عنوان مقاله:

Multi-Task Learning Using Uncertainty for Realtime Multi-Person Pose Estimation

محل انتشار:

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خلاصه مقاله:

kground and Obejctives: Multi-task learning is a widespread mechanism to improve the learning of multiple objectives with a shared representation in one deep neural network. In multi-task learning, it is critical to determine how to combine the tasks loss functions. The straightforward way is to optimize the weighted linear sum of multiple objectives with equal weights. Despite some studies that have attempted to solve the realtime multi-person pose estimation problem from a ۲D image, major challenges still remain unresolved. Methods: The prevailing solutions are two-stream, learning two tasks simultaneously. They intrinsically use a multi-task learning approach for predicting the confidence maps of body parts and the part affinity fields to associate the parts to each other. They optimize the average of the two tasks loss functions, while the two tasks have different levels of difficulty and uncertainty. In this work, we overcome this problem by applying a multi-task objective that captures task-based uncertainties without any additional parameters. Since the estimated poses can be more certain, the proposed method is called “CertainPose”. Results: Experiments are carried out on the COCO keypoints data sets. The results show that capturing the task-dependent uncertainty makes the training procedure faster and causes some improvements in human pose estimation. Conclusion: The highlight advantage of our method is improving the realtime multi-person pose estimation without increasing computational complexity.

کلمات کلیدی:

Realtime Multi-Person Pose Estimation, Multi-Task Learning, Loss Function, Task-Dependent Uncertainty