Player Re-Identification using YOLOv8 and DeepSORT

Objective

To identify and track players in a 15-second video using:

- A custom-trained YOLOv8 model for player detection
- DeepSORT for re-identification and ID consistency

Approach and Methodology

1. YOLOv8 for Object Detection:
   - Used a fine-tuned YOLOv8 model to detect players.
   - Only detections of class '0' (players) were used.

2. DeepSORT for Tracking:
   - DeepSORT was used to maintain consistent tracking IDs for each player.
   - Even if a player exited and re-entered the frame, their ID was retained.

3. Integration:
   - YOLO detections were passed to DeepSORT with confidence scores.
   - Bounding boxes and IDs were drawn on the video output in real-time.

Techniques Tried and Outcomes

- YOLOv8 provided accurate detections in sports environments.
- DeepSORT maintained reliable tracking of individual players.
- Together, they produced a consistent and usable re-identification system for sports analytics.

Challenges Encountered

- Preventing the model from detecting and tracking the ball (non-player objects).
- Managing different Python versions and dependency compatibility.
- Ensuring video paths and formats were supported across platforms.
- Real-time frame processing and rendering with OpenCV.