Player Re-Identification in Sports Footage – Brief Report

Approach & Methodology

The system is designed for **player detection and re-identification** in football broadcasts using a combination of **YOLOv11** for object detection and a re-identification of players across frames using a tracking **algorithm** for maintaining identities across frames.

Pipeline Overview:

1. **Video Input** – Ingest a broadcast football video.
2. **Object Detection** – Detect players, referees, and football using YOLOv11 (Pre-trained).
3. **Tracking** – Track player movements across frames using REID based logic (trackers/Tracker).
4. **Annotation & Output** – Draw bounding boxes and identity labels on frames and export to video.

Techniques Tried & Outcomes

- **YOLOv11**: Used as the detection backbone. A Pre-trained model (best.pt) detects players with decent accuracy.
- **Re-identification/Tracking**: Achieved through the Tracker class, which maintains identities and saves results in .pkl stubs for fast re-use.
- **Output Video Rendering**: Annotated frames are recompiled into an .avi video.

Challenges Encountered

- **Performance**: Real-time performance may degrade depending on video resolution and system resources.
- **Re-ID Accuracy**: Accurate player re-identification remains a challenge in cases of occlusion or jersey number ambiguity.