Smartan.AI - Computer Vision & AI Internship Task Document

Task Duration: 2 Days

Submission Deadline: 20th of June (Midnight)

Overview

This task is designed to assess your ability to use human pose estimation frameworks to analyze exercise form and correctness. It evaluates your understanding of body keypoint tracking, application of geometric and rule-based logic for posture analysis, and your ability to convert pose data into meaningful real-time feedback. The task emphasizes both technical implementation and your thought process in designing evaluation rules for common fitness movements.

You are required to complete the tasks within the 3-day duration.

Task 1: Form Correctness Detection Using Pose Estimation

Objective:

Build a form correctness detection pipeline using MediaPipe or OpenPose.

Problem Details:

- Use open-source data or self-recorded clips (3–5 seconds) for exercises (e.g., bicep curl, lateral raise).
- Detect keypoints and apply rule-based posture correctness logic.
- Include at least three posture rules (more rules are needed to be taken into consideration for accuracy), such as:
  - Elbow angle during bicep curl
  - Wrist-shoulder alignment during lateral raise
  - Symmetry or angle of back posture

Requirements:

- Use OpenPose or MediaPipe for keypoint detection.
- Extract time-series data and smooth if needed.
- Apply rule-based analysis.
- Provide frame-wise or window-based feedback.

Submission Must Include:

- Python code in a structured GitHub repository.
- Script for pose detection and form evaluation.
- Sample video with overlay showing real-time feedback.
- PDF or word file explaining:

- The posture rules used
- The logic behind the rules
- Any challenges faced (how will you handle multiple persons in the same video footage)

Submissions Will Be Rejected If:

- GitHub repo is private or incomplete.
- Key deliverables (code, video, documentation) are missing.
- Plagiarism is found.
- Submission is late without prior approval.

Good luck!
For queries, feel free to reach out before your deadline.

-- Team Smartan.AI