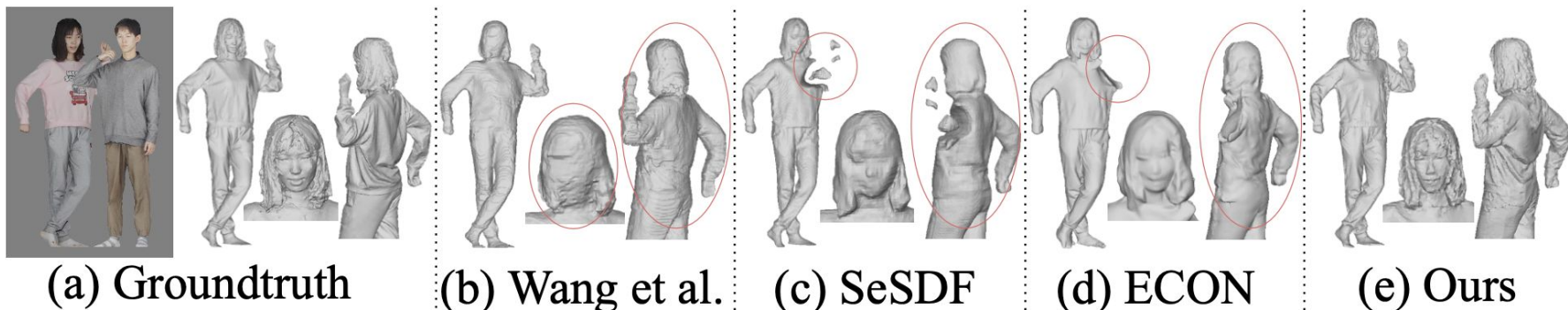


Figure 1: Results of SOTA and RobustPIFu on input images (in color) that have external occlusions.

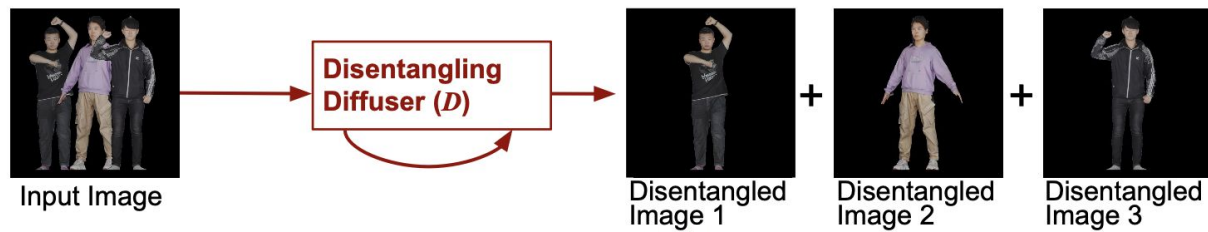
Background and Motivation

- Field: 3D Human Digitalization
 - Existing methods: SeSDF, ECON, ICON, PIFuHD etc.
- Research Gap: Unable to deal with occlusions
- Thus, we propose **Robust-PIFu**.

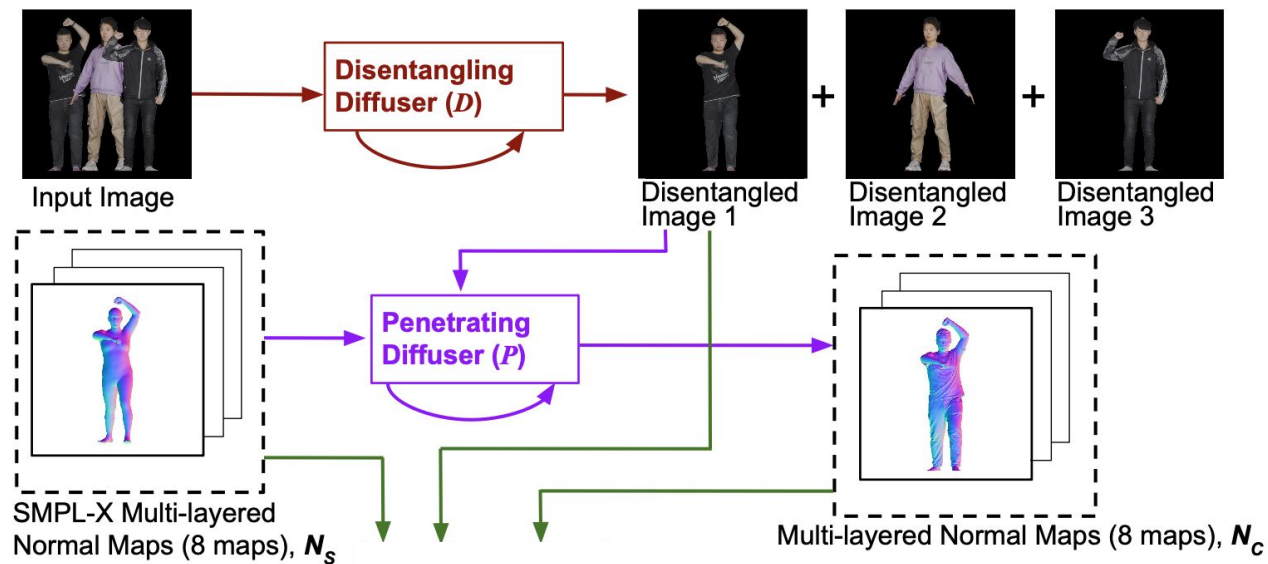
Background and Motivation

- Field: 3D Human Digitalization
 - Existing methods: SeSDF, ECON, ICON, PIFuHD etc.
- Research Gap: Unable to deal with occlusions
- Thus, we propose **Robust-PIFu**.
- Definitions:
 - External Occlusions: Occlusions caused by external factors
 - Internal Occlusions: Occlusions caused by the human subject herself.

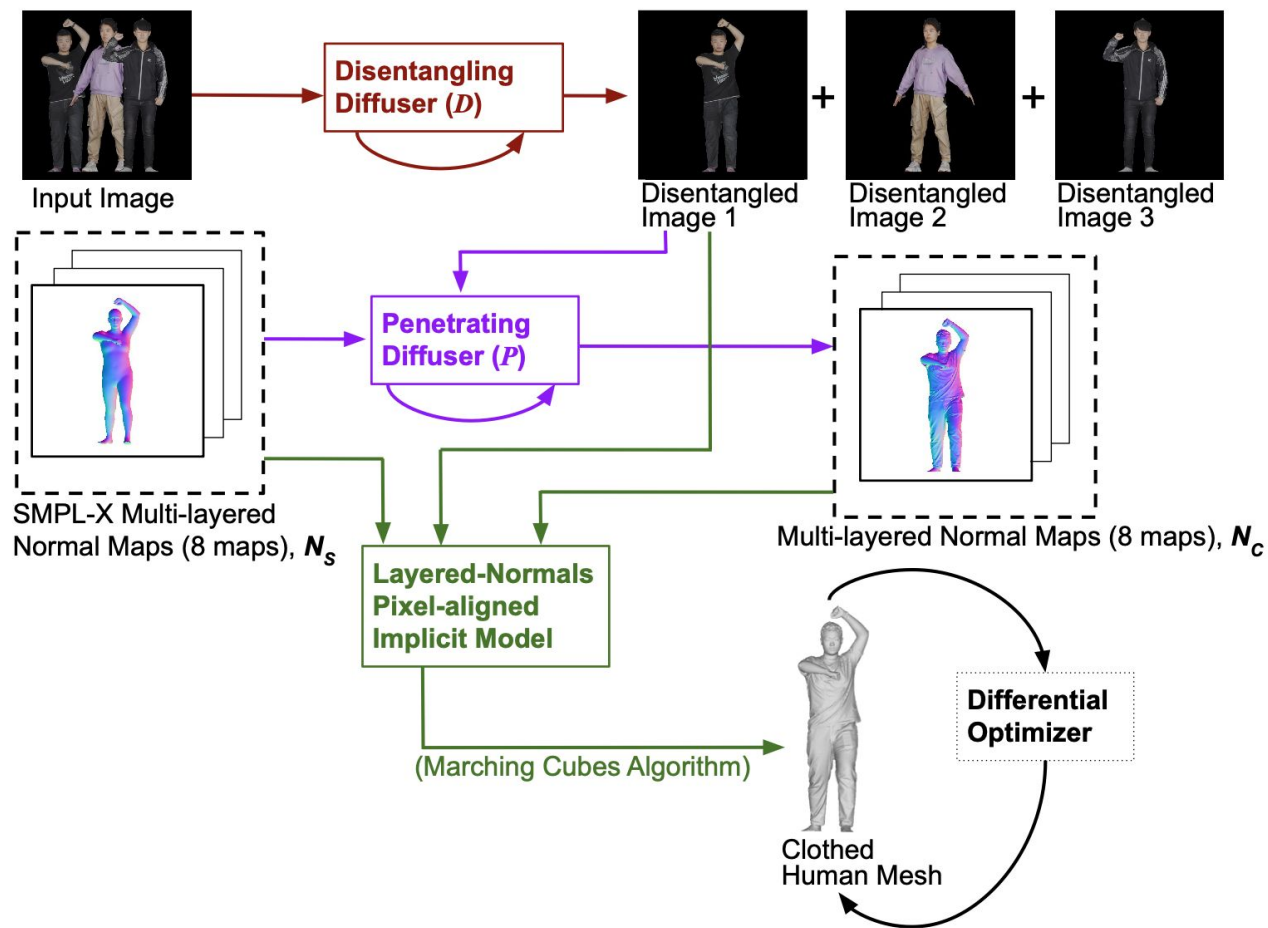
Method



Method



Method



Qualitative Results

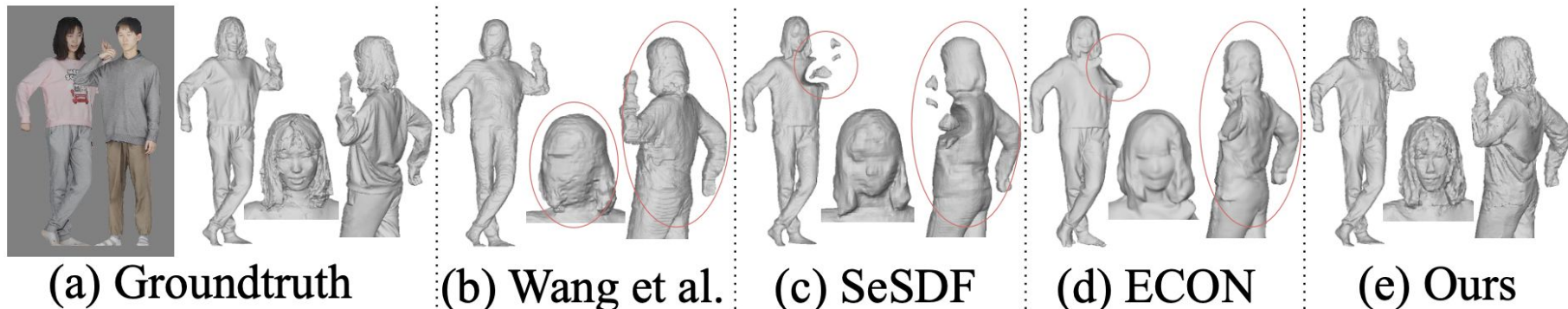


Figure 1: Results of SOTA and RobustPIFu on input images (in color) that have external occlusions.

Qualitative Results

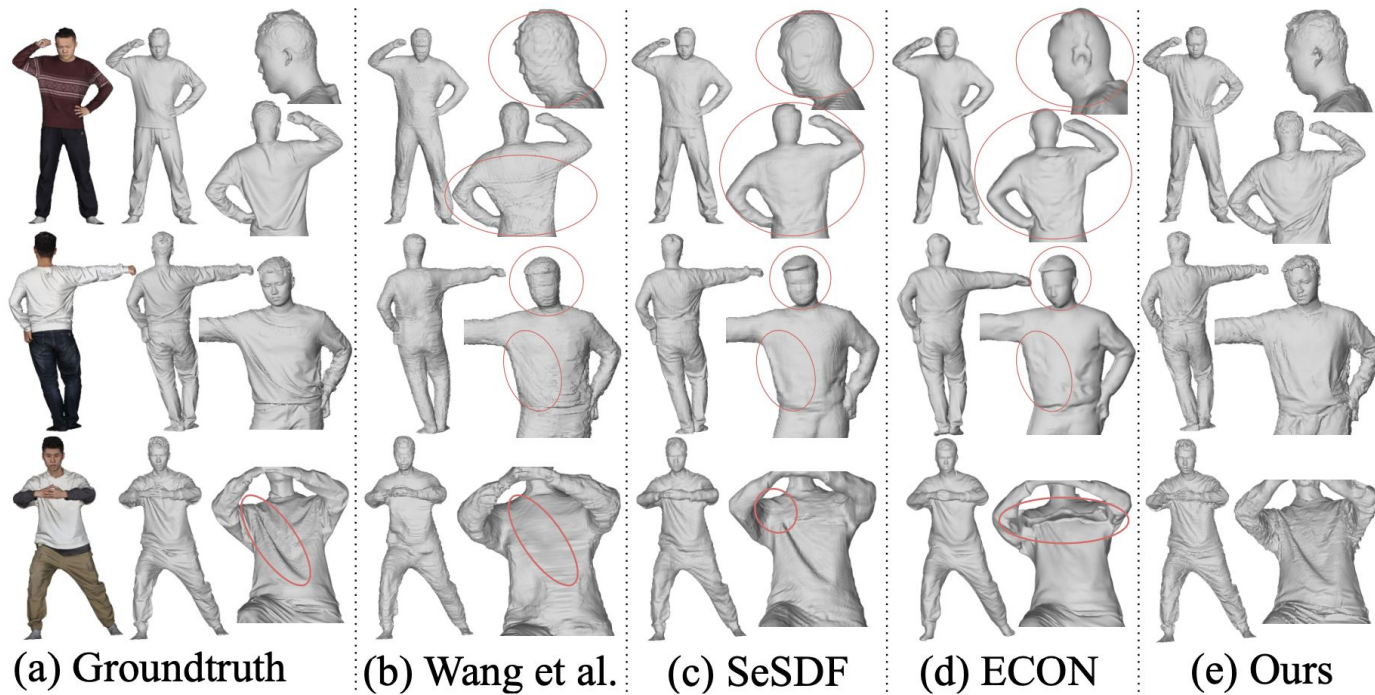


Figure 2: Results on input images (in color) that have no occlusion (1st row), internal occlusion due to non-frontal pose (2nd row), and internal occlusion due to self-occlusion (3rd row)

Qualitative Results

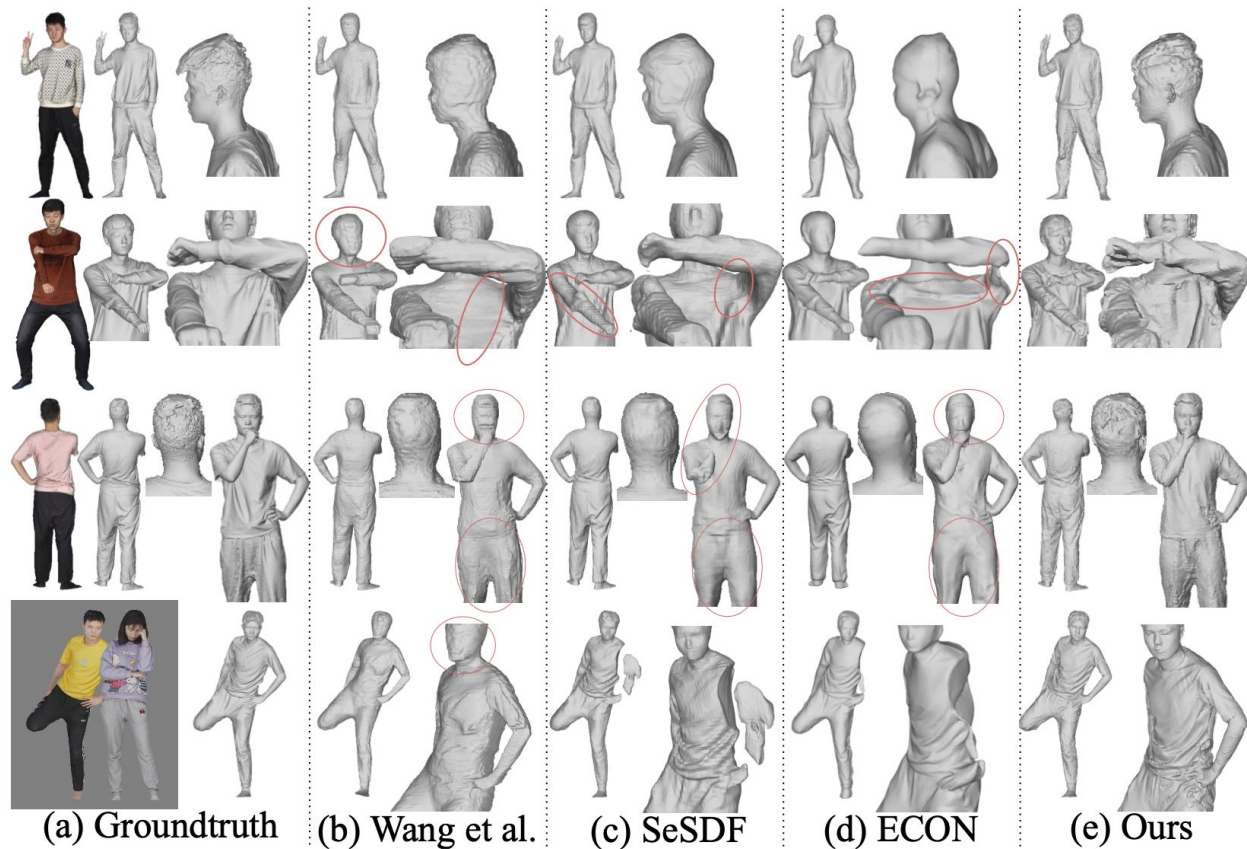


Figure 7: Results on input images (in color) that have no occlusion (1st row), internal occlusions due to self-occlusion (2nd row) and non-frontal pose (3rd row), and external occlusion (4th row)

Quantitative Results

Table 1: Quantitative Evaluation between SOTA and our Robust-PIFu.

Methods	THuman2.0		BUFF		MultiHuman	
	CD (10^{-5})	P2S (10^{-5})	CD (10^2)	P2S (10^2)	CD (10^{-5})	P2S (10^{-5})
ICON	9.947	9.014	8.659	7.892	15.76	13.39
ECON	11.17	9.090	9.064	9.750	14.69	13.13
D-IF	10.24	9.137	9.136	7.644	16.71	13.78
SeSDF	8.941	8.441	6.582	6.947	14.00	12.30
Wang et al.	8.944	8.596	9.072	9.881	21.01	21.64
Robust-PIFu (Ours)	8.426	8.000	6.127	6.525	13.38	11.66

Conclusion and Acknowledgement

- This research work is supported by the Agency for Science, Technology and Research (A*STAR).