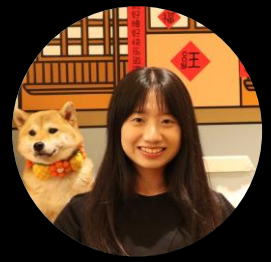
JUNE 18-22, 2023
CVPR
VANCOUVER, CANADA

UV Volumes
for Real-time Rendering of Editable Free-view Human Performance


Yue Chen

Xuan Wang

Xingyu Chen

Qi Zhang

Xiaoyu Li

Yu Guo

Jue Wang

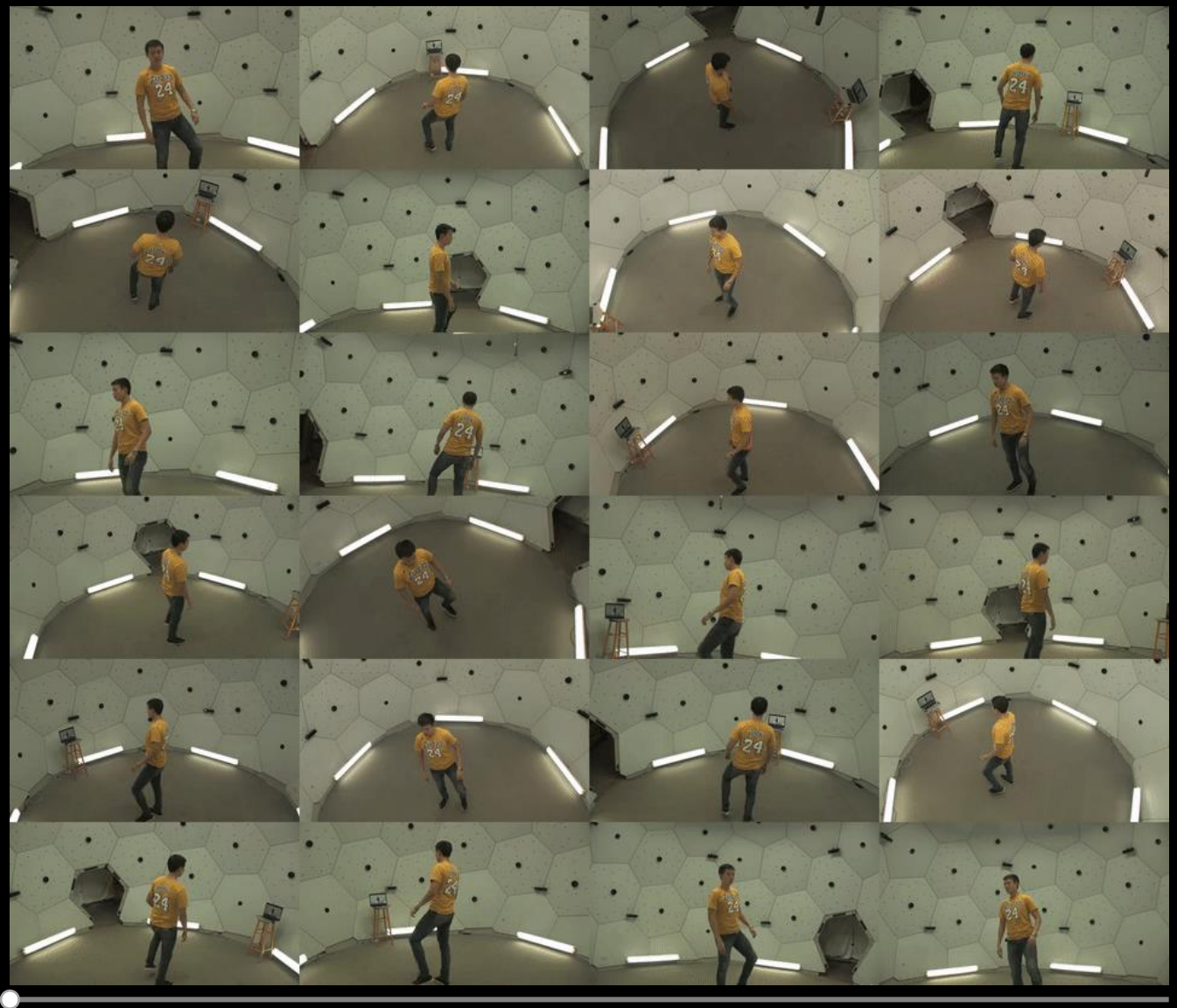
Fei Wang

西安交通大學 XI'AN JIAOTONG UNIVERSITY

IAIR Est. 1986

ANT GROUP

Tencent AI Lab



Input: multi-view videos

34FPS (for rendering only)

Novel view synthesis of dynamic human
(Our result)

Reposing

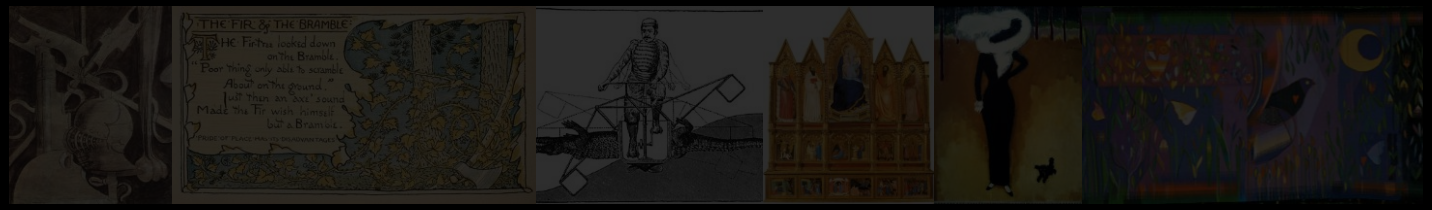
Side leg lifts

Reshaping

Shoulder-to-waist ratio

Texture Edit

Texture Transfer



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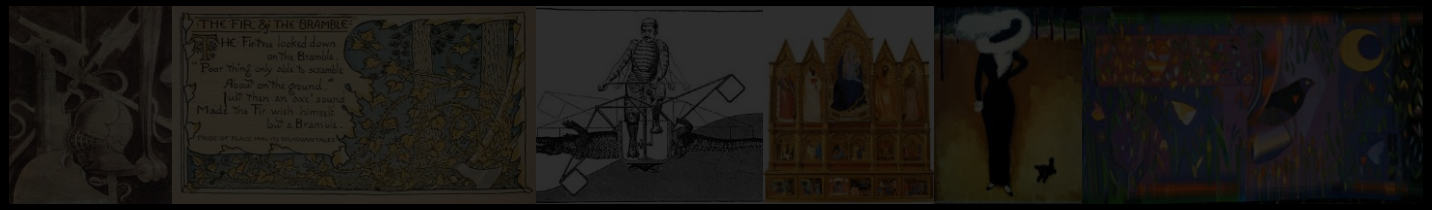

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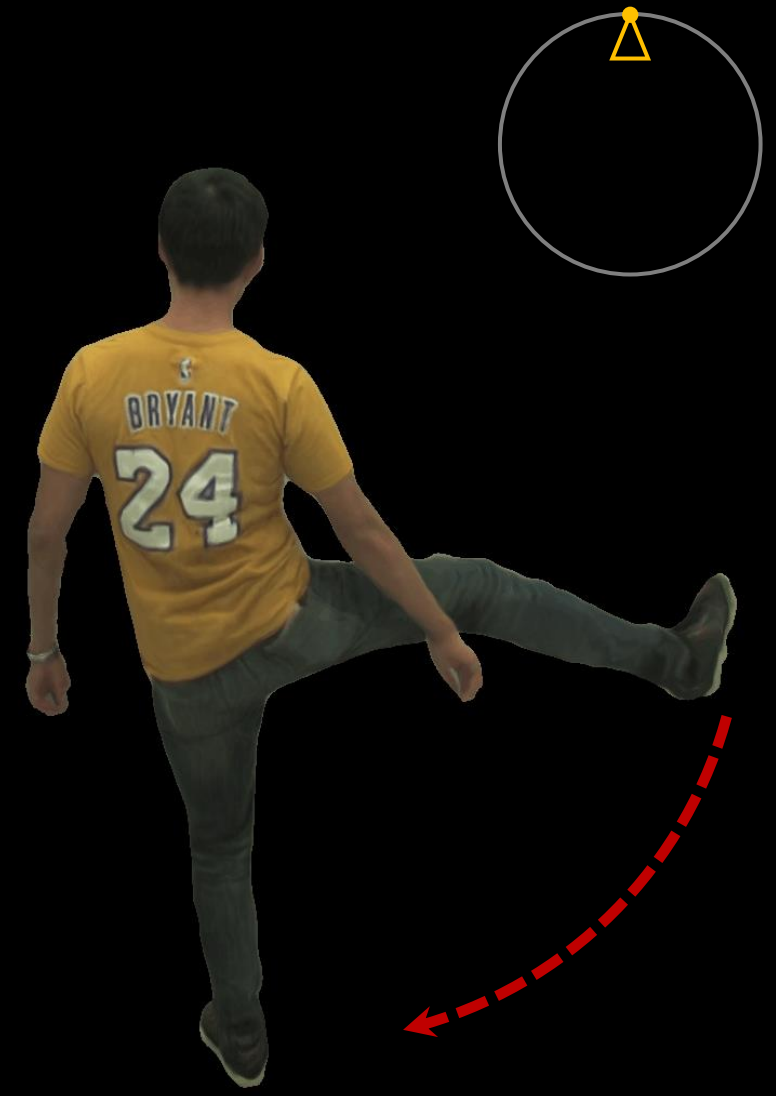

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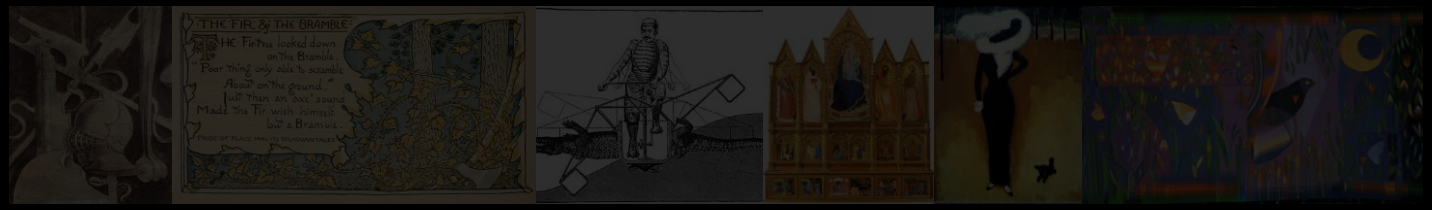

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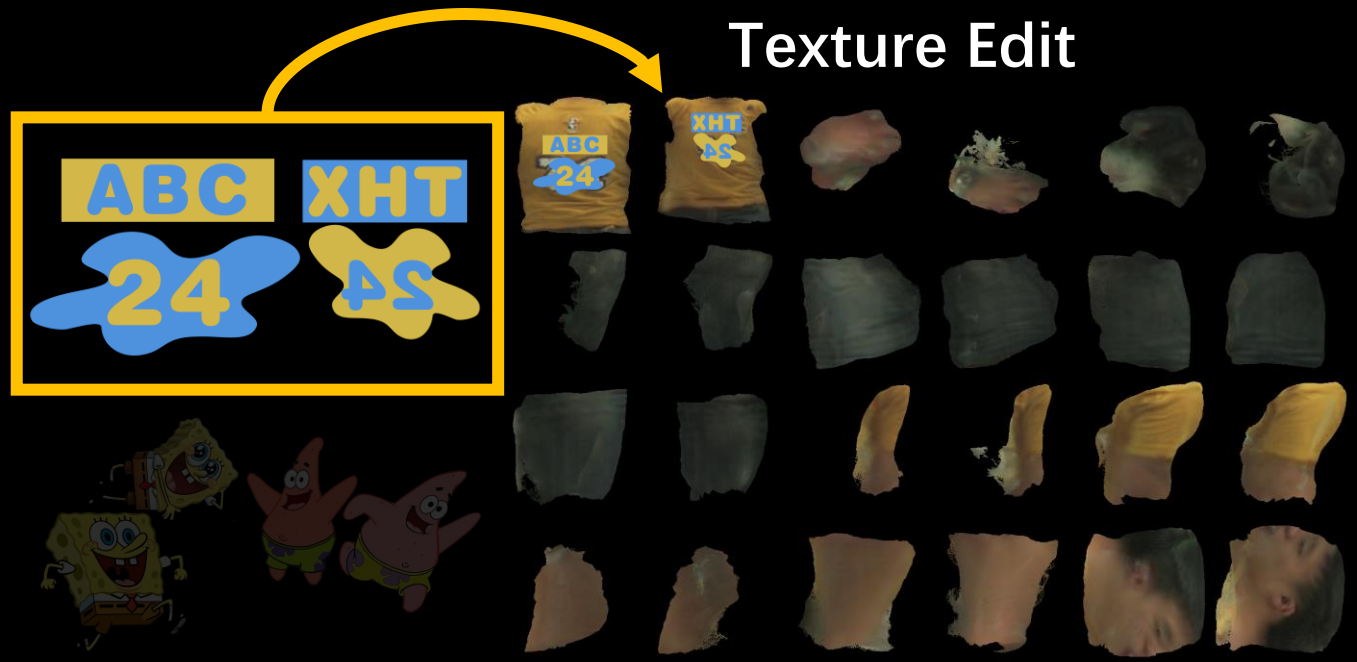

Texture Transfer

Novel view synthesis of dynamic human
(Our result)

Reposing

Side leg lifts

Reshaping

Shoulder-to-waist ratio

Texture Edit

Texture Transfer

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(Our result)

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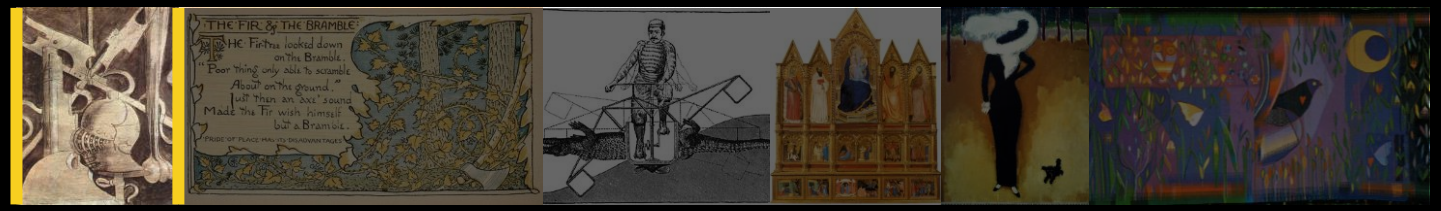
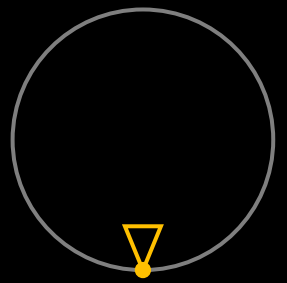


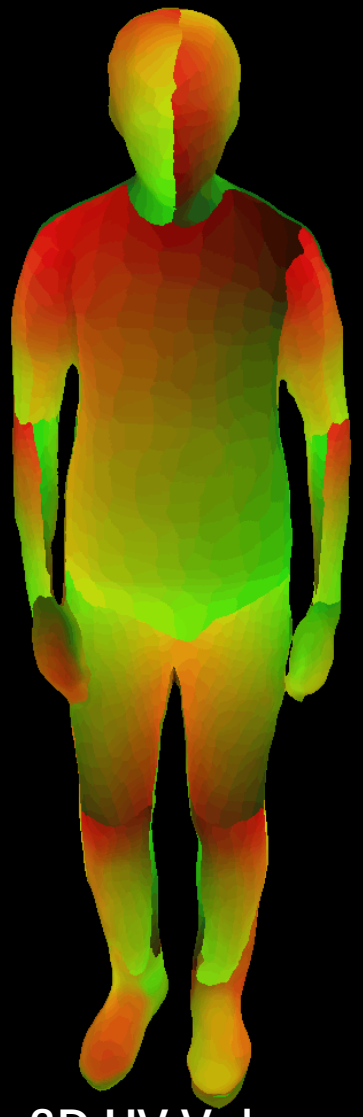
Novel view synthesis of dynamic human (Our result)

Motivation

37FPS (for rendering only)

Pose-driven & view-dependent
2D Neural Texture Stacks



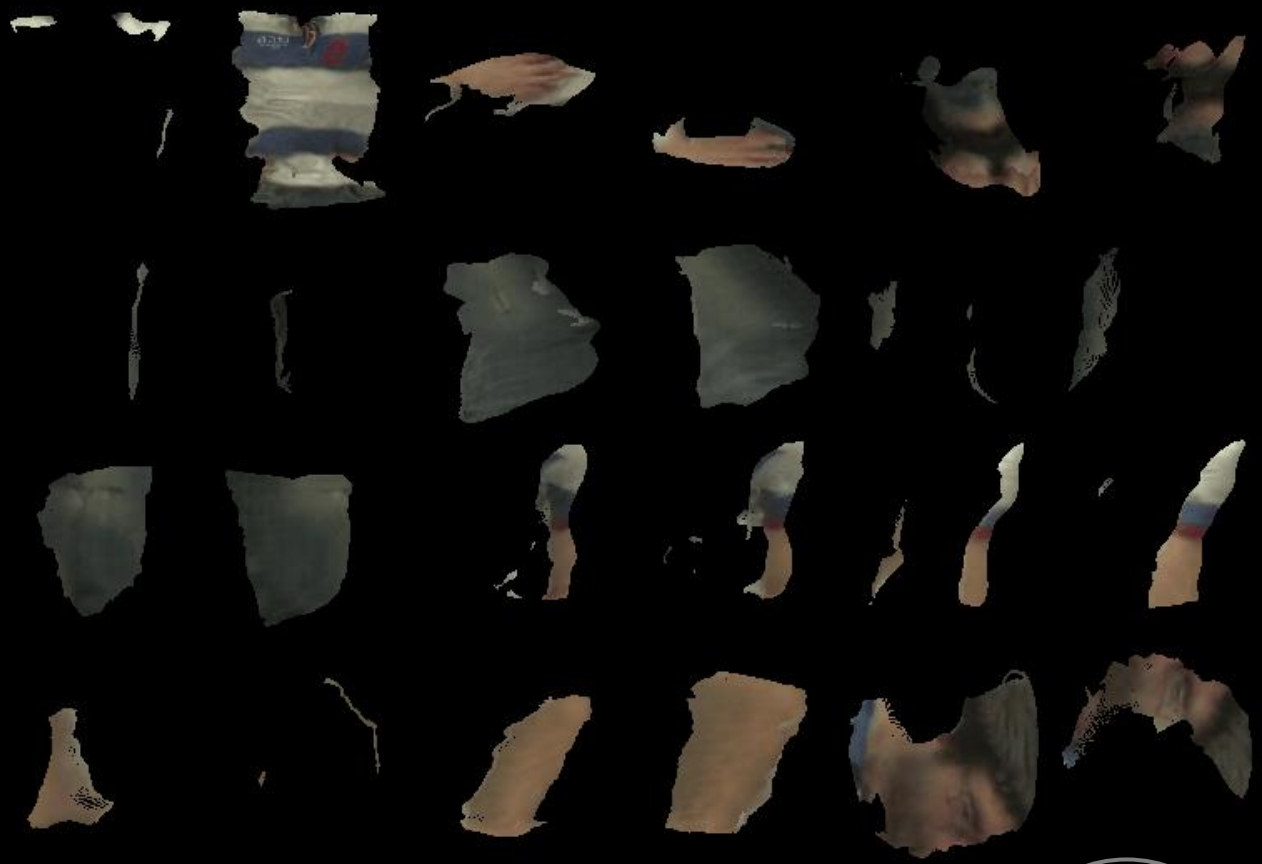


3D UV Volumes

3D Human Performance

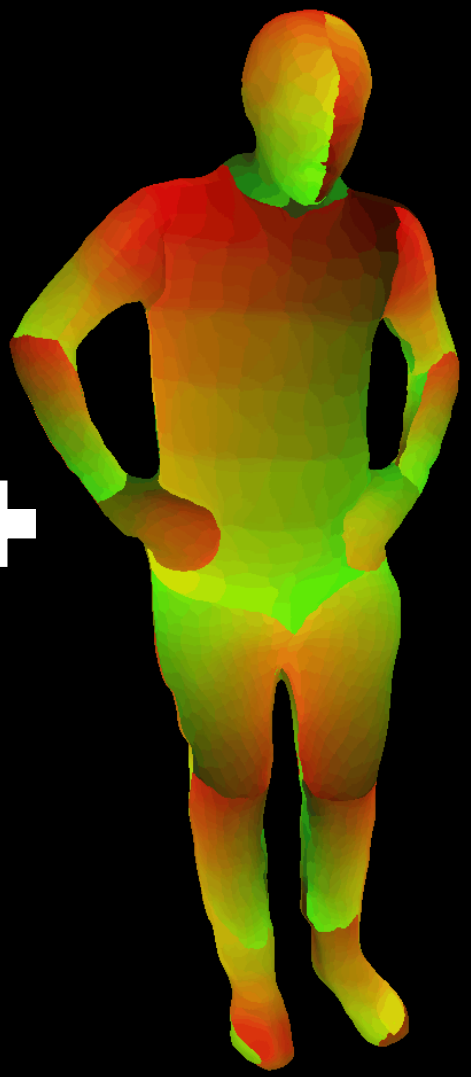
Motivation

34FPS (for rendering only)



Pose-driven & view-dependent
2D Neural Texture Stacks

+



3D UV Volumes

=

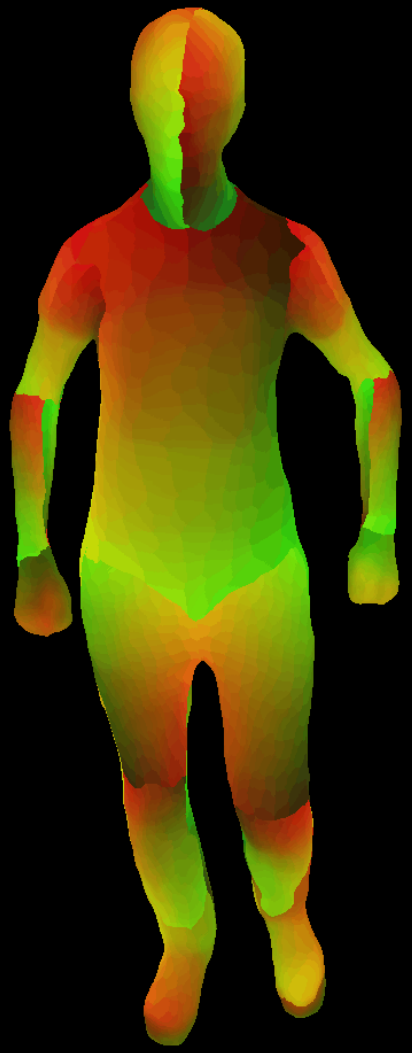
3D Human Performance

Motivation

36FPS (for rendering only)

Pose-driven & view-dependent
2D Neural Texture Stacks

+



3D UV Volumes

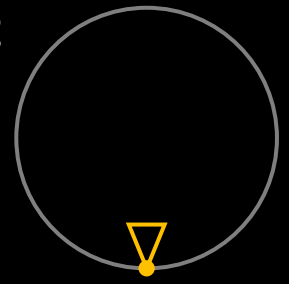
=

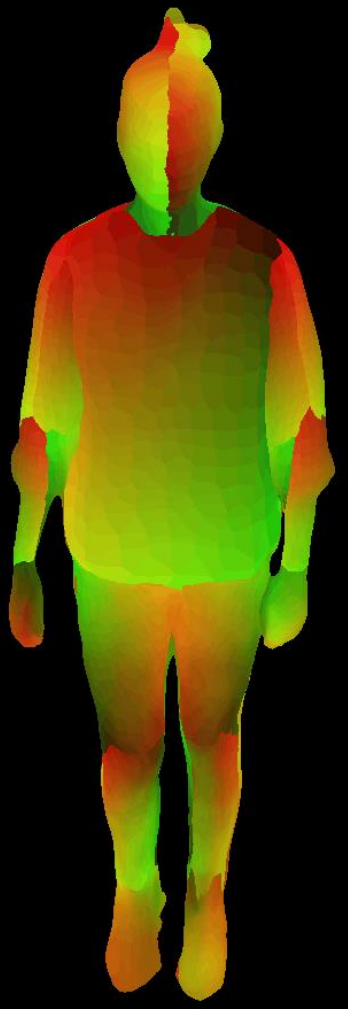
3D Human Performance

Motivation

34FPS (for rendering only)

Pose-driven & view-dependent
2D Neural Texture Stacks

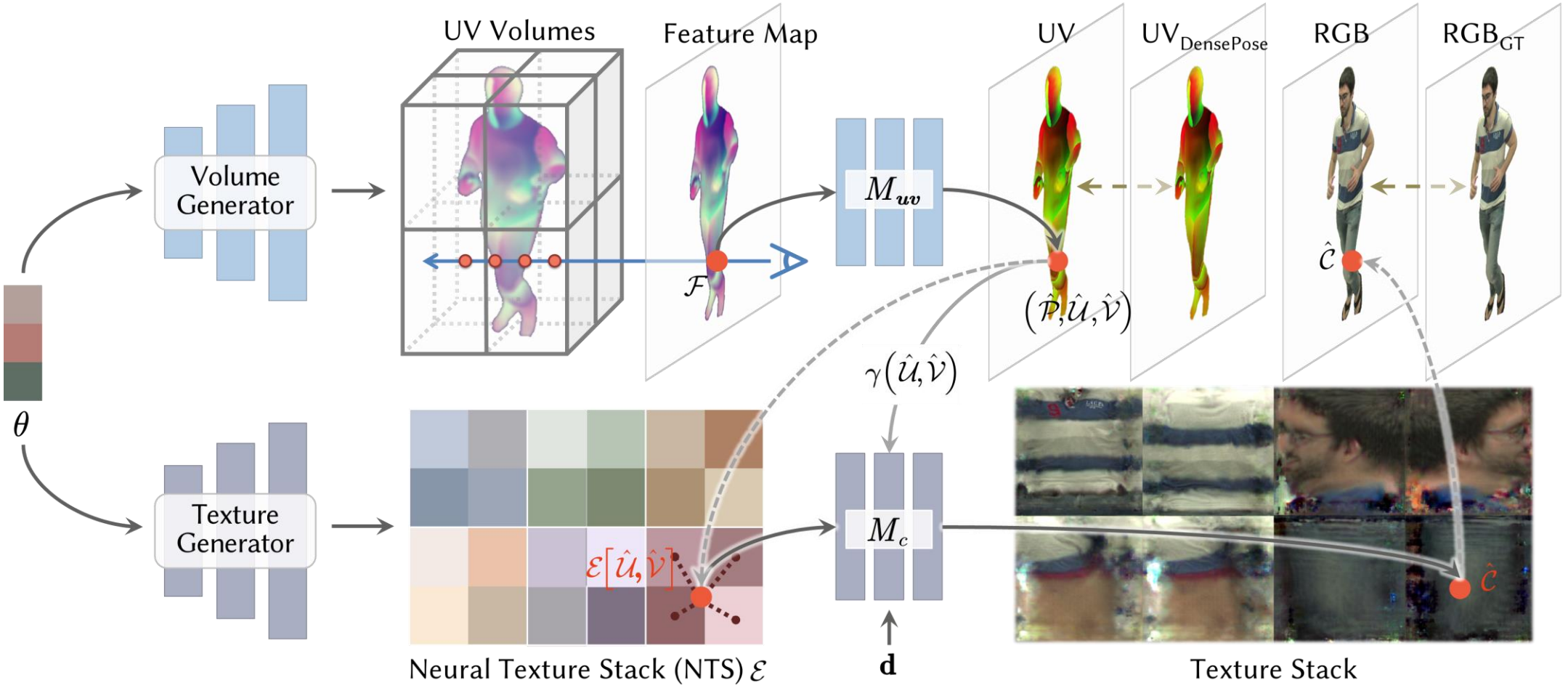




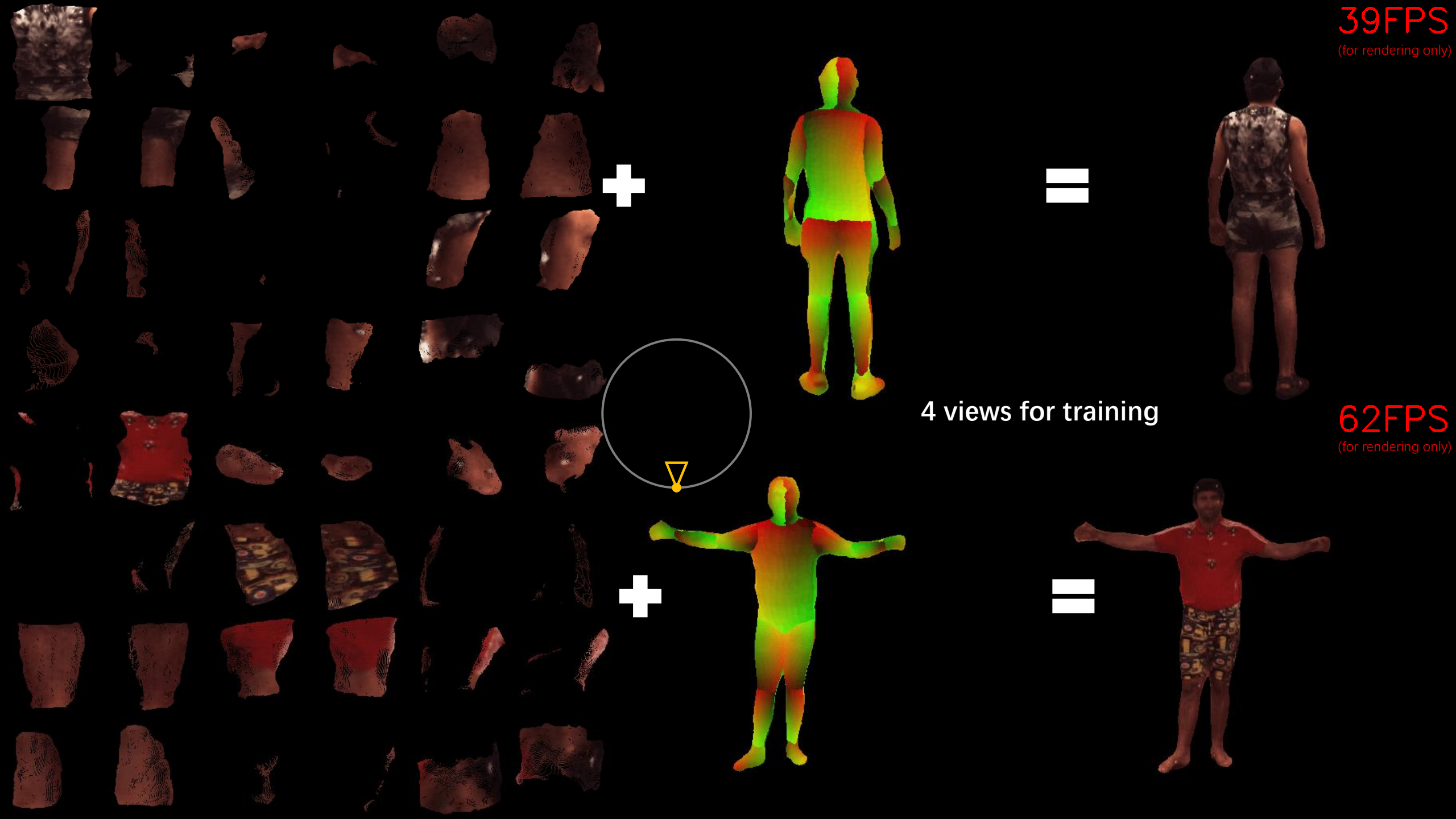
3D UV Volumes

3D Human Performance

Method

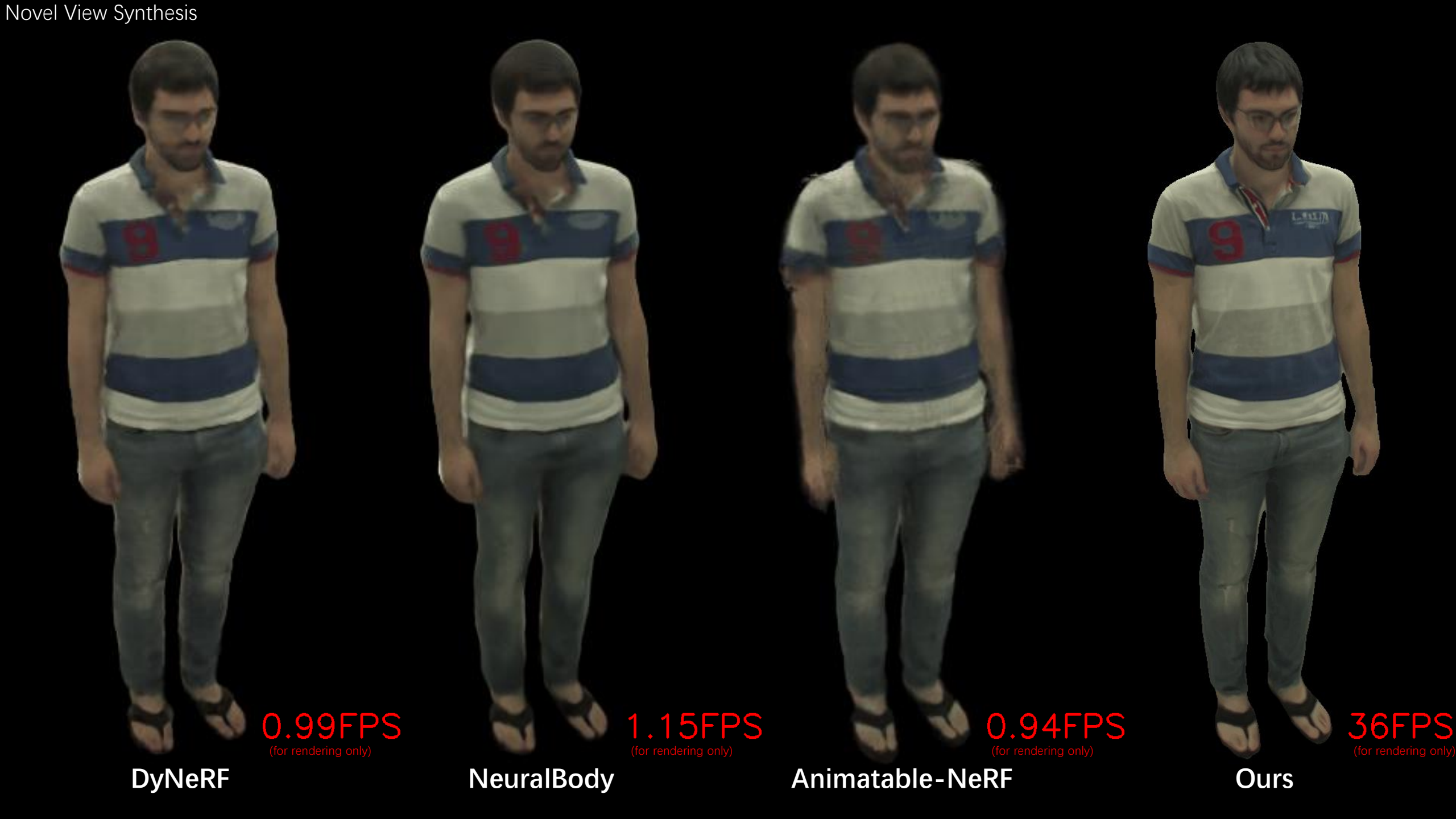

UV Volumes
Feature Map
UV
UV$_{\text{DensePose}}$
RGB
RGB$_{\text{GT}}$
Volume Generator
M_{uv}
$\mathcal{F}$
$(\hat{\mathcal{P}},\hat{\mathcal{U}},\hat{\mathcal{V}})$
$\hat{\mathcal{C}}$
θ
$\gamma(\hat{\mathcal{U}},\hat{\mathcal{V}})$
Texture Generator
$\mathcal{E}[\hat{\mathcal{U}},\hat{\mathcal{V}}]$
M_c
$\hat{\mathcal{C}}$
Neural Texture Stack (NTS) $\mathcal{E}$
$\mathbf{d}$
Texture Stack

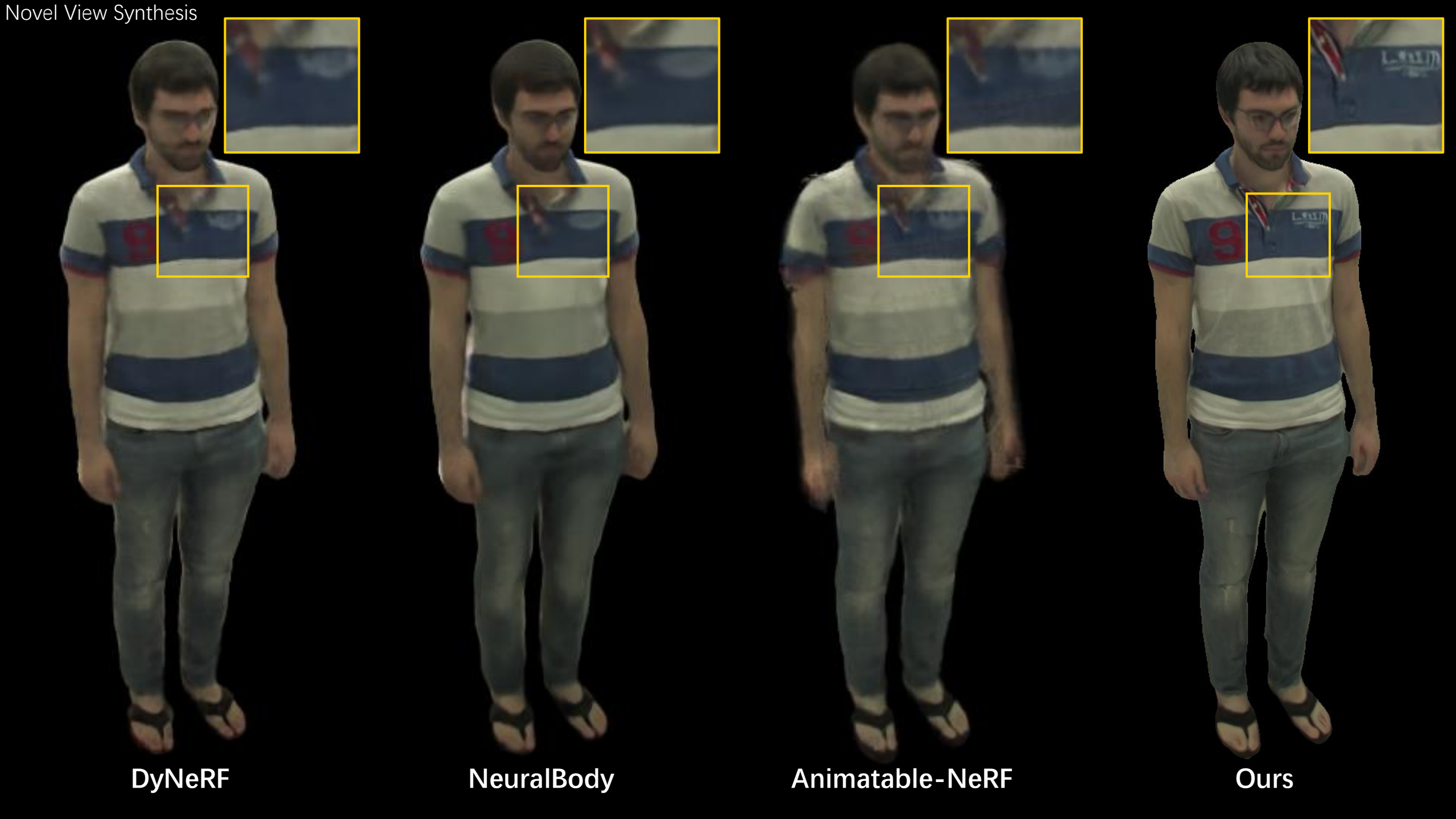
Learning from noisy UV labels


39FPS
(for rendering only)
4 views for training
62FPS
(for rendering only)

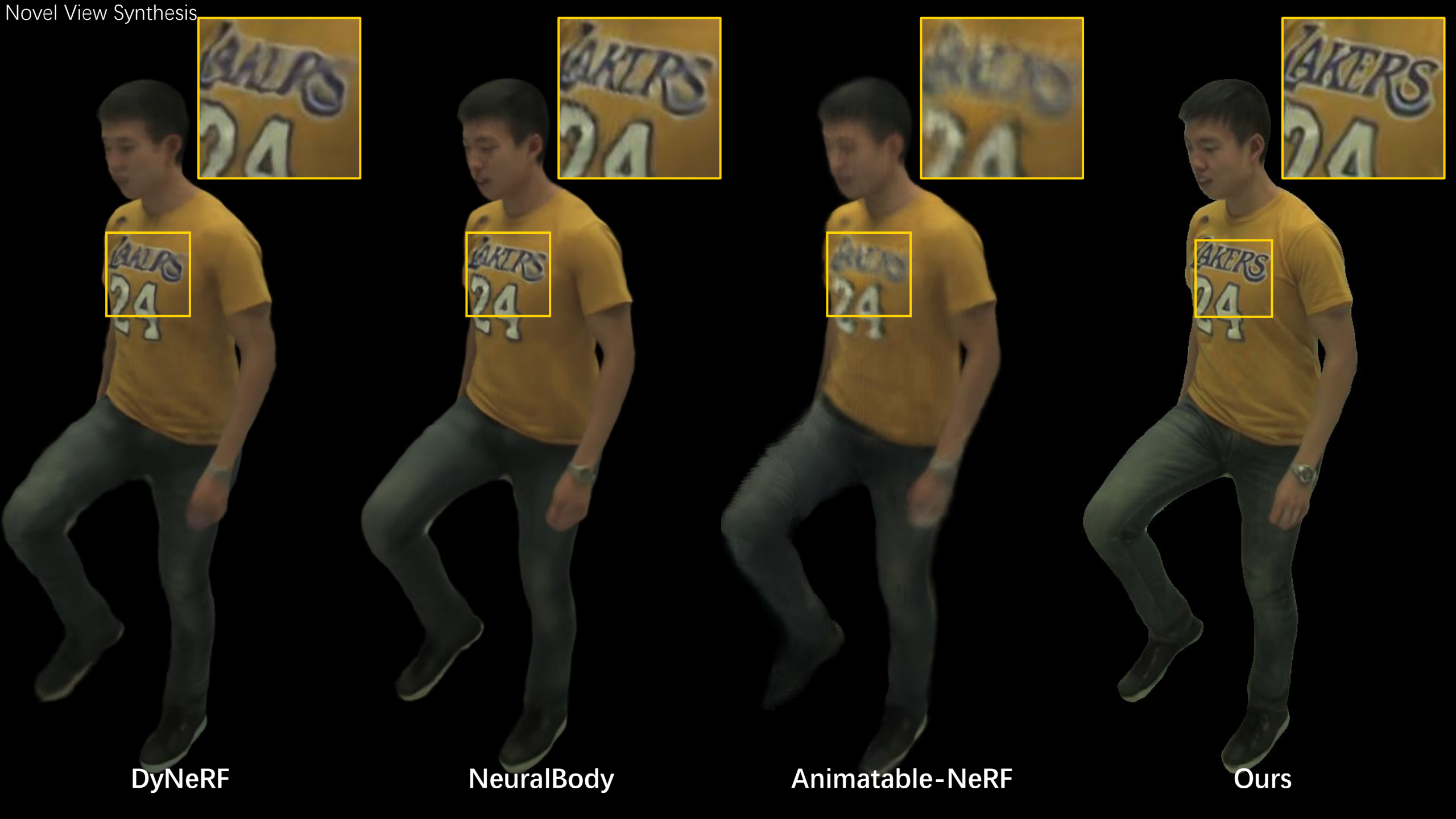
Novel View Synthesis

Novel View Synthesis




Novel View Synthesis
DyNeRF
NeuralBody
Animatable-NeRF
Ours

Novel View Synthesis


Novel View Synthesis
DyNeRF
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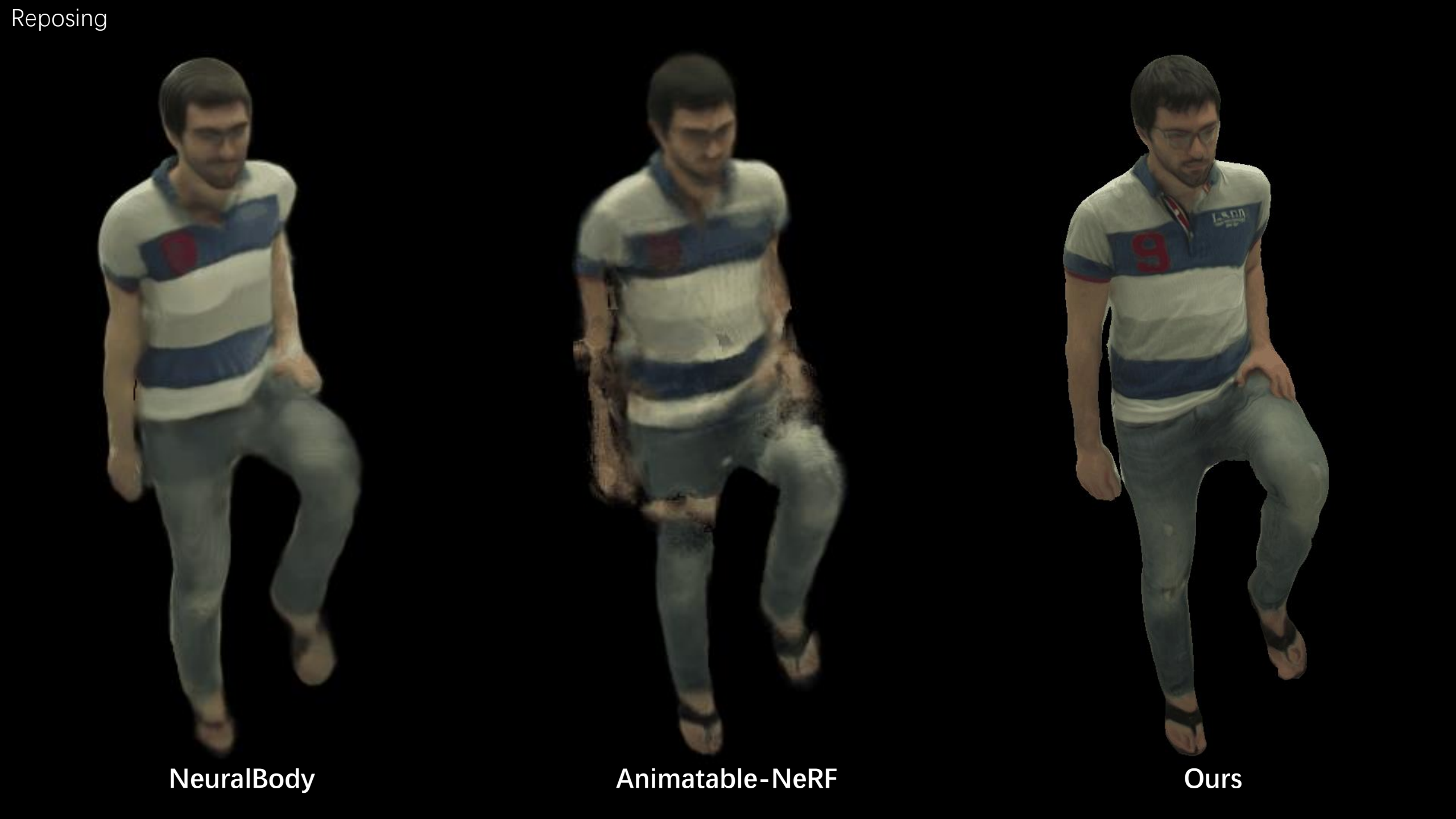
Ours

Reposing

Reposing



NeuralBody

Animatable-NeRF

Ours

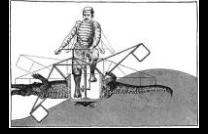
Reposing

Reshaping

Reshaping

Retexturing

LAKERS
24

LAKERS
24


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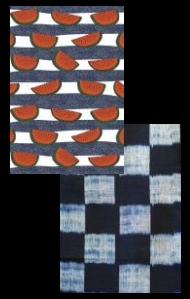
LAKERS
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