Report: Player Re-ID (Single Camera)

1. What I Did

- **Detection:** We used a custom YOLOv11 model (`best.pt`) to find players and the ball in video frames.
- **Tracking:** We used DeepSORT to give each player an ID and keep it the same when they leave and come back.
- **Putting It Together:** In Google Colab, we:
    1. Installed the needed libraries.
    2. Uploaded our model and the 15-second video.
    3. Ran a loop that detects and tracks players frame by frame.
    4. Drew boxes and IDs on each frame and saved the result as `tracked_output.mp4`.

2. What I Tried

- **Resizing Frames:** We made frames 384×640 pixels so the model runs faster.
- **Tracker Settings:**
    - Kept “lost” players for 30 frames (`max_age=30`).
    - Confirmed new players after 3 detections (`n_init=3`).
    - Used a matching threshold of 0.4 for appearance.
- **Tweaks:** We also tried `max_age=50` and distance 0.3 to see if IDs stayed better.

3. Problems I Faced

- **Formatting Error:** At first, we sent the wrong format to DeepSORT and got a TypeError. We fixed it by sending a list for each box along with its score.
- **Speed:** Large frames were slow. Resizing helped a lot.
- **ID Mix-Ups:** When players overlapped, sometimes IDs switched. We might need a better re-ID model for that.

4. Next Steps

- **Option 1:** Try matching players across two camera views.
- **Better Re-ID:** Train a small network to recognize players by how they look.
- **Speedup:** Use model optimizations (like ONNX) to run even faster.

5. Viewing the Result

You can watch the final tracked video here: [Tracked Output on Drive]

Video demonstrates persistent player IDs across the 15-second clip.