



# POSTURE DETECTION AND GYM TRACKER

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**Abstract :** Everyone benefits from exercise and physical activity. Staying active can benefit you in a variety of ways, regardless of your health or physical abilities. In reality, research shows that “taking it easy” is dangerous. Exercises are often practiced in training centers, through personal tutors, and may also be learned on one’s own with the help of the recorded clips, etc. In fast-paced lifestyles, many people prefer self-learning because the above-mentioned resources might not be available all the time. But in self-learning, one may not find an incorrect pose. One's health might suffer from improper posture, which can cause both short-term acute discomfort and long-term chronic problems. We investigated many applications that can be implemented using data provided by a pre-trained posture estimation model called MediaPipe. The user is then notified of his/her error in the posture through a display screen or a wireless speaker. The inaccurate body pose of the user can be pointed out in real-time so that the user can rectify his/her mistakes.

**Keywords —** Pose Estimation Model, Deep Learning, Mediapipe, OpenCV, Python.

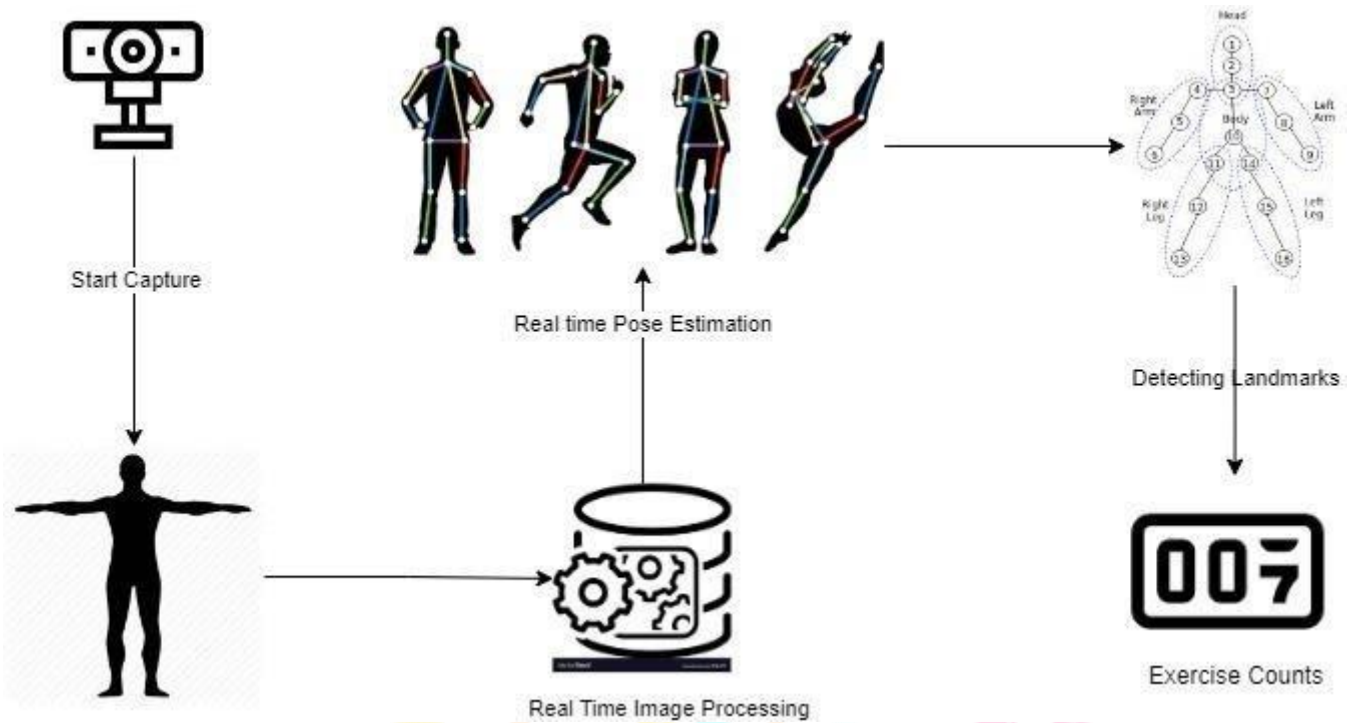
## I. INTRODUCTION

Out of our world’s population, around 39 % of adults are overweight. This shows how exercising is important in daily life. Exercise not only helps to reduce the body weight, but also if done regularly helps us stay active with good blood circulation and also to maintain a healthy weight, fit body and a peaceful mind. To maintain a fit and healthy body just like the way you used to go to gyms. Lifting weights is a great way to develop muscles, protect bones, burn calories, and stay fit. Maybe some people don’t know where to start or how to perform the exercises. You might be tempted to simply repeat the exercises as others do them, but this could lead to incorrect results. Another option is self-training which will have the steps to do the exercise routine which is pre-recorded but lacks feedback.

Without proper feedback about our postures, injuries can happen and it will do more harm than good. By using human pose estimation techniques, we could determine the position of a human being at key points. By doing so, we would be able to gauge or assess the pose of the human body and provide commentary on it. And a variety of methods have been used to accurately and effectively recognize the human position in real-time. With increasing computing power deep learning models have vastly improved and are the most used approach for body pose estimation.

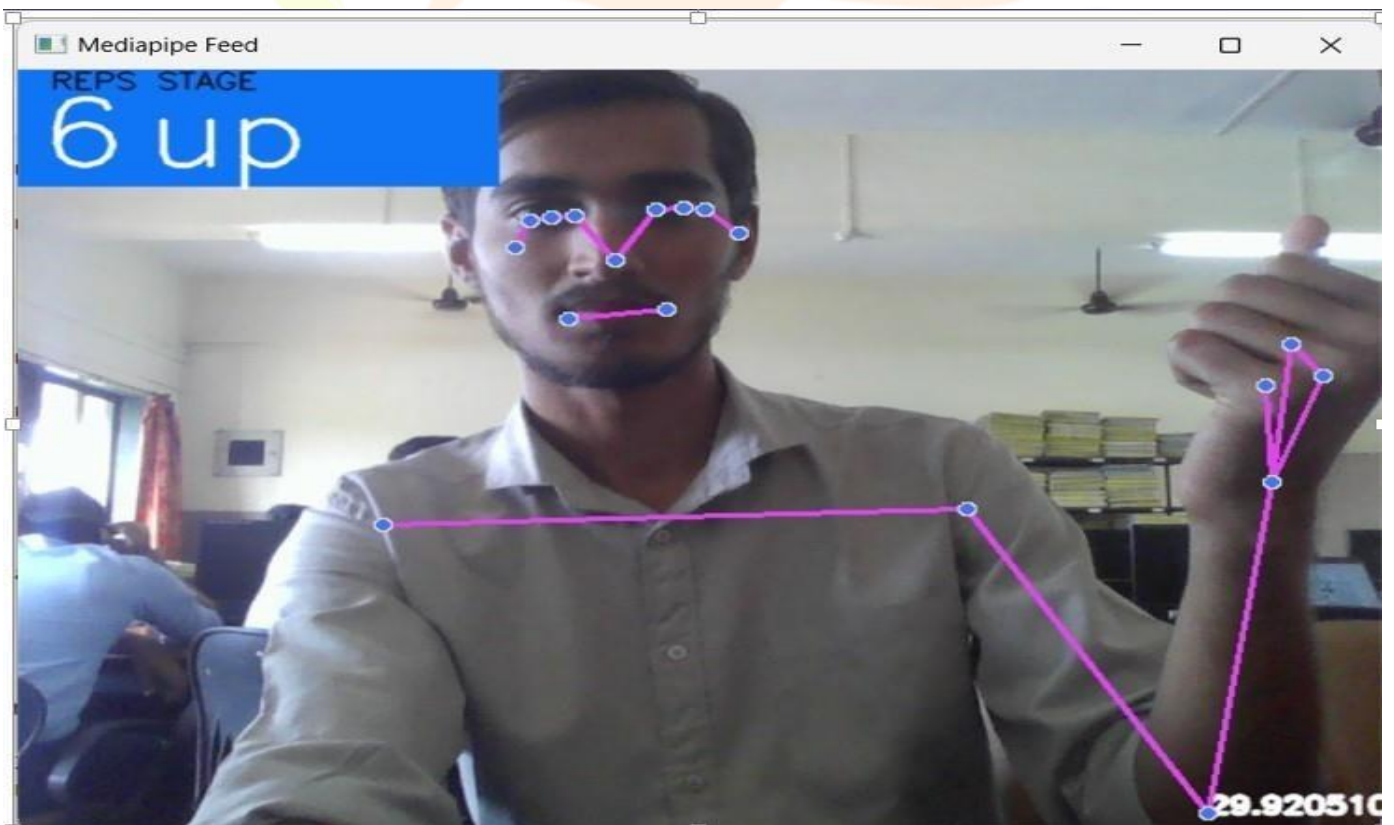
## II. RESEARCH METHODOLOGY

Posture detection is the process of analyzing and interpreting the position of the human body in space, with the aim of identifying incorrect posture and suggesting corrective measures. In this task, we can use computer vision techniques to process images or videos of human subjects and analyze their posture. Next, a pose estimation model is used to detect the key points of the human body in each image or frame of the video. The key points are then analyzed to determine the posture of the subject using a posture analysis algorithm. If an incorrect posture is detected, an alert mechanism is activated to notify the subject to correct their posture.



### III. IMPLEMENTATION

We have implemented a system which detects the posture of the user. It also detects the joint and angles of the person. The system helps the user while doing Gym activities. It monitors the user and detects the count of the following exercise by displaying the count on the screen. If the user is not performing the following exercise correctly, then it will not consider the following count.



## IV. RESULTS AND DISCUSSION

The program has successfully run and has calculated the angle of the model. It's able to detect the joints accurately and calculate the angle and make the user aware of inaccurate range of motion and concise feedback in real time that helps them for improvement in their workouts.

## V. CONCLUSION AND FUTURE WORK

We focused specifically on applications in areas of human development and performance optimization. Human pose estimation is an important problem in computer vision, which is being able to track a person's every small movement and do a biomechanical analysis in real-time. This helps the gym practitioner to learn self without assistance from a coach to make this system more robust.

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