INSTRUCTION DOC

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Python version used 3.8.15

Libraries used: numpy, opencv, mediapipe

: (pip install mediapipe opencv-python numpy)

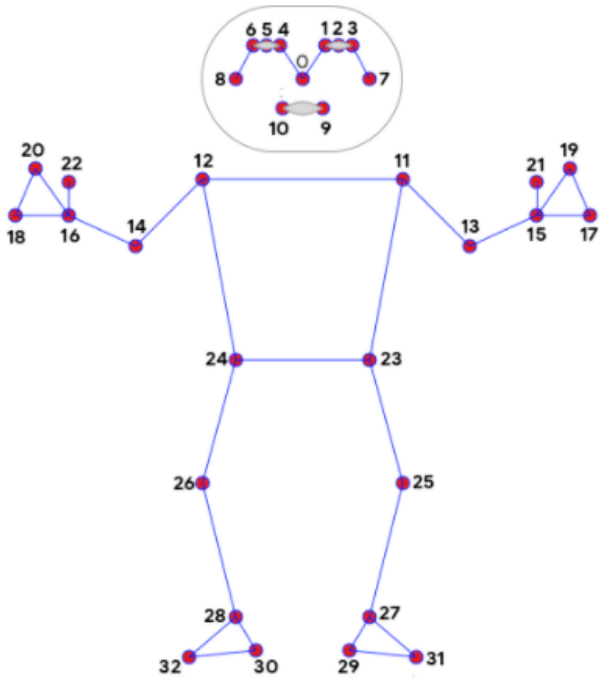
Formula used for Stat of Bendness(SOB):

Used a linear function that maps the range of values from 30 to 140 to the range of 0 to 1 can be represented by the following formula:

$$SOB = (x - 30) / (140 - 30)$$

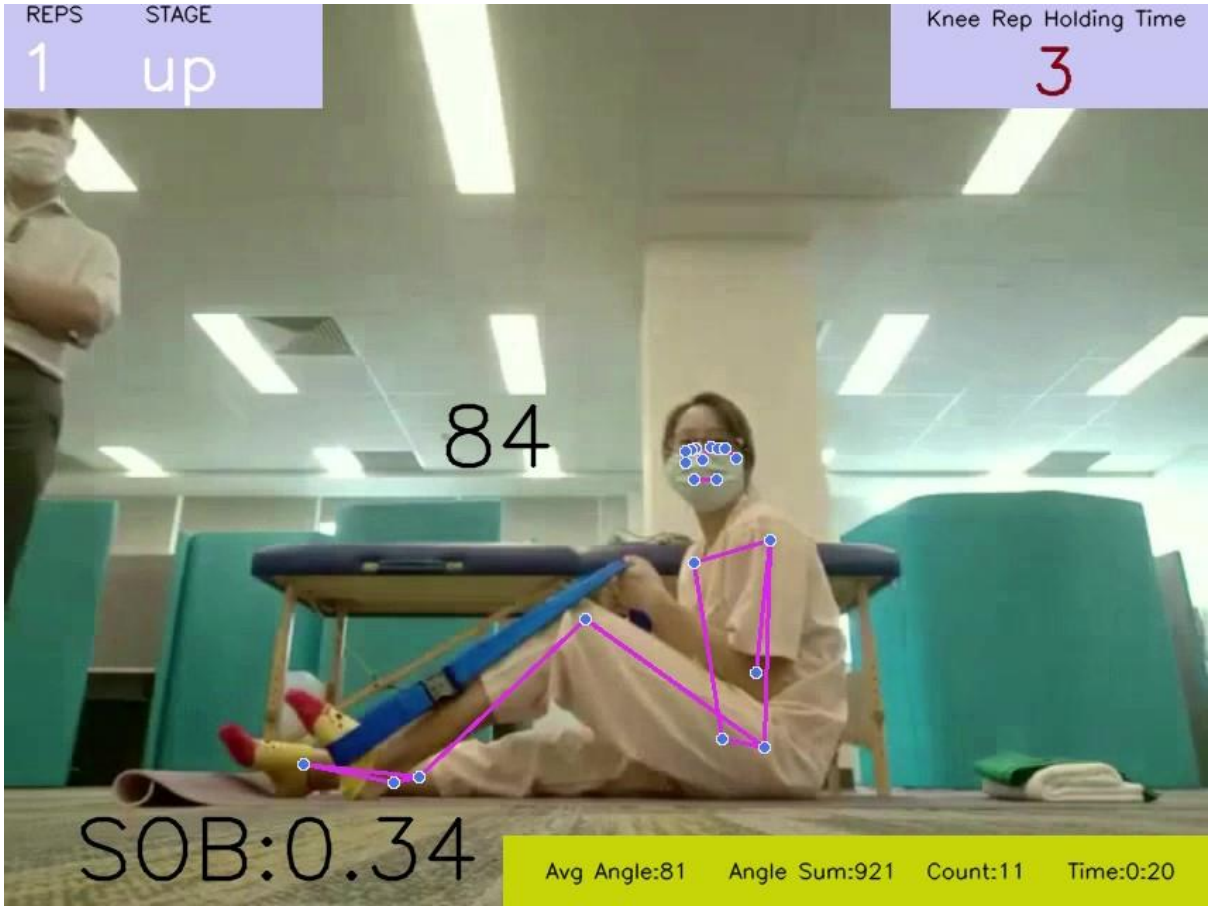
where x is the average rep angle.

Assuming 30 is the minimum achievable rep angle, and maximum allowed angle is 140.



0. nose
1. left_eye_inner
2. left_eye
3. left_eye_outer
4. right_eye_inner
5. right_eye
6. right_eye_outer
7. left_ear
8. right_ear
9. mouth_left
10. mouth_right
11. left_shoulder
12. right_shoulder
13. left_elbow
14. right_elbow
15. left_wrist
16. right_wrist
17. left_pinky
18. right_pinky
19. left_index
20. right_index
21. left_thumb
22. right_thumb
23. left_hip
24. right_hip
25. left_knee
26. right_knee
27. left_ankle
28. right_ankle
29. left_heel
30. right_heel
31. left_foot_index
32. right_foot_index

Used the angle between left_hip, left_knee and left_ankle to determine the rep angle, which are derived using the joint mapping provided by mediapipe model.



The top left indicates no of reps successfully completed, stage indicates is knee up or down to determine is the rep currently going on is she in the rest state.

The **top right** indicates the current time of the rep(3 sec), A rep is deemed successful if the knee holding timer goes above 8 seconds and comes to rest.

The **bottom left SOB** indicates the stat of bendness of the rep using the above-mentioned formula.

The **bottom right** indicates the Average angle for half the second time period (to take care of the fluctuations), Sum of angles in half a second and no of frames counted in that half of second as count. Time determines the total time elapsed in the video.

I also showed the real time hip-knee-ankle angle over the knee of the person, so that it is easy to visualize the angle.

I predicted the landmarks of joints and connections using a model complexity of 2 using mediapipe, and detection and tracking confidence as 0.5.