

Player Re-Identification - Project Report

1. Approach and Methodology

The task involved re-identifying football players in a single video feed while ensuring consistent IDs even after players left and re-entered the frame. We used a fine-tuned YOLOv11 object detection model for identifying players and DeepSORT for multi-object tracking. The input was a 15-second football video. The model detected both players and the ball, but filtering was applied to retain only player-class detections before passing them to the tracker.

2. Techniques Tried and Their Outcomes

Initially, YOLOv11 detections were passed directly to DeepSORT, but the tracker also picked up the ball as a player due to class overlap. To resolve this, class filtering logic was implemented to ignore non-player classes (e.g., ball). Once filtered, the DeepSORT tracker performed accurately, assigning persistent IDs even after temporary occlusion or re-entry of players.

3. Challenges Encountered

- Misclassification of the ball as a player by the detection model.
- Ensuring stable tracking of players across frames, especially during occlusion.
- Visual clutter in the output when player IDs briefly swapped before DeepSORT re-initialized tracking.

These were resolved by applying class filtering and tuning DeepSORT parameters (max_age and cosine distance threshold).

4. Future Improvements

The current implementation works well for a short clip but could be improved with:

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- Appearance embeddings for more robust re-identification across longer sequences.
- A refined custom model trained with better class distinction between players and ball.
- Real-time frame-by-frame inference optimization for live video feeds.