📋 Player Re-Identification Project – Brief Report

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🧠 Project Goal

To track and re-identify players across video frames using real-time object detection and tracking methods.

🛠️ Methodology

1. Object Detection:

- Used **YOLOv8** for detecting players in each frame.
- Ultralytics API allows fast, accurate detection with pretrained weights.

2. Multi-Object Tracking:

- Used **Deep SORT** for real-time person tracking.
- Maintains ID across frames, even with temporary occlusions or movements.

3. Integration:

- Combined YOLO detections with Deep SORT tracker using bounding box info.
- Annotated each frame with bounding boxes and unique player IDs.

✅ Techniques Tried

Technique	Outcome
YOLOv8	Fast and accurate player detection

Technique	Outcome
Deep SORT	Effective ID retention for players
Output Video	Successfully saved as `reid_output.mp4`

⚠️ Challenges Faced

- **ID Swapping:** In fast movements, Deep SORT occasionally assigns wrong ID.
- **Installation Issues:** Some users faced `cv2` module errors due to incorrect pip usage.
- **Video Quality:** Low-quality videos reduced model accuracy.

🔧 Remaining / Future Work

If given more time and resources, I would:

- Train YOLOv8 on a custom dataset of player jerseys to improve identification accuracy.
- Integrate ReID networks for finer-grained player distinction (e.g., jersey numbers).
- Add GUI or Streamlit frontend for ease of use.
- Deploy on GPU for faster inference.

✅ Summary

The project successfully detects and re-identifies players in video using YOLOv8 + Deep SORT. Output is rendered as a video with bounding boxes and consistent IDs across frames.
