■ Cricket Batsman Stance Detection using MediaPipe Pose

This report presents an AI-based approach to automatically detect and classify a cricket batsman's stance (Left-Handed or Right-Handed) from video footage using **MediaPipe Pose**. The system analyses each frame of the input video, extracts body landmarks, applies heuristic geometric rules, and determines the batsman's stance in real time. The output includes labeled video, stance timeline plot, and per-frame CSV data.

■ Project Structure

SportzEngage/
■■■ data/net_session.mp4 – Input video
■■■ src/pipeline_mediapipe.py – Main Python script
■■■ CRICKET_ANALYSIS_RESULTS/
■ ■■■ batsman_stance.csv – Frame-wise stance
■ ■■■ batsman_labeled.mp4 – Video with stance overlay
■ ■■■ stance_plot.png – Stance consistency graph
■■■ README.md – Documentation

■■ System Workflow

1. Input video is loaded and cropped to a fixed Region of Interest (ROI) containing the batsman.
2. MediaPipe Pose detects 33 body keypoints (shoulders, wrists, hips, etc.).
3. Geometric logic determines batting stance:
   • If left wrist lower than right → Right-Handed
   • If right wrist lower than left → Left-Handed
4. A 15-frame smoothing window ensures consistent classification.
5. Final results (video, CSV, graph) are generated.

■ Stance Classification Logic

Condition	Interpretation
right_shoulder.x > left_shoulder.x	Right-Handed stance (shoulder forward)
left_wrist.y > right_wrist.y	Left hand lower → Right-Handed
right_wrist.y > left_wrist.y	Right hand lower → Left-Handed
Fallback	Default to Right-Handed

■ Results Summary

Video: net_session.mp4
Total Frames: 18,007
Detection Success Rate: 89.7%
Right-Handed: 88.2%
Left-Handed: 1.5%
Undetected: 10.3%
Final Verdict: ■ Right-Handed Batsman (High Confidence)

■ Why MediaPipe?

• Lightweight and runs in real-time on CPU
• No GPU dependency
• Robust for upper-body motion detection
• Easy integration with OpenCV for visualization

■ Future Improvements

• Integrate bat detection using YOLOv8
• Implement auto ROI tracking
• Generate PDF reports with key frames
• Web dashboard for interactive visualization (Streamlit)
• Multi-batsman detection and tracking

■■■ Author

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SportzEngage – AI-Powered Cricket Analytics
Built using Python 3.11, MediaPipe Pose, OpenCV, Matplotlib
“From raw video to professional batting insights – automatically.”