

REAL-TIME YOGA POSTURE PREDICTION AND CORRECTION



Project guide:

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INTRODUCTION



BENEFITS OF YOGA

- Yoga improves flexibility.
- Yoga helps with stress relief
- Yoga improves mental health
- Yoga will likely increase your strength
- Yoga may reduce anxiety

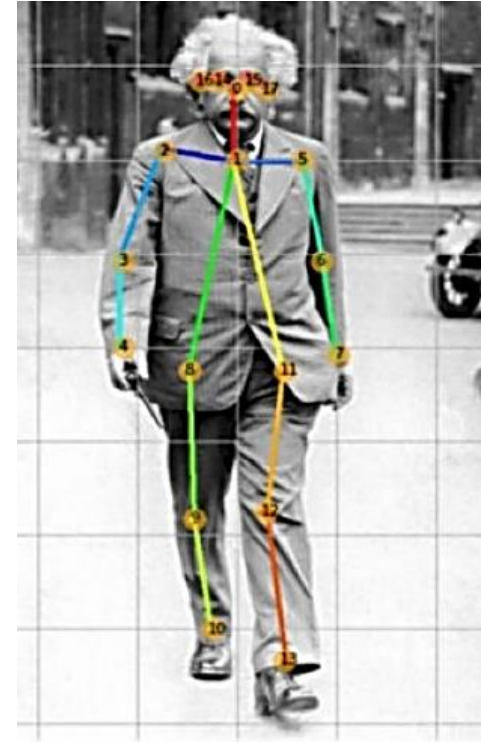
“

Yoga is essentially a spiritual discipline based on an extremely subtle science, which focuses on bringing harmony between mind and body.”



INTRODUCTION

- Incorrect posture while performing yoga can lead to serious harm to muscles and ligaments of the body.
- Our approach aims to automatically recognize the user's Yoga poses in real-time and provide concise feedback to the practitioner.
- Mediapipe algorithm extracts body landmarks of each of the key points to enable angle calculation of each body joint.
- So that proper instructions can be delivered to help them in a very convenient manner so that they can adjust their poses and learn about their incorrectness in real-time.



MODULES



1

Registration and selecting a pose

2

Pose Estimation

3

Pose Comparison

4

Pose Classification

5

Feedback

1. Registration and Selecting Pose

- We need to register an account and login into the webpage.
- Checking credentials, we will be moving to a page with 6 yoga poses mentioned.
- Select any pose to try and perform.
- Webcam will be opened as a result and can perform in front of it.

2. Pose Estimation

- Media Pipe is a framework for high-fidelity body pose tracking.
- It takes input from RGB video frames and infers **33 3D landmarks** on the whole human.
- Mediapipe algorithm extracts body landmarks of each of the keypoints to enable angle calculation of each body joint.



MediaPipe

3. Pose Comparison

- The output from the MediaPipe library only contains the coordinates of the user's major key points in the image.
- A function is written in the program to get these coordinates data and then calculate the angles at each joint.
- Given three key-points we can easily calculate the angle made between the two lines using analytic geometry.

4. Pose Classification

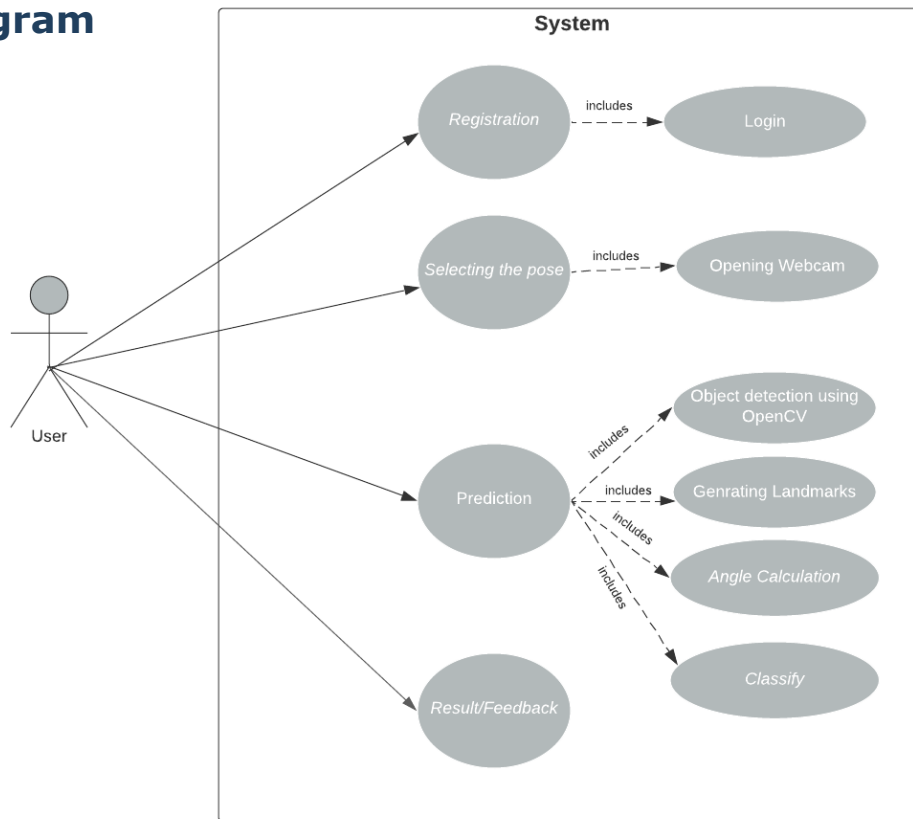
- A function is created, that will be capable of classifying different yoga poses using the calculated angles of various joints.
- For Eg., In **T Pose**, the person has to stand up like a tree with both hands wide open as branches.
 - Around 180° at both elbows
 - Around 90° angle at both shoulders
 - Around 180° angle at both knees

5. Feedback

- Giving feedback to the user is of utmost importance so that the user knows what he/she is doing wrong.
- When the user deviates beyond the threshold value the user is notified.
- Users can observe the correction and make necessary adjustments to his/her pose to accurately practice the yoga routine.
- The feedback can be in the form of a visual alert on the screen.

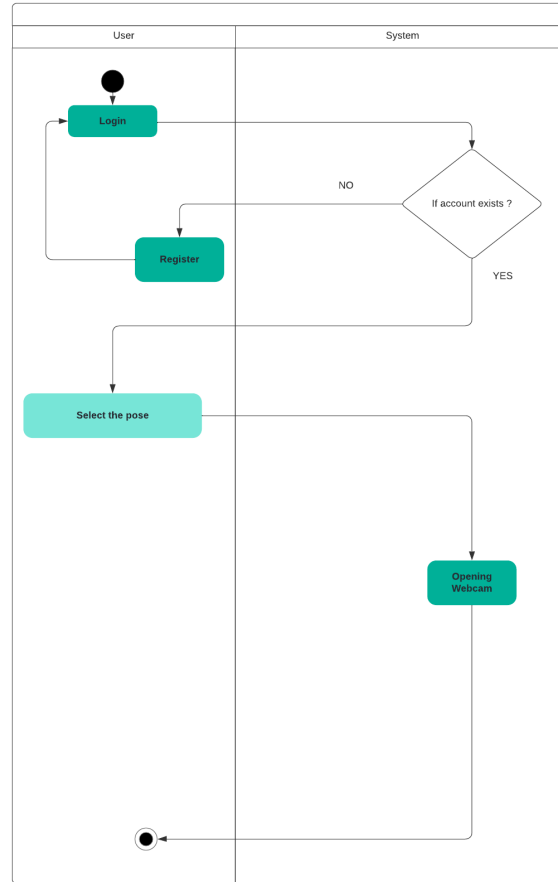
ARCHITECTURE DIAGRAMS

1. Use Case Diagram



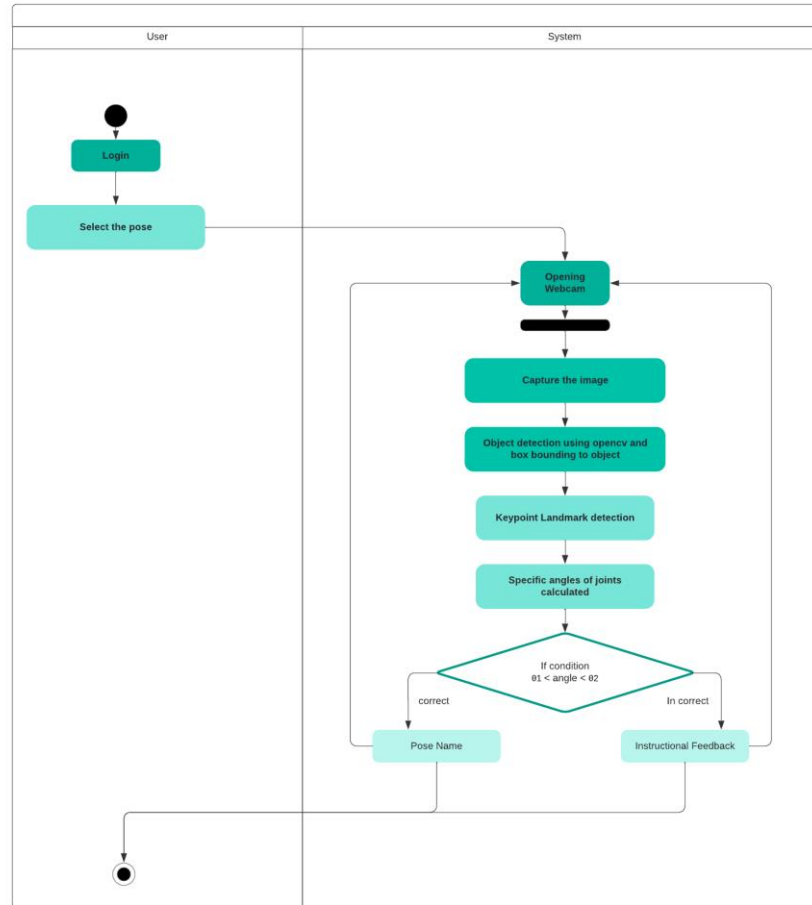
2. Activity Diagram

i: Registration



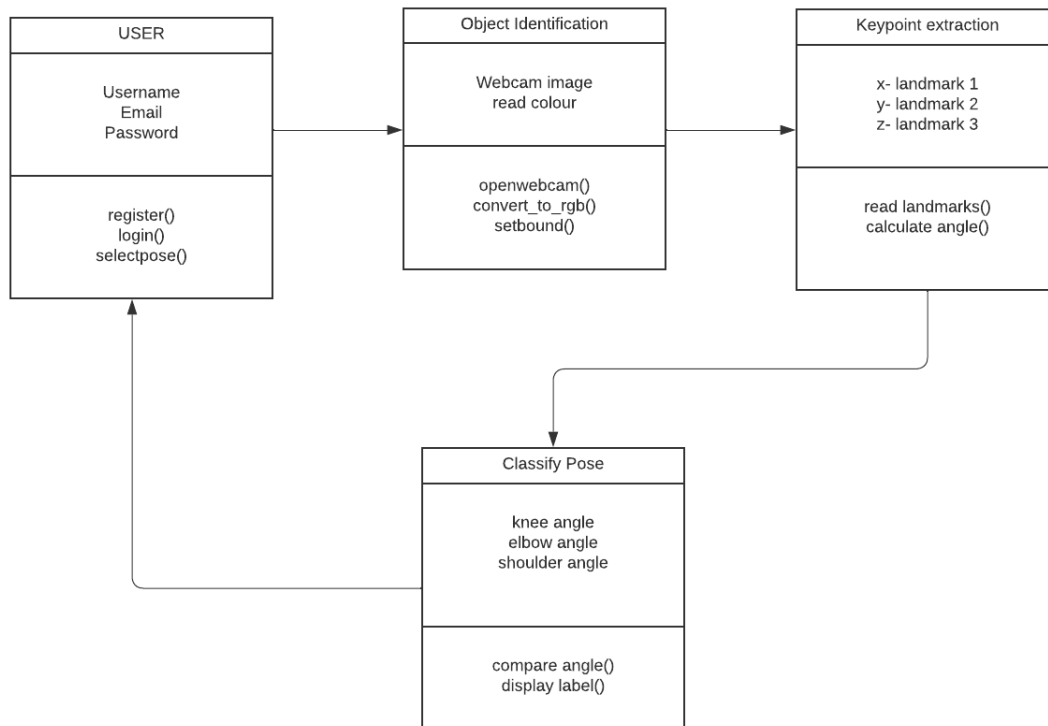
2. Activity Diagram

ii: Prediction



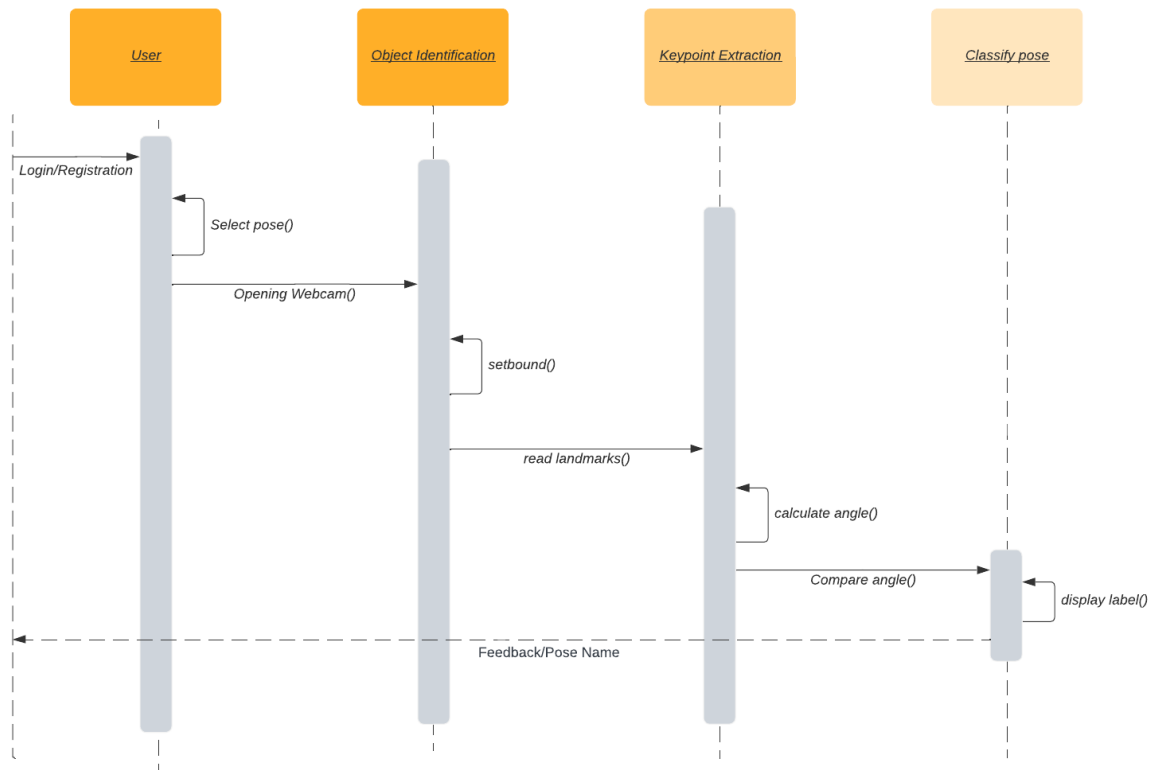
ARCHITECTURE DIAGRAMS

3. Class Diagram



ARCHITECTURE DIAGRAMS

4. Sequence Diagram



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THANK YOU