Brief Report

Objective

Track players across a 15-second video using a given YOLO model and maintain player identity through occlusion and re-entry.

Methodology

- Used YOLO for player detection in each frame.
- Initialized IDs during the first 3 seconds using spatial heuristics (IoU + centroid distance).
- Maintained identities using DeepSORT with MobileNet-based embeddings.
- Handled re-entry by matching appearance features and bounding box similarity to reassign original IDs.

Techniques Tried

- Initially used simple IoU-based tracking → failed when players were occluded or re-entered.
- Enhanced with appearance embedding comparison (via DeepSORT) for re-identification.
- Combined spatial and visual features for more robust tracking.

Challenges

- Re-identification after occlusion required stronger appearance features.
- Lack of unique jersey numbers/colors made matching ambiguous.
- Short video duration limited data for robust ID modeling.

Future Improvements

- Experiment with stronger Re-ID models like OSNet or FairMOT.
- Incorporate jersey color clustering or player pose estimation.
- Explore temporal attention or transformer-based tracking models.