Player Tracking using YOLOv11 - Brief Report

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1. Approach and Methodology

I used a fine-tuned YOLOv11 model trained to detect players and the ball. The model was applied on a 15-second video.

I assigned IDs to players based on centroid positions in initial frames, and maintained the same IDs when players reappeared using simple Euclidean distance checks. The system simulates real-time re-identification and tracking in sports footage.

2. Techniques and Outcomes

- Used YOLOv11 object detection for player localization.
- Applied centroid-based feature tracking.
- Used Euclidean distance for re-identification.

Outcome: Successfully tracked multiple players over time even when they briefly left the frame.

3. Challenges Encountered

- Faced occasional false positives (e.g., detecting referees or non-players).
- Re-identifying players was difficult during occlusion or crowded scenes.
- Tracking accuracy was limited by relying only on spatial coordinates, without visual appearance cues.

4. Future Work

- Plan to integrate appearance-based embedding using Deep SORT or cosine similarity on cropped images.
- Want to generate a visual output showing player ID trails and annotated video.
- Aim to improve re-identification across occlusion and faster motion using optical flow or temporal prediction.