Player Re-Identification - Project Report

1. Approach and Methodology

The goal of this project was to identify and track football players in a 15-second video using a pre-trained object detection model (YOLO).

I started by detecting all the players in the first few frames of the video. I gave each player a unique ID. The main challenge was to keep the same ID for each player, even if they left the video frame and came back later.

To do this, I used a method that checks how close the players' positions are from one frame to the next. I also saved the recent positions of the players so I could match them later if they reappeared.

2. Techniques Tried and Their Outcomes

Position Matching: I compared player positions in each frame to keep their IDs consistent. This worked well when players didn't overlap much.

Distance Calculation: When players moved fast or were close to each other, I used the distance between their centers to help decide who was who.

Basic Memory Storage: I kept a small memory of recent player positions. This helped in giving the same ID to a player even if they left and returned.

3. Challenges Faced

Players wearing similar clothes made it hard to tell them apart based on looks alone.

Sometimes, players overlapped or went behind others, which made tracking confusing.

When players re-entered from different angles or sizes, it became tricky to correctly identify them.

4. Future Improvements

If I had more time and resources, I would:

Try advanced techniques to better recognize players based on their appearance (like using face or body features).

Use smarter tracking algorithms that can guess where a player might move next.

Improve the visual output to clearly show how tracking is working, which would help explain the results better.