



CVPR 2020

Optical Non-Line-of-Sight Physics-based 3D Human Pose Estimation

Carnegie Mellon University



Mariko Isogawa



Ye Yuan



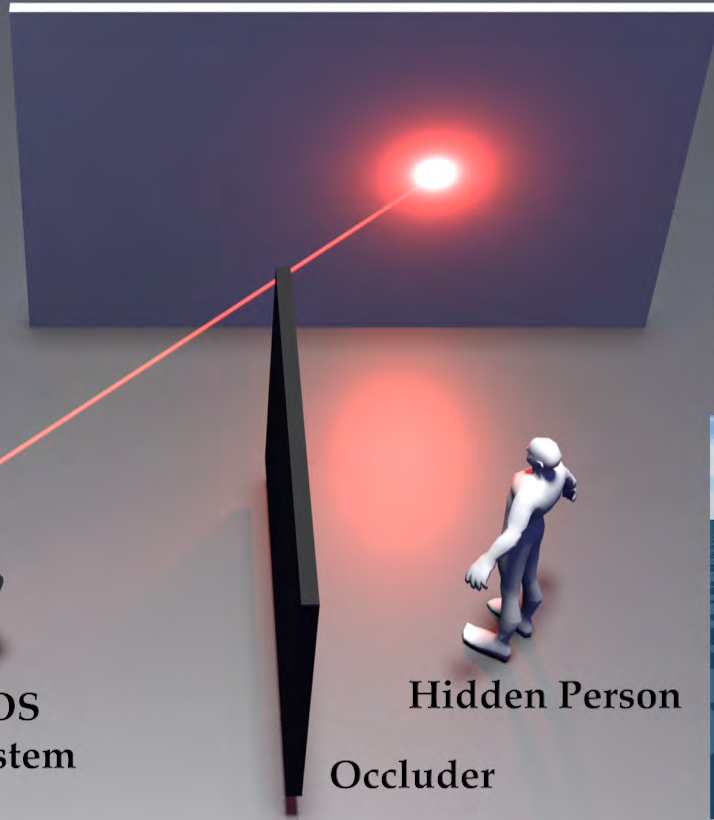
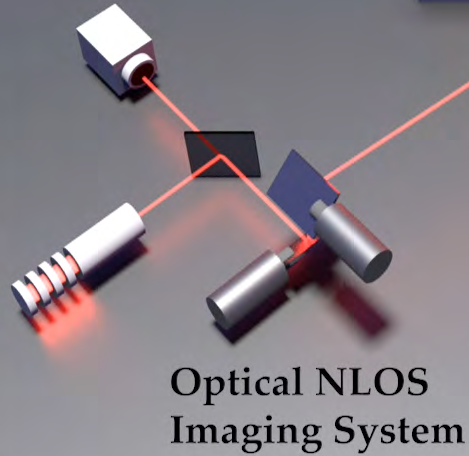
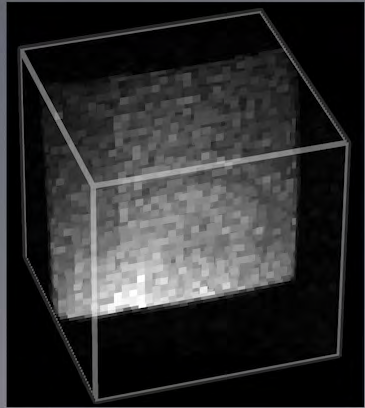
Matthew O'Toole



Kris Kitani

Visible Wall

Input:
Transient Image
(Reflected Light)



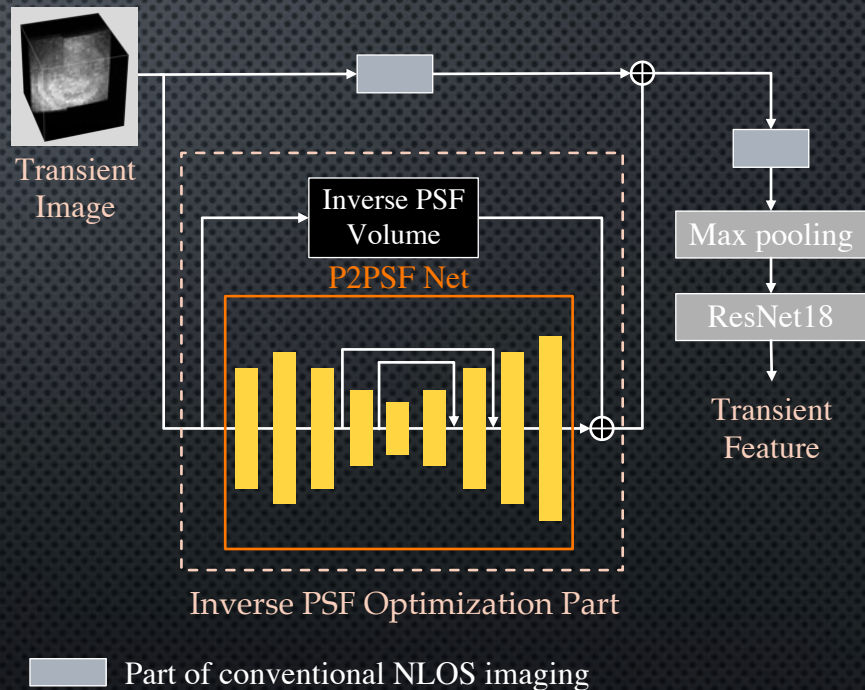
Output:
3D Human Pose



Physics-based 3D human pose estimation by “looking around corners”

Contributions

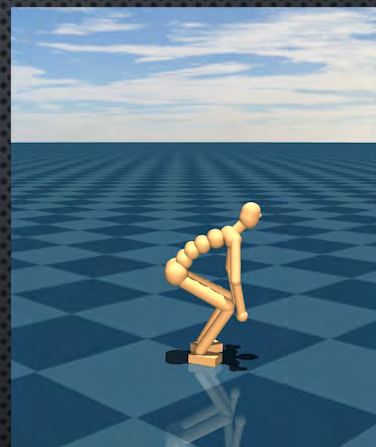
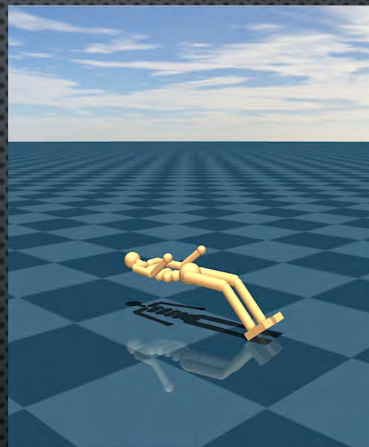
1. Learnable inverse PSF to convert transient images into deep feature vector
2. Humanoid control policy conditioned on the transient image feature
3. Training data synthesis strategy



Contributions

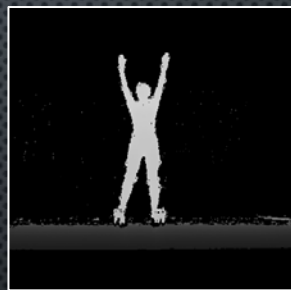
1. Learnable inverse PSF to convert transient images into deep feature vector
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Before Training **After Training**

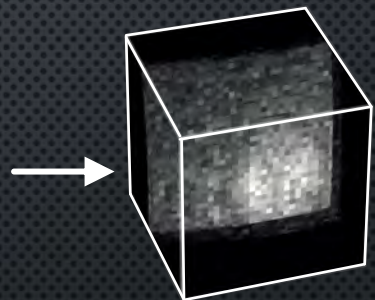


Contributions

1. Learnable inverse PSF to convert transient images into deep feature vector
2. Humanoid control policy conditioned on the transient image feature
3. Training data synthesis strategy



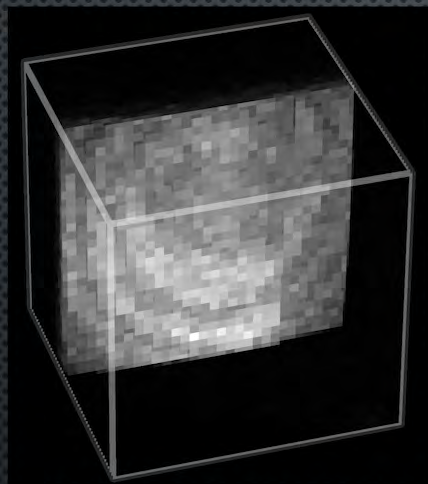
Depth image
w/ MoCap data



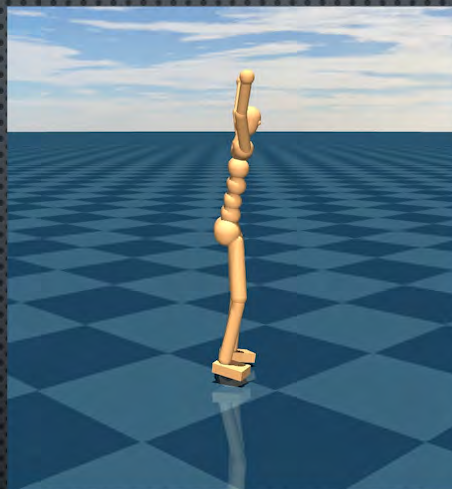
Pseudo
transient image

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Mariko Isogawa, Ye Yuan, Matthew O'Toole, Kris Kitani (Carnegie Mellon University)



Transient Image (Input)



3D Human Pose (Output)



Person Hidden by Wall



Project page:

[marikoisogawa.github.io
/project/nlos_pose.html](https://marikoisogawa.github.io/project/nlos_pose.html)



YouTube:

www.youtube.com/watch?v=4HFulrdmLE8

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