Personalize Healthcare Assistant

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ABSTRACT: Now a day, Health has become the major issue across the globe. We need to do different physical exercises and activities to keep up ourselves healthy. Everyone is not interested in joining the gym and different training workshops instead of that they find it easy to do it by themselves. For everyone who wants to do the exercises on their own they may require some guidelines to do it in correct manner without causing any troubles. So we are introducing our software for guiding people to do their exercise on their own. It is an AI based software (assistant) which guides people in real time.
We will be using CNN (Convolutional neural network) algorithm and also we will be using PoseNet to detect and match the poses of user. To guide the user we will be using the text- to -speech convertor.
  It uses a machine learning model called PoseNet to detect human poses and overlays skeleton stick figure on top .We will be retrain Posenet on labeled Yoga poses images so it would detect when a person correctly perform a certain pose, Then we will use speech generation to have the web based app guide your actions from pose to pose, just as a real yoga instructor would do.The goal is to help a user to reduce stress, anxiety and depression through a series of guide meditative poses.
Keywords: CNN algorithm, PoseNet model, Web Camera, Intel i9 Processor, Graphics Card.

I.   INTRODUCTION
1.1 Background
Now a days every work is done by the mobiles and Laptops. In every field the work mobiles and laptops are used very well. Students are learning through it, employees are working through it. What if these mobiles and laptops are used to do exercise?

This is our idea for this project. The software on the laptop will guide people to do exercise in real time.

The idea of this project is the combination of Artificial Intelligence and 3D pose estimation. The proposed work for this idea has done up to the pose detection using the point detection techniques from PoseNet .It is done by the [1] Changhyun Choi and Henrik I Christensen in paper "3D Pose Estimation of Daily Objects Using an RGB-D Camera". We are going to do this project for every single person so for this we took reference of paper published by RaduBogdanRusu named "Semantic 3D Object Maps for Everyday Manipulation in Human Living Environments". In this paper the [2] information about the human pose detection is given in brief. The proposed the work is until the 3d pose estimation only so from there we are going to take it over.

In our project the user first have to register and login. After login the user have to do a pose then the webcam will capture the real time images and process it. If the pose gets matched with the trained data user can proceed for next pose. Until the pose matches the software will guide the user.

1.2 Motivation
In the era of modern world everyone is using mobile phones and laptops to do all the works from home or where they are. Now life is so fast so, everyone is very busy in their life .But in this busy life we cannot ignore our health. Our health must be our first priority. So to keep ourselves healthy we have to do exercise. But in this fast life everyone is not able to join the gym to do proper exercise under guidance. What if a person can get a yoga instructor on his/her laptop so that he/she can maintain their health on their own. For this purpose we are developing this project.

In our project we are using 3D pose estimation and Artificial Intelligence to work it on real time. Here first user have to register and then he/she can login into the project. For the registration and login user have to provide email

address as a username and have to create a password. User cannot enter into the project without login, so login is necessary. After login user reaches to the dashboard from where the main project starts. On Dashboard the real time images of the user will be captured through the webcam. The captured images and trained data will be compared. If it matches the pose is correct and user can proceed for next pose.

The software uses PoseNet[1] to detect human poses and text-to-speech engine to speak to with the user . This emulates the role of the yoga instructor. It uses machine learning model called PoseNet to detect human poses and overlay a skeleton figure on top[2]. The goal is to help user to reduce the stress, anxiety and depression through a series of a guide meditative poses.

1.3 Objective
1. Now life is so fast so, everyone is very busy in their life .But in this busy life we cannot ignore our health. Our health must be our first priority. So to keep ourselves healthy we have to do exercise. In short to help the user to maintain their health on their own.
2. To help the user to deal with the stress, anxiety, depression, etc. using different yoga poses. To do Yoga a person require proper knowledge. This software guides user to do Yoga in proper manner.
3. Today's life is very fast and people are becoming very busy. People avoids to join the the gyms, training centers due to the time which is being wasted on travelling. So they can reduce the time and money of user which he/she will spend in the gym and travelling by using this software.
4. User can get his/her personal yoga trainer (Assistant) with them at anywhere and anytime. As laptops are portable user can do Yoga at their suitable place. There is no restriction of time and place.

II. LITERATURE REVIEW
The idea of this project is using the combination of Artificial Intelligence and 3D pose estimation. The proposed work for this idea has done up to the pose detection using the point detection techniques from PoseNet .It is done by the [1] Changhyun Choi and Henrik I Christensen in paper "3D Pose Estimation of Daily Objects Using an RGB-D Camera". We are going to do this project for every single person so for this we took reference of paper published by RaduBogdanRusu named "Semantic 3D Object Maps for Everyday Manipulation in Human Living Environments". In

this paper the [2] information about the human pose detection is given in brief. The proposed the work is until the 3d pose estimation only so from there we are going to take it over.

In this project we are going to use CNN[3] model for further work in machine learning. Following are the steps in CNN algorithm.

1. Dataset preparation and preprocessing
Data is the foundation for any machine learning project. The second stage of project implementation is complex and involves data collection, selection, preprocessing, and transformation. Each of these phases can be split into several steps.

1.1 Data collection
Collecting relevant and comprehensive data, interpreting it, and analyzing results with the help of statistical techniques.

1.2 Labeling
An algorithm must be shown which target answers or attributes to look for. Mapping these target attributes in a dataset is called labeling.

1.3 Data preprocessing
The purpose of preprocessing is to convert raw data into a form that fits machine learning.
1.4 Data transformation
In this final preprocessing phase, a data scientist transforms or consolidates data into a form appropriate for mining (creating algorithms to get insights from data) or machine learning.

2.Dataset Splitting
2.1 Training set
A training set to train a model and define its optimal parameters it has to learn from data.

3.Modeling
3.1 Model training
An algorithm will process data and output a model that is able to find a target value (attribute) in new data — an answer you want to get with predictive analysis. The purpose of model training is to develop a model.

4.Model deployment
The model deployment stage covers putting a model into production use.

III. DESIGN
Data Flow Diagram
As shown on the below data flow diagram(fig. a) the start of the project will be from

entering into the webpage of login. Here if user is new he/she have to first register and then they can login into the software. The registered user can directly go to the login. After login the Dashboard appears from where capturing images starts. Then the feature extraction and feature matching will be done with the help of PoseNet. If the Features of the captured image is matched with the trained data set then it will go for next yoga pose .Otherwise assistant will guide you until the features of the captured image get match.
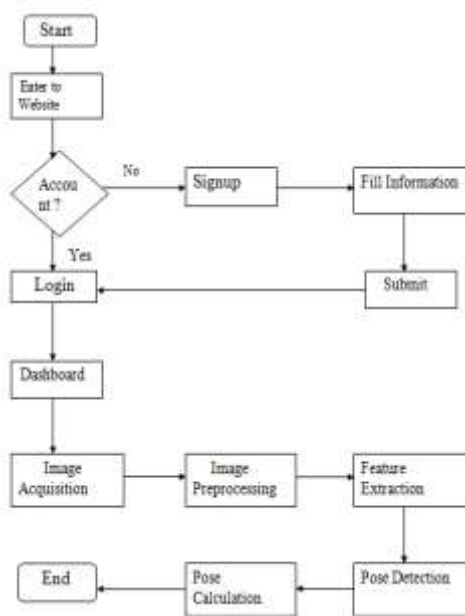

Fig. (b). Member login page

Fig. (a). Data Flow Diagram

Output

Fig. (b). Registration page

Fig. (c). Model loading

Fig. (d). Pose detection

Fig. (e). Pose match

Scope

This project involves the creation of the web-based application. The user interface is designed in such a way that the user have to login to access the application. The user have to do a pose whose real time images will be captured by

webcam. The features of the captured images will be calculated and they are compared with the trained data set .If the features matched then pose is correct. If the user fails to do the proper pose the application will guide user. After the proper pose of Yoga the user can proceed to the next pose. After the completion of Yoga the course will be completed.

IV. CONCLUSION

In this modern era health has become major issue. People are spending huge amount of money and time to maintain their health. Everyone is busy now days so everyone is not ready to go to the gym and attained different workshop. For solving this problem we have found a solution i.e. Personalize Healthcare Assistant.

In this application we are using combination of machine learning and artificial intelligence. In the machine learning we are using 3D Pose estimation (PoseNet) and assistant for guidance using artificial intelligence. This application is going to guide user for the different yoga position he/she is going to perform. Assistant will guide user using text-to-speech convertor.

User can access an application using e-mail address and password. First step is to get register yourself from their user will get password and username (e-mail address).After successful login user will get dashboard where the real time images will be captured by webcam. The features of the captured images are compared to trained data set. The features of image are captured by the PoseNet. If the features gets matched then the pose is matched. Then user can proceed for next pose.

REFERENCE

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