MULTIPLE PEOPLE TRACKING AND POSE ESTIMATION

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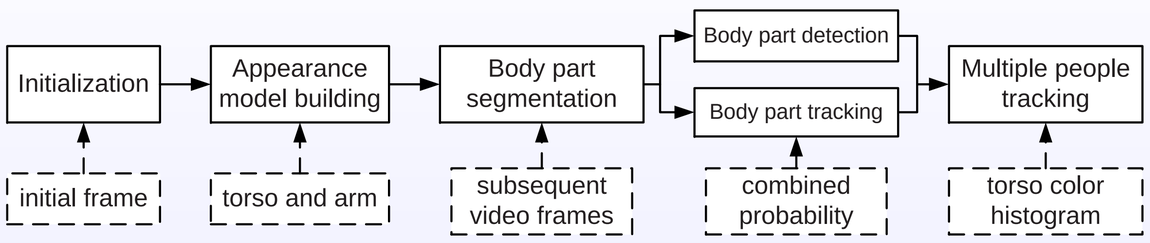
Abstract

Currently, multiple people tracking and pose estimation have drawn more and more attention due to their large application domains. In this poster we present a combined probability estimation approach to detect and track multiple people for pose estimation. It can deal with partial and total occlusion between persons by adding torso appearance to the tracker. Moreover, the upper body of each individual is further segmented into head, torso, upper arm and lower arm in a hierarchical way. The joints location and angles are obtained for pose estimation and can be used for pose recognition.

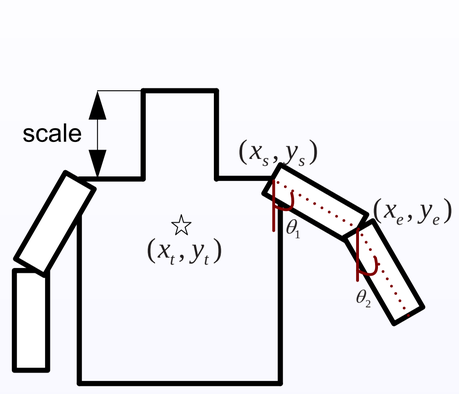
Methodology

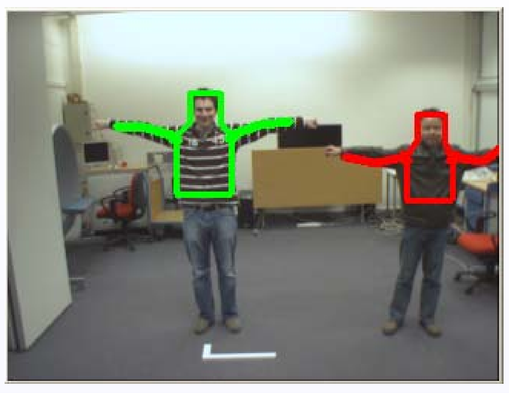
The flowchart of the proposed multiple people tracking and pose estimation system.



Combined Probability

2D-upper-body model of torso and head: $P(x_t, y_t, scale)$
2D image patch for upper and lower arms: $IP(x, y, \theta)$





Combined probability:

$\rho_{IP(x,y,\theta)} = \alpha \times \rho_f + \beta \times \rho_a + \gamma \times \rho_e$

ρ_f is foreground probability.

$\rho_f = \frac{Nonzeropixel[IP(x,y,\theta)]}{Area[IP(x,y,\theta)]}$

ρ_a is appearance similarity between target and candidate model measured by euclidean distance.

$\rho_a = AppSim[IP(x,y,\theta), IP'(x,y,\theta)]$

ρ_e is related to image patch parallel edges.

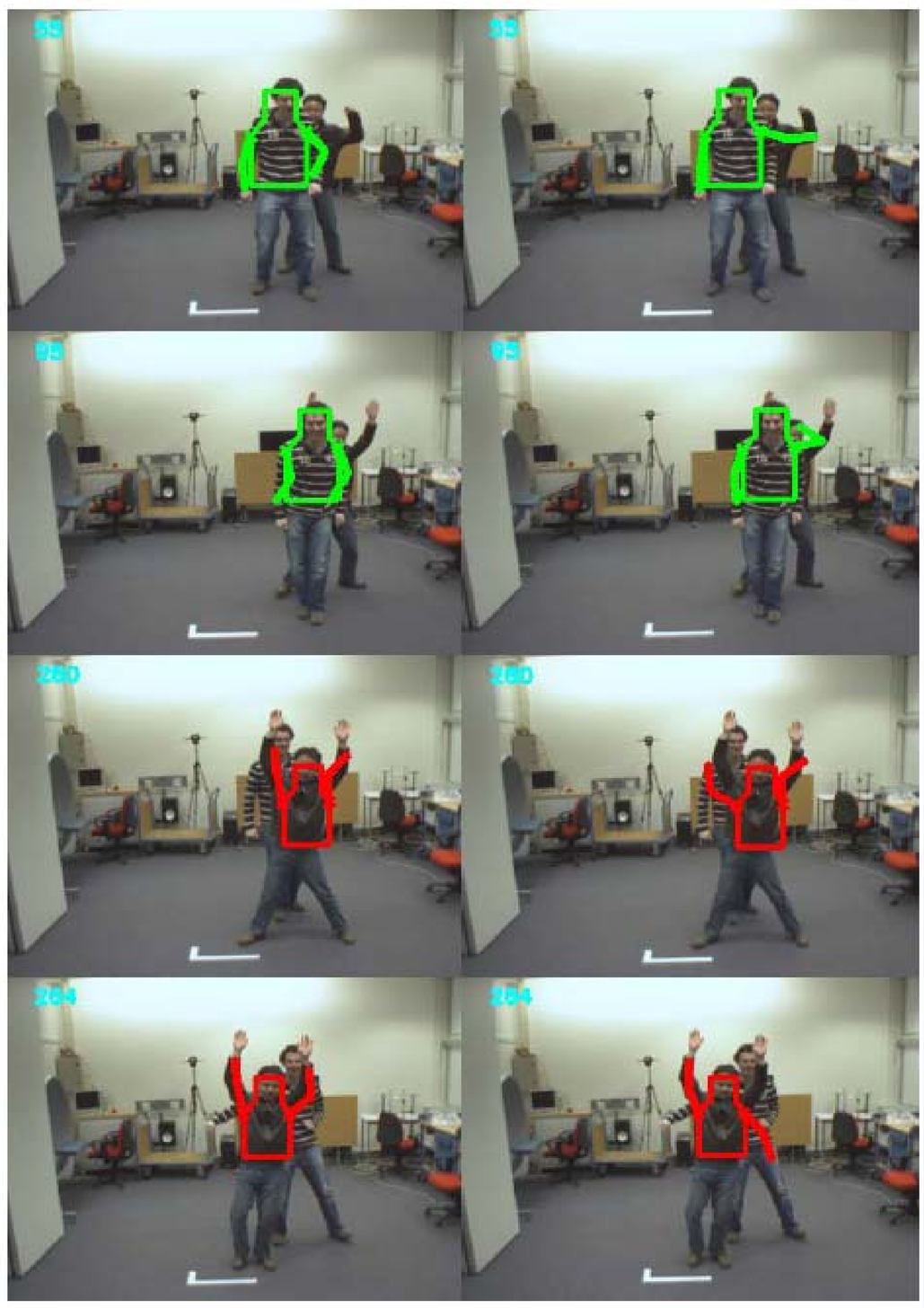
$\rho_e = ParEdge[IP(x,y,\theta)]$

Occlusion Estimation

With occlusion estimation, α, β and γ is changed according to the scene. Without occlusion estimation, α, β and γ is kept constant and no occlusion is taken into account.

Experimental Results

Pose estimation results: with (left column)/ without (right column) occlusion estimation.



Conclusion:
Adapting the weight values of the front person improves the pose estimation in case of occlusion.

Acknowledgements

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