YOGA POSE DETECTION MODEL

DOCUMENTATION FOR COMPLETE IMPLEMENTATION OF THE PROJECT

1. Installing the dependencies

- pip install qtpy
- pip install mediapipe
- pip install opencv-python-headless
- pip install opencv-python

2. Importing the necessary libraries

- import math
- import cv2
- import numpy as np
- from time import time
- import mediapipe as mp
- import matplotlib.pyplot as plt

3. Pose Detection on a sample image

Pose detection on a sample image ‘yoga pose.jpeg’ using **mp_pose.PoseLandmark** to observe any 5 different landmarks.
Thereafter, we convert the 5 normalised landmarks into their original scale.

4. Drawing Landmarks on the sample image

Drawing the landmarks on the sample image using **mp_drawing.draw_landmarks.**
Displaying the images using **Matplotlib.**

5. Implementing the detect_pose() function:

Input:
image: The input image with a person whose pose landmarks needs to be detected.
pose: The pose setup function required to perform the pose detection.
display: A boolean value that is if set to true displays the original input image, the resultant image, and the pose landmarks in 3D plot
Returns:
output_image: The input image with the detected pose landmarks drawn.
landmarks: A list of detected landmarks converted into their original scale.

6. Real-Time Pose Detection with Webcam

We set up the pose function for video input and initialise the webcam. The frame rate is calculated and displayed on each frame.

7. Calculating Joint Angles

We define a function `calculateAngle()` to calculate the angles between three points (landmarks).

8. Classifying Yoga Poses

We define functions to classify specific yoga poses based on the calculated angles of various body joints.

6 yoga poses classified are-

- Warrior II Pose
- T Pose
- Tree Pose
- Plank Pose
- Downward Dog Pose
- Chair Pose

9. Yoga Pose Recognition in Real-Time

We calculate all the required angles for the joints using `calculateAngle()` . Following that we integrate the pose detection and pose classification functions to recognize yoga poses in real-time using the webcam.