The BRITISH UNIVERSITY IN EGYPT

Title : Analyzing Football Players Performance

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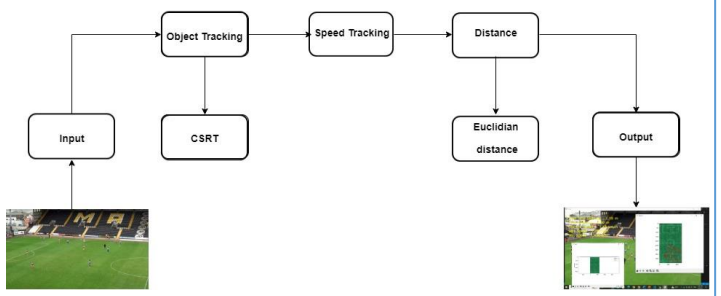
Abstract

This project uses computer vision to detect and track players in a video. The project outputs the speed, max speed, min speed, and a gif for players movement to detect how much distance the player has covered. The goal of this project is to help players perform better technically and physically by providing them with feedback on their performance The project can be used by coaches and players to analyze player performance. Coaches can use the project to identify areas where players need to improve, also players.

Proposed System



System Design/ Interface

CSRT tracking algorithm

is a robust and accurate algorithm that can track objects in videos even under challenging conditions, such as occlusion and illumination changes.

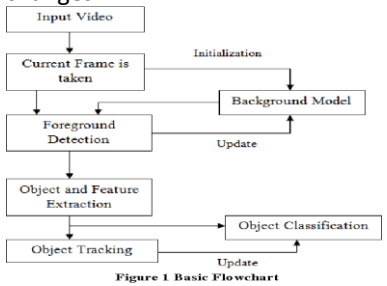
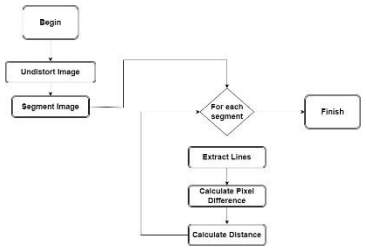


Figure 1 Basic Flowchart

$x_k = A * x_{k-1} + B * u_k + w_k$

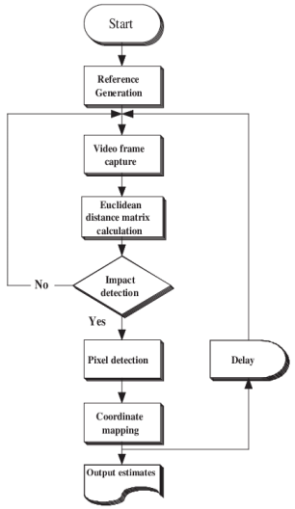
Speed calculation Algorithm



Once the objects have been tracked, their speed can be calculated by measuring the distance they travel between frames. This is done using the distance() function in the cv2 library.
Speed= distance/time

Distance Algorithm

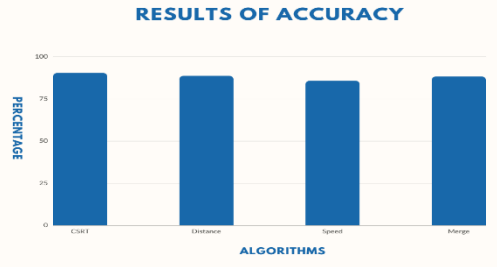
works by first calculating the squared distances between the x-coordinates and the y-coordinates of the two points. It then takes the square root of the sum of these squared distances. This gives us the distance between the two points.



Euclidean filter $d = \sqrt{(x2 - x1)^2 + (y2 - y1)^2}$

PLAYER PERFORMANCE DETECTION, TRACKING USING COMPUTER VISION

Results



The accuracy of the **CSRT** was 90.32 % and the **Distance**: 88.6% and the **Speed:** 85.7% and after merging them they got 88.2% accuracy.

Conclusions

The tool demonstrates high efficiency by accurately tracking the player's movement, gathering detailed statistics, and creating a visually appealing heat map and GIF that vividly illustrate the player's on-field trajectory. It offers comprehensive analysis and visualization, enabling a thorough evaluation of the player's performance and tactics.