CSE573 - Computer Vision and Image Processing

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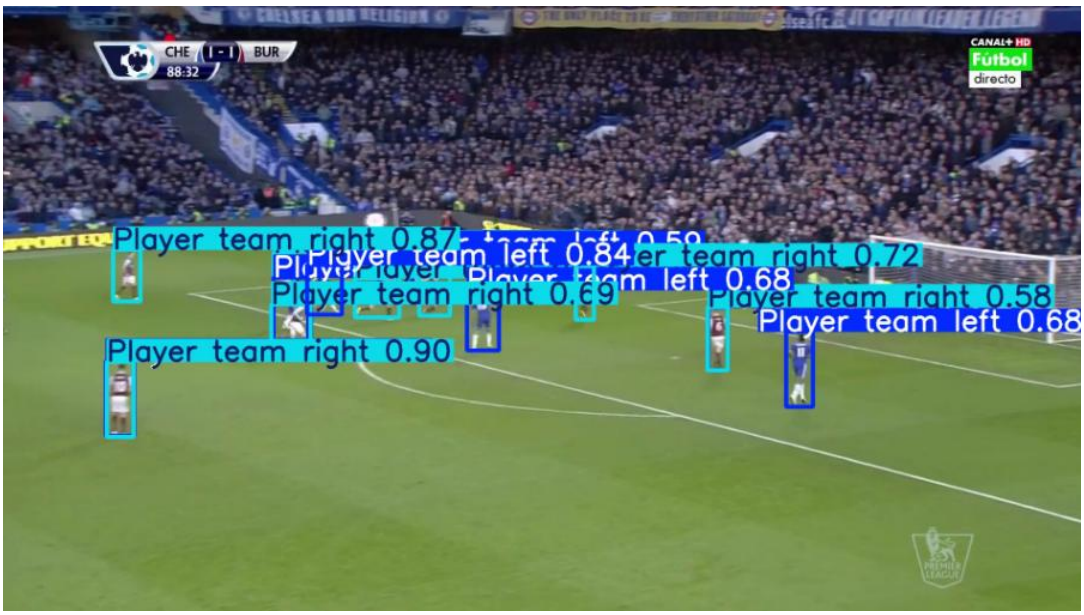
Progress Report #2

Progress to Date since Report #1

1. **Player Detection and Team Classification:**

- Fine-tuned YOLOv8 Nano (`yolov8n.pt`) on the SoccerNet-v3 dataset for player detection.
- Achieved successful detection of players in soccer frames with bounding boxes and confidence scores.
- Implemented team classification using HSV-based jersey color segmentation to distinguish between two teams ("Player team right" and "Player team left").
- Verified team classification results visually by overlaying bounding boxes with team labels on detected players.



Planned Tasks

1. Goal-Side Identification:
    - Implement logic to identify the defending team's goal side based on player positions or goalpost detection.
    - This step will help determine the second-to-last defender's position more accurately.
2. Offside Detection Logic:
    - Develop a rule-based system to determine offside violations based on FIFA regulations:
        - Identify the second-to-last defender's position.
        - Compare attacking players' positions relative to the defender.
3. Testing Pipeline:
    - Integrate all components (player detection, team classification, goal-side identification, perspective transformation, offside logic) into a single pipeline.
    - Test the pipeline on additional matches from SoccerNet-v3.
4. Performance Evaluation:
    - Measure precision, recall, and FPS for player detection, team classification, and offside decision-making.
    - Optimize code for real-time performance on consumer hardware.

Schedule Through Project Completion

Task	Start Date	End Date	Status
Dataset Preparation	March 13, 2025	March 17, 2025	Completed
Player Detection Fine-Tuning	March 18, 2025	March 23, 2025	Completed
Team Classification	March 25, 2025	March 27, 2025	Completed
Goal-Side Identification	March 28, 2025	April 1, 2025	Planned
Offside Detection Logic	April 5, 2025	April 8, 2025	Planned
Pipeline Integration	April 9, 2025	April 12, 2025	Planned