

Light-Weight Network for Real-Time Pose Estimation

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Abstract : The effective and efficient human pose estimation algorithm is an important task for real-time human pose estimation on mobile devices. This paper proposes a light-weight human key points detection algorithm, Light-Weight Network for Real-Time Pose Estimation (LWPE). LWPE uses light-weight backbone network and depthwise separable convolutions to reduce parameters and lower latency. LWPE uses the feature pyramid network (FPN) to fuse the high-resolution, semantically weak features with the low-resolution, semantically strong features. In the meantime, with multi-scale prediction, the predicted result by the low-resolution feature map is stacked to the adjacent higher-resolution feature map to intermediately monitor the network and continuously refine the results. At the last step, the key point coordinates predicted in the highest-resolution are used as the final output of the network. For the key-points that are difficult to predict, LWPE adopts the online hard key points mining strategy to focus on the key points that hard predicting. The proposed algorithm achieves excellent performance in the single-person dataset selected in the AI (artificial intelligence) challenge dataset. The algorithm maintains high-precision performance even though the model only contains 3.9M parameters, and it can run at 225 frames per second (FPS) on the generic graphics processing unit (GPU).

Keywords : depthwise separable convolutions, feature pyramid network, human pose estimation, light-weight backbone

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