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REVIEW ON HUMAN POSE ESTIMATION FOR PHYSICAL TRAINERS

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Abstract: Human pose estimation localizes body key points to accurately recognizing the postures of people given a picture. This step may be a crucial prerequisite to multiple tasks of computer vision which include human activity recognition, human tracking, human-computer interaction, gaming, sign languages, and video surveillance. A deep structure which might represent a man's body in several models will help in improved recognition of body parts and also the spatial correlation between them. For hand detection, features supported hand shape and representation of geometrical details are derived with the assistance of hand contour. An adaptive and unsupervised approach supported region is primarily used for the colour image segmentation problem. This process includes identification of key points of the body, which can include body joints and parts. The identification parts are tough thanks to small joints.We propose a system which will hep Detect human pose .

Index Terms **- Pose Estimation, Machine learning, Key points**

I. INTRODUCTION

Pose estimation is a computer vision technique to trace the movements of an individual or an object. this is often commonly performed by uncovering the situation of key points for the given objects. supported these key points we will study various movements and postures and draw insights.The performance of semantic key point tracking in live video footage requires high computational resources what has been restricting the standard of pose estimation. With the most recent advances, new applications with real-time requirements become possible, like self-driving cars and last-mile transportation robots.2D human pose estimation is employed to estimate the 2D position or spatial location of build key points from visuals like images and videos. Traditional 2D human pose estimation methods use different hand-crafted feature extraction method for the individual body parts. There are three of the foremost utilized varieties of figure models: skeleton-based model, contour-based, and volume-based.

Using Pose Estimation for Physical Trainers will follow following steps:

1. Capture user's movements while doing an exercise
2. Analyze exercise
3. Keep Count

The proposed system will make use of Blaze Pose for detecting the human pose.The proposed system will take images of exercise and extract key points from them.The extracted key points will be saved CSV file.These key points will be used to determine The key points from the images captured.Blaze pose model requires RGB images.Once the key points are added then a label will be set for the image to indicate type of exercise.The CSV file will be used to train the model.A Sequential model will be trained for final result. The system will capture image of the user to identify the pose.The captured image will the be processed for further use.The key points from the image will be extracted and saved in csv file.The extracted key points will be classified using a machine learning algorithm.

II. LITERATURE SURVEY

Author of [1] estimate and track articulated human poses in sequences from a single view, real-time range sensor.The system make use of bottom up detectors that generate candidate head, hand and forearm locations. Quantitative performance evaluation using hand annotated data is done.The paper concludes that use this method in a calibration phase on the initial frames before processing using our pose estimation system.In [2] author mentions unifified framework for human pose estimation.UniPose-LSTM is used for multi-frame processing and achieves state-of-the-art results for temporal pose estimation in Video.The results show that UniPose, with a ResNet is a robust and effificient architecture for pose estimation obtaining state-of-the-art results in single person pose detection for both single images and videos.Author introduce a novel benchmark "MPII Human Pose" that makes a signifificant advance in terms of diversity and diffificulty, for future developments in human body models in [3].The collected images cover a wider variety of human activities than previous datasets including various recreational, occupational and householding activities, and capture people from a wider range of viewpoint.A rich set of labels including positions of body joints, full 3D torso and head orientation, occlusion labels for joints and body parts, and activity labels are provided.

Author of [4] discusses the issues in human pose estimation and gives the overview of considerable research work in pose estimation, including deep learning approach and customary image-based techniques. After analyzing several results and detecting the restrictions, the author has reconstructed a simple model using convolutional neural network that estimates the poses and demonstrates the potential of CNN's.The author concludes with a few promising bearings and directions that have to be explored for future research. A survey is documented in [5].The survey is presented as a baseline for newcomers and guides researchers to discover new models by observing the procedure and architecture flaws of existing researches. A brief introduction of single person and multi person pose estimation is provided.Approached used in human pose estimation are also discussed.

III. PROPOSED SYSTEM

Human pose estimation localizes body key points to accurately recognizing the postures of people given a picture.Machine Learning algorithms can be broadly classified in three categories-classification algorithms,regression algorithms and clustering algorithms.The proposed system makes use of human pose estimation model for identifying key-points of the human pose.the system also makes use of a sequential machine learning model to predict the pose of the human.The proposed system will make use of Blaze Pose for detecting the human pose.The proposed system will take images of exercise and extract key points from them.The extracted key points will be saved CSV file.These key points will be used to determine The key points from the images captured.Blaze pose model requires RGB images.Once the key points are added then a label will be set for the image to indicate type of exercise.The CSV file will be used to train the model.A Sequential model will be trained for final result. The system will capture image of the user to identify the pose.The captured image will the be processed for further use.The key points from the image will be extracted and saved in csv file.The extracted key points will be classified using a machine learning algorithm.The system architecture of proposed system is shown in Fig-1below.

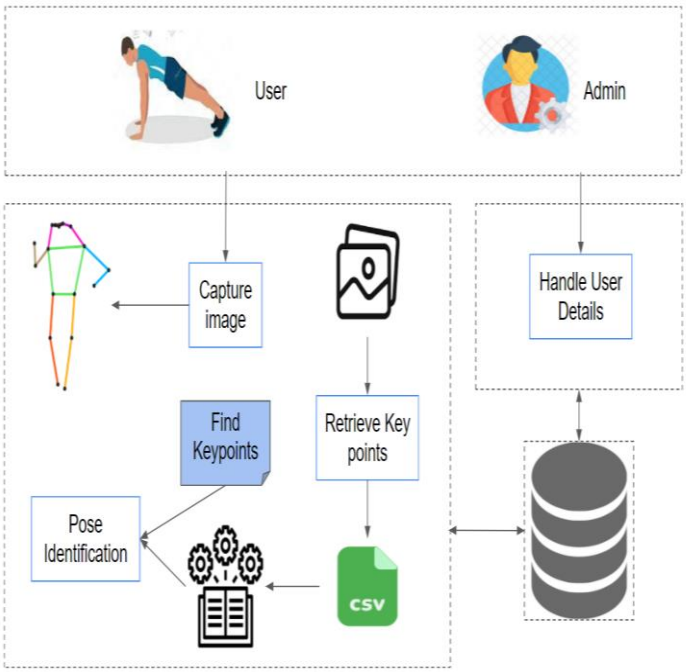

Fig 1:System architecture

Proposed system will have two users.Admin to handle permissions and user of the system.Proposed system is a computer vision project.It involves two major parts one is machine learning model training and second is actual estimation of the pose.The first part consist of using data set to train a model.The data set consist of images divided in training and testing images.Key points from these images is extracted and saved in csv file.A label is added for each images.This csv file will then be used for training process.The second part involves capturing image of the user.Determining pose using ML model.

IV. CONCLUSION

The Human Pose Estimation for Physical Trainers can prove beneficial in system where exercise and yoga poses need to checked by virtual trainers.It can help user to identify human pose.the system will be implemented using machine learning model for pose classification.

REFERENCES

[1] Matheen Siddiqui and G´erard Medioni, Human Pose Estimation from a Single View Point, Real-Time Range Sensor,978-1-4244-7030-3/10 2010 IEEE

[2] Bruno Artacho, Andreas Savakis ,UniPose: Unifified Human Pose Estimation in Single Images and Videos,2020 IEEE/CVF Conference on Computer Vision and Pattern Recognition

[3] Mykhaylo Andriluka, Leonid Pishchulin, Peter Gehler, and Bernt Schiele,2D Human Pose Estimation: New Benchmark and State of the Art Analysis,2014 IEEE Conference on Computer Vision and Pattern Recognition

[4] Anubhav Singh, Shruti Agarwal, Preeti Nagrath, Anmol Saxena, Narina Thakur,Human Pose Estimation Using Convolutional Neural Networks,978-1-5386-9346-9/19 2019 IEEE

[5] Tewodros Legesse Munea, Yalew Zelalem Jembre , Halefom Tekle Weldegebriel, Longbiao Chen, Chenxi Huang, and Chenhui Yang ,The Progress of Human Pose Estimation: A Survey and Taxonomy of Models Applied in 2D Human Pose Estimation ,10.1109/ACCESS.2020.3010248, IEEE Access