Online Pose Estimation and Tracking Approach with Siamese Region Proposal Network

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Abstract : Human pose estimation and tracking are to accurately identify and locate the positions of human joints in the video. It is a computer vision task which is of great significance for human motion recognition, behavior understanding and scene analysis. There has been remarkable progress on human pose estimation in recent years. However, more researches are needed for human pose tracking especially for online tracking. In this paper, a framework, called PoseSRPN, is proposed for online single-person pose estimation and tracking. We use Siamese network attaching a pose estimation branch to incorporate Single-person Pose Tracking (SPT) and Visual Object Tracking (VOT) into one framework. The pose estimation branch has a simple network structure that replaces the complex upsampling and convolution network structure with deconvolution. By augmenting the loss of fully convolutional Siamese network with the pose estimation task, pose estimation and tracking can be trained in one stage. Once trained, PoseSRPN only relies on a single bounding box initialization and producing human joints location. The experimental results show that while maintaining the good accuracy of pose estimation on COCO and PoseTrack datasets, the proposed method achieves a speed of 59 frame/s, which is superior to other pose tracking frameworks.

Keywords : computer vision, pose estimation, pose tracking, Siamese network

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