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An Automated Player Detection and Tracking in Basketball Game

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Abstract: Vision-based player recognition is critical in sports applications. Accuracy, efficiency, and Low memory utilization is alluring for ongoing errands, for example, astute communicates and occasion classification. We developed an algorithm that tracks the movements of different players from a video of a basketball game. With their position tracked, we then proceed to map the position of these players onto an image of a basketball court. The purpose of tracking player is to provide the maximum amount of information to basketball coaches and organizations, so that they can better design mechanisms of defence and attack. Overall, our model has a high degree of identification and tracking of the players in the court. We directed investigations on soccer, basketball, ice hockey and pedestrian datasets. The trial comes about an exhibit that our technique can precisely recognize players under testing conditions. Contrasted and CNNs that are adjusted from general question identification systems, for example, Faster-RCNN, our approach accomplishes cutting edge exactness on three sorts of recreations (basketball, soccer and ice hockey) with 1000×fewer parameters. The all-inclusive statement of our technique is additionally shown on a standard passer-by recognition dataset in which our strategy accomplishes aggressive execution contrasted and cutting-edge methods.

Keywords: Player detection, basketball game, player tracking, court detection, color classification, mapping, pedestrian detection, heat map.

1 Introduction

Automated player detection and tracking in team-sport games is of growing importance [Petilla, Yap and Zheng et al. (2018)]. As the profits from sports are increasing substantially, teams are heavily in- vested more in gathering statistics on their athletes. Certain statistics, such as distance run during a match, can provide information on player's health [Barris and Button (2008)]. Moreover, real-time detection of players can be valuable in identifying the opponent's formation and strategy, and might give some insight on the likelihood of a certain play be successful. This can lead to better strategies [Lefevre, Bombardier and Charpentier et al. (2018)]. One of the principle challenges in sports science is a target examination of player execution. While an individual player's physical capacities can be promptly tried in the research center, a group's execution must be seen amid a real diversion. This procedure may incorporate propelled investigation strategies, for example, video recording and measurable examination, however it by and

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desired object in an image based on a training data set. For pedestrian detection no single feature has been shown to outperform HOG. However, the performance can be improved by using additional features to provide complementary information [Dollar, Wojek and Schiele et al. (2012)].

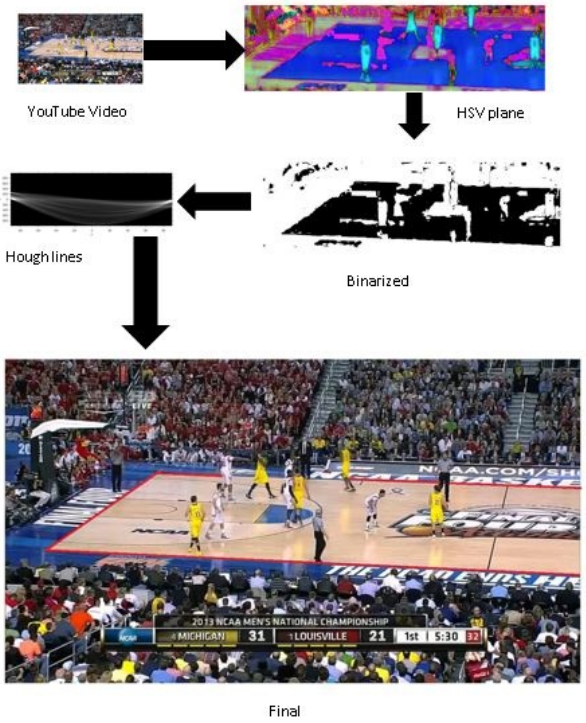

Figure 2: This schematic represents the work performed in order to detect the edge lines of the system

For this research work we used the HOG detector from OpenCV. This was mainly motivated by the fact that OpenCV has already a default data set for pedestrian detections, and that the HOG feature calculation and SVM were already efficiently implemented. We used the "Daimler" dataset for pedestrian detection. This detector is trained using window size of 48 by 96 pixels. Thus, the HOG detector expects pedestrians to be of at least that size.

Fig. 3 illustrates an example of pedestrian detection of basketball players using HOG descriptors and SVM classifier. The inset in that figure illustrates the HOG descriptors of one of the players as well as an inverse, which corresponds to a reconstructed image from the HOG descriptors. This image shows that HOG descriptors carry significant information of the detection. In the sample frame all players were detected, but there were some false positives, and two players were detected by the same box because they were too close together.