

Detection of Soccer Game Offence/Defence Events in Broadcast Video

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Abstract---- In this paper, basic offense and defense events of soccer game have been undertaken due its significance for the fans in one side, game analysts and team coaches on other side. Offense and defense strategies and capabilities are the most important events in the soccer game because they determine the ability of controlling the play, penetration and even scoring. A straight forward and simple method has been adopted here to perform the detection process.

Keywords---- Offense, Defense, soccer, event.

I. INTRODUCTION

Soccer is the most popular game of the world, so many studies have been conducted to solve the sophisticated problem in detection [1], [2], [4] and tracking [4] the various objects in the game, recognizing the events [3], and other study aspects.

In spite of different challenging problems still difficult to solve in those studies like accurate detection and tracking of the ball [2] because usually the ball is occluded by the players, and the change in the ball size and color due to the spinning and fast move, but in my approach adopted a method less dependent on the accurate detection of the ball as explained in section III.

II. RELATED WORK

Some exist studies [7], [8] considered play styles but unlike [7], in [8] play styles of American football have been taken into consideration, however it's more similar to the events of interest and almost adopted the same methodology.

III. SYSTEM OVERVIEW

Fig. 1 shows the system construction; this diagram is inspired from [5].

Foreground mask is performed by combining both Gaussians mixture model (GMM) and color elimination with some morphological operations.

Then Hough transform is exploited to extract the line in order to remove them later, after refining lines; some non-continuous lines remain with undesired dots. Using contours, and contours size to remove the undesired parts by putting specific threshold.

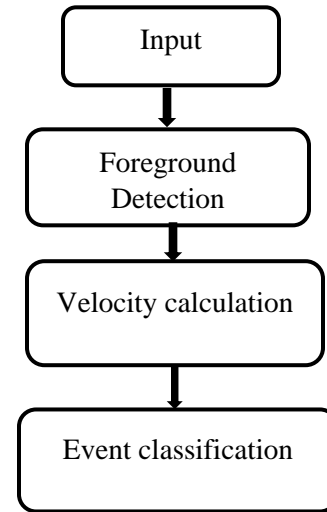


Fig. 1: System construction

IV. CONCEPTUALIZATION

- Offence is the way of pinching off the area of the opponent team with intention of scoring a goal.
- Defense is repelling the offensive team.

To detect offense we consider the absolute value of the velocity and the sign of the components V_x, V_y as in fig. 2, for the positive sign of V_x with specific value it will be considered as attack and the opponent team in a defense condition this idea is inspired from [6]

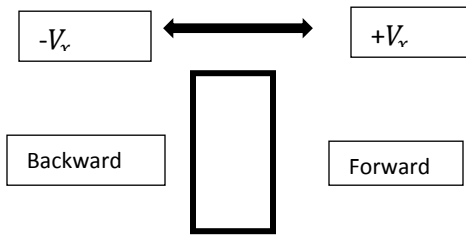


Fig. 2: Velocity exploitation

V. EXPERIMENT AND RESULTS

The algorithm had been run on a video scene from champions league match played between Barcelona and Bayern Munich. The software platform is OpenCV with visual studio 2013, the results as follow:

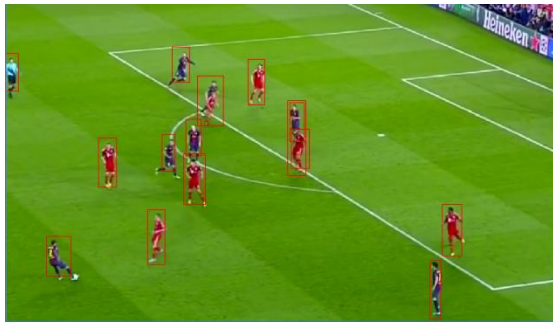


Fig. 3: Detects

VI. CONCLUSION

The purpose of this brief study is to detect basic offense and defense events in soccer game, the algorithm utilizes basic image processing concepts to achieve the target, however more and serious improvement will be exploited later to improve the performance under a complex cases and consider more details regarding the events.

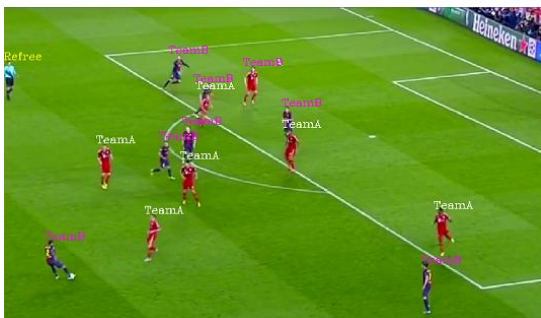


Fig. 4: Team Distinguishing



Fig. 5: Normal defense formation under offense



Fig. 6: Offensive situation with penetration case.

ACKNOWLEDGMENT

The author would like to thank Xiamen University for providing the suitable environment. Also I would like to deliver my gratitude to my friends who supported me.

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