Single-Camera Basketball Tracker through Pose and Semantic Feature Fusion

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Abstract : Tracking sports players is a widely challenging scenario, specially in single-feed videos recorded in tight courts, where cluttering and occlusions cannot be avoided. This paper presents an analysis of several geometric and semantic visual features to detect and track basketball players. An ablation study is carried out and then used to remark that a robust tracker can be built with Deep Learning features, without the need of extracting contextual ones, such as proximity or color similarity, nor applying camera stabilization techniques. The presented tracker consists of: (1) a detection step, which uses a pretrained deep learning model to estimate the players pose, followed by (2) a tracking step, which leverages pose and semantic information from the output of a convolutional layer in a VGG network. Its performance is analyzed in terms of MOTA over a basketball dataset with more than 10k instances.

Keywords : basketball, deep learning, feature extraction, single-camera, tracking
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