Structured Feature Learning for Pose Estimation

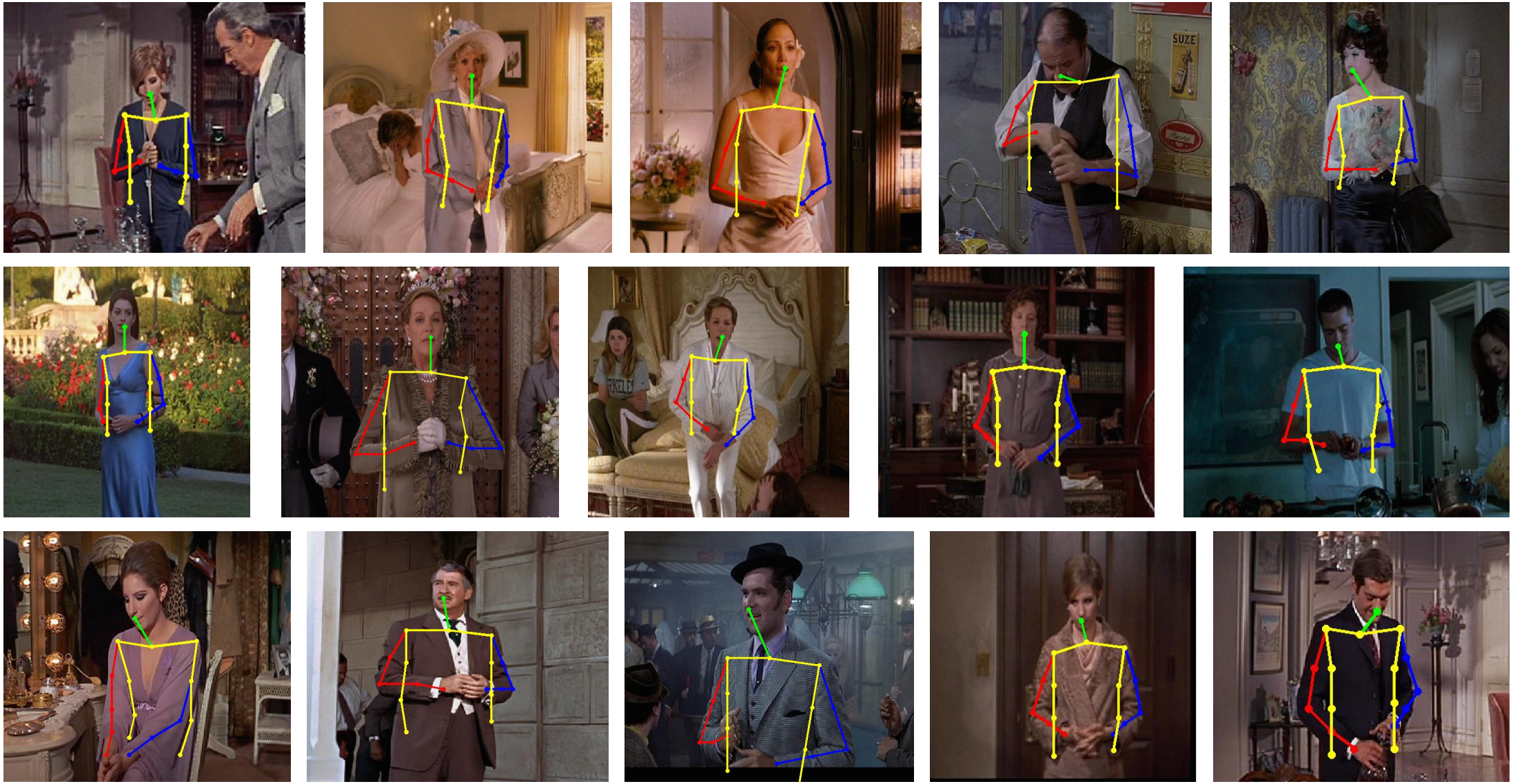
Paper ID: 107

Pose estimation results on the FLIC dataset

Our method Correctly handling the self-occlusion problem caused by rising hands up.

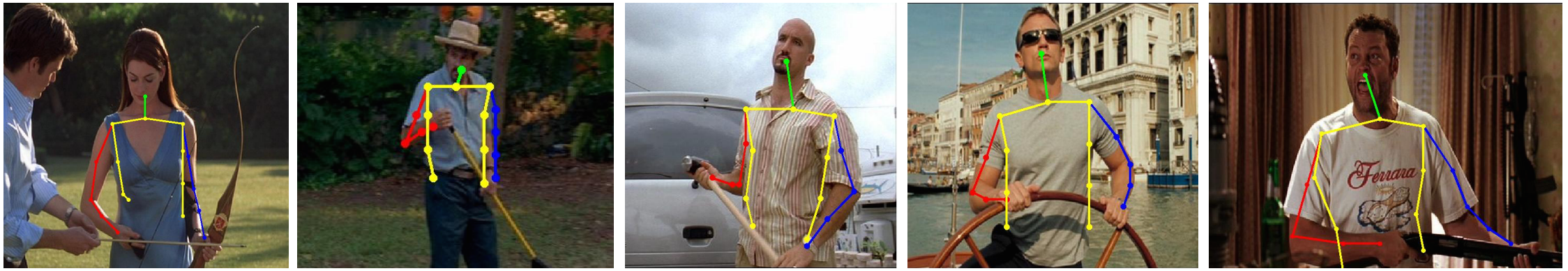
Pose estimation results on the FLIC dataset

The neurons which capture the co-occurrence of two wrists could prevent double counting.



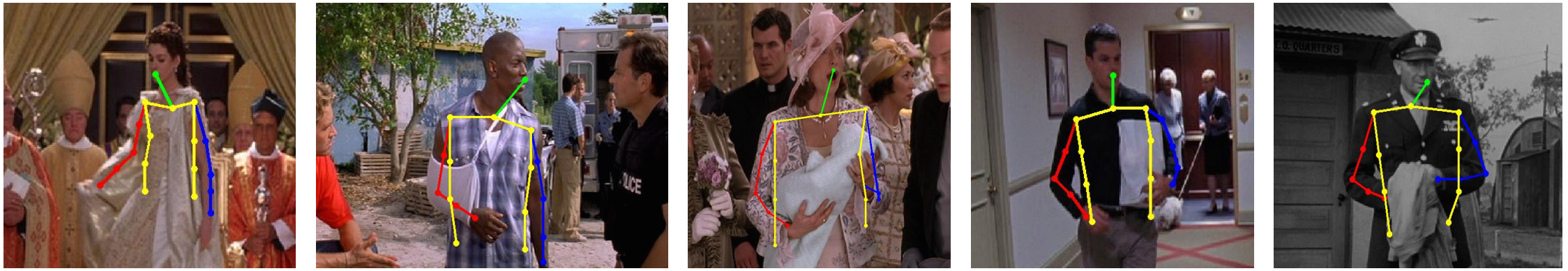
Pose estimation results on the FLIC dataset

Robust to disturbance



Our method is robust to the background objects with similar visual patterns with arms, such as bow, hoe and rudder. Feature level descriptions not only capture edge information, but also extra information such as skin color.

Robust to occlusion



Our method is robust to occlusion. People may wear abnormal clothes or hold something in their arms, which lead to occlusion. Bi-directional tree model jointly considers information from different directions, and hence is robust to local occlusion.

Cross-method comparison of U.arm and L.arm

Ground truth

Predications

Tompson CVPR[1]

Chen and Yuille NIPS[2]

Ours

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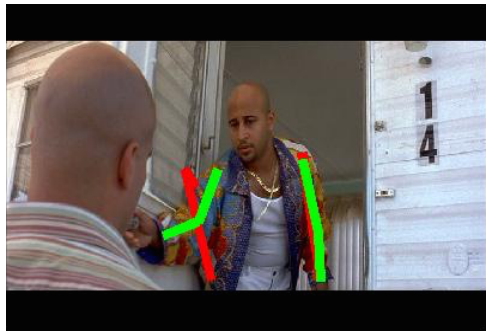
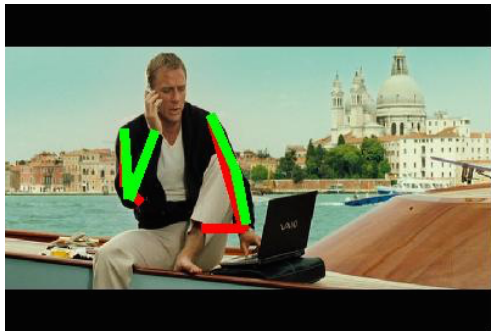
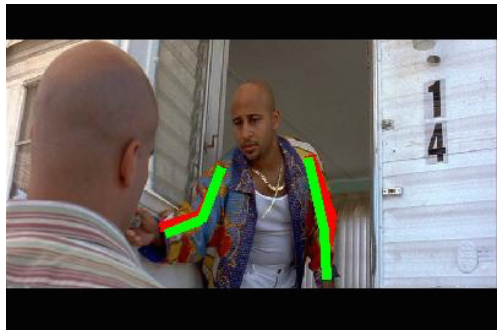


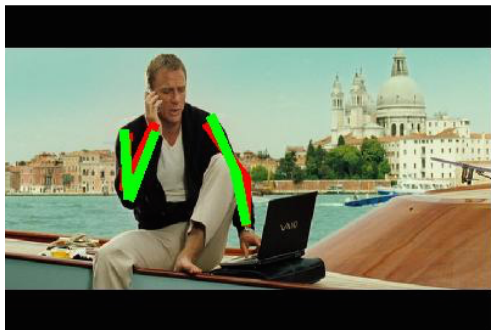



Chen and Yuille NIPS[2]




Ours



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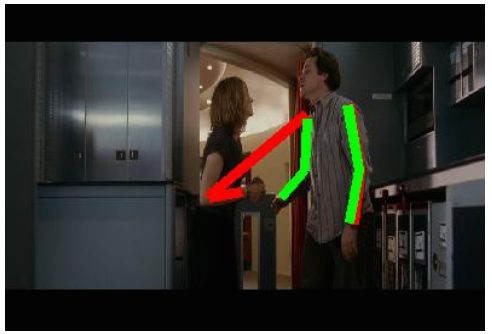
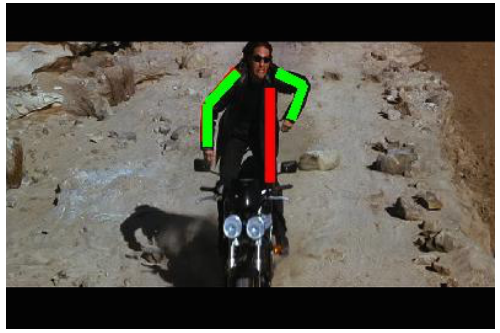



Chen and Yuille NIPS[2]

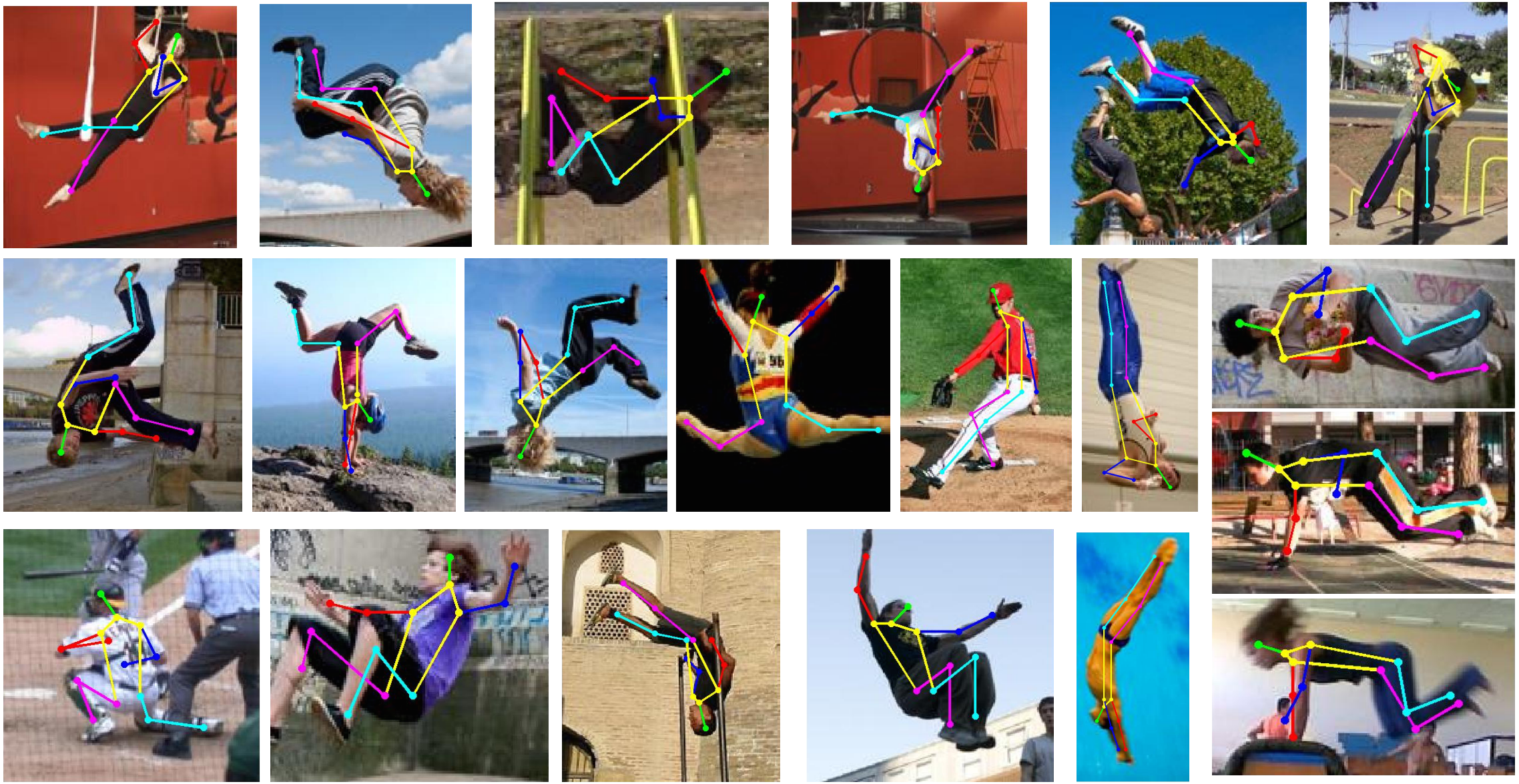



Ours



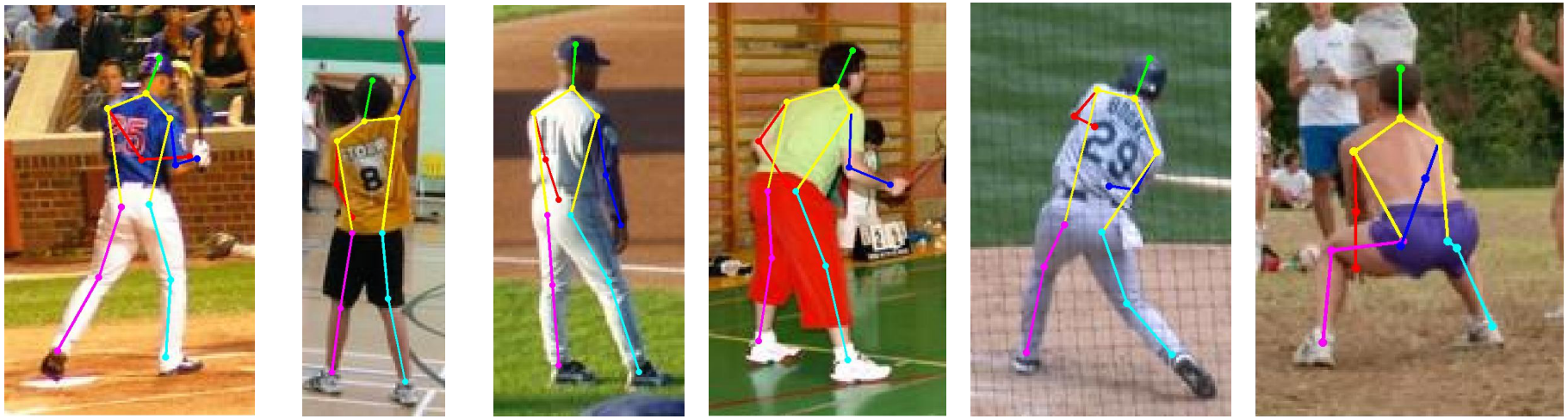

Pose estimation results on the LSP Dataset

Correct reasoning on extreme poses.

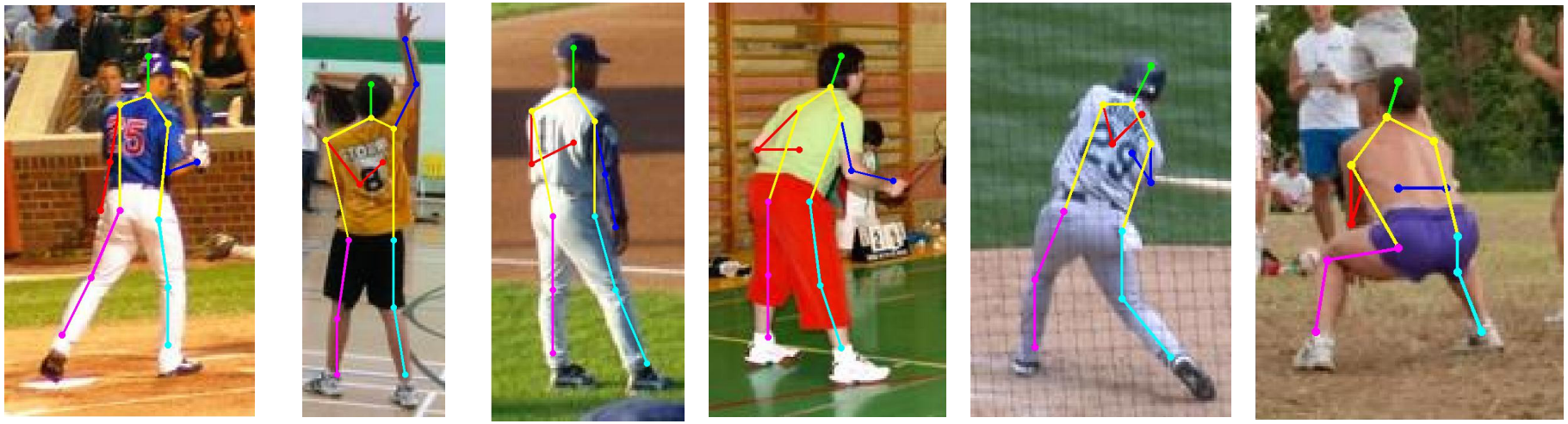


Although different from ground truth annotations, the predictions of occluded body joints are reasonable.

Ground truth



Our predictions



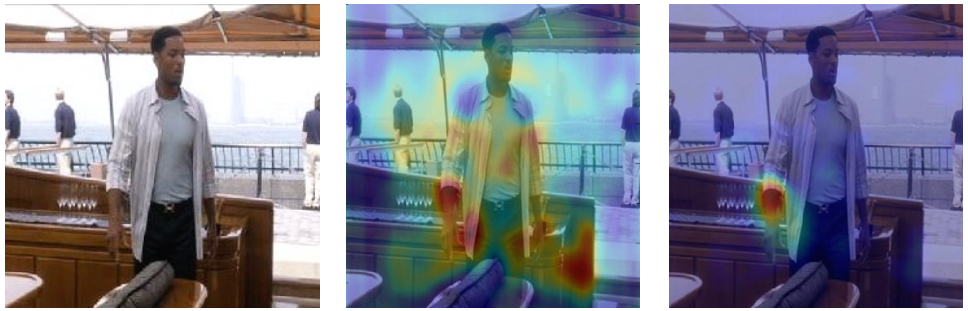
Feature map update --- Torso

Input Before update After update

Input Before update After update

Feature map update --- Lower arm

Input Before update After update



Input Before update After update

Feature map update --- Shoulder

Feature map update --- Elbow

Feature map update --- Neck

Input Before update After update

Input Before update After update

Fully connected graph is not a suitable structure for our method

Fully connected graph: feature maps for shoulder which collect information directly form all the other joints.

Tree graph: feature maps for shoulder which collect information directly from upper arm and indirectly from elbow, lower arm and wrist.