

Player Re-Identification using YOLOv8 + ByteTrack

Objective

The goal of this assignment was to build a system capable of assigning consistent IDs to players in a short sports video, even after they go out of frame and return. This reflects a real-world Re-ID challenge in sports analytics.

My Approach

- Used the provided best.pt (YOLOv8) model to detect players.
- Integrated ByteTrack, a high-performance multi-object tracker.
- Tuned the detection confidence and frame association thresholds.
- Replaced complex visual embedding-based matching with ByteTrack's efficient temporal tracking mechanism.

Pipeline

1. **Detection:** YOLOv8 identifies player bounding boxes in each frame.
2. **Tracking:** ByteTrack associates detections across frames using motion and spatial consistency.
3. **Re-ID:** Players are re-identified based on consistent visual-motion trajectories.

Testing & Results

- Tested on `15sec_input_720p.mp4`
- Output: `track.mp4` with bounding boxes and Player N labels
- Observed improved ID consistency compared to CLIP-based re-identification
- Latency: Real-time (25–30 FPS on GPU)

Challenges

- CLIP embeddings failed to generalize across frames due to jersey similarity
- Detection was biased toward brighter objects (e.g., goalkeeper)

- Addressed by switching to ByteTrack, improving multi-ID tracking stability

What's Next

- Cross-camera mapping (Task Option 1)
- Model-level improvements with vision-language embeddings
- Identity learning with jersey color clustering or pose

About Me

I'm Shreya, an AI enthusiast focused on computer vision and real-time ML systems. I'd be excited to build scalable Re-ID and vision models as part of the Liat.ai team!