Live Yoga Pose Classification Using Image Processing, Deep Learning and LR Algorithm

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Abstract - *An approach to accurately acknowledge various Yoga pose Assess deep learning algorithms has been presented during this work. During system, our purpose to access a Yoga pose assessment technique using pose detection to assist the self-learning of Yoga. The system first detects a Yoga pose using multi human joint parts detection only with laptop camera. During this system, we have a tendency to additionally propose AN improved formula to calculate scores which will of all poses. Our application is evaluated on completely different Yoga poses. A hybrid Machine learning model is proposed using linear Regression algorithm for Yoga recognition on real-time videos, where Linear regression is used to extract features from key-points of each frame obtained from Open-Pose.*
Keywords: - Linear Regression, Machine Learning, Yoga Pose detection etc.

INTRODUCTION

Project Scope

It is accustomed bring harmony to each body and mind with the help of posture, meditation and varied alternative respiration techniques It bring peace to the mind. Due to increase of stress in the modern lifestyle, yoga has become popular throughout the world. There are various ways through which one can learn yoga. Yoga is learnt by attending categories at a yoga center or through home tutoring. It also can be self-learnt with the assistance of books and videos. Most people prefer self-learning but it is hard for them to find correct parts of their yoga poses by themselves.

Objective

LR algorithm is used in order to identify and fix a person's yoga pose. To extract from the photos the Open Pose (a pre-trained model) key points of the human joint locations, after which the deep learning model is trained using these key points. To determine if a person is performing a yoga pose correctly or not, we want to build a special deep learning model.

User Classes and characteristics

After work into our system, the user will access the graphical user interface page. Yoga create slighter is detect the poses perform by user square measure correct or not.

Assumptions and Dependencies

Using Python language and Input as Yoga create Dataset Dependencies: Python is usually used for developing websites and code, task automation, information analysis, and information visual image. Since it's relatively easy to learn, Python has been adopted by many nonprogrammers such as accountants and scientists, for a variety of everyday tasks, like organizing finances

Python may be a all-purpose programing language, so it can be used for several things. Python is employed for internet development, AI, machine learning, operational systems, mobile application development, and video games and many more. Python is a comparatively simple programming language to learn and follows an organized structure. Python is a general purpose and high level programming language. You can use Python for developing desktop GUI applications, websites and web applications. The simple syntax rules of the programming language further makes it easier for you to keep the code base readable and application maintainable.

LITERATURE SURVEY

STUDY OF RESEARCH PAPER

Implementation of Machine Learning Technique for Identification of Yoga Poses:-

In recent years, yoga has become part of life for many people in the world. Due to this there is need of scientific analysis of y postures. it's been discovered that pose detection techniques is accustomed establish the postures and assist the individuals to perform yoga a lot of accurately.   Recognition of posture may be a difficult task due to the dearth availableness

of dataset and additionally to sight posture on real-time bases. Angles of the joints in the human body are extracted using the tf-pose skeleton and used them as a feature to implement various machine learning models. 80% of the dataset thus been used for training purpose and 20% of the dataset has been used for testing. This dataset is tested on completely different Machine learning classification models ANd achieves an accuracy of 99.04% by employing a Random Forest Classifier. To overcome this drawback an oversized dataset has been created which contain a minimum of 5500 pictures of 10 completely different yoga pose and used a tf-pose estimation formula that draws a skeleton of an individual's body on the real-time bases.

Yoga-82: A New Dataset for Fine-grained Classification of Human Poses:- Existing datasets for learning of poses are discovered to be not difficult enough in terms of pose diversity. Human create estimation may be a well-known problem in pc vision to find joint positions. This makes the create annotation method comparatively easy and restricts the applying of the models that are trained on them To handle a lot of selection in human poses, we propose the construct of fine-grained stratified create classification, within which we have a tendency to formulate the create estimation as a classification task, and propose a dataset, for large scale yoga create recognition with 82 classes. Yoga82 consists of advanced poses wherever fine annotations might not be potential. To resolve this, we offer stratified labels for yoga poses supported the body configuration of the pose.   The dataset contains a three-level hierarchy including body positions, variations in body positions, and the actual pose names. We present the classification accuracy of the state-of-the-art convolutional neural network architectures on Yoga82. We also present several hierarchical variants of Dense Net in order to utilize the hierarchical labels.

Recognition of yoga poses exploitation EMG signals from lower:-

Exercise with yoga postures is very popular nowadays because yoga exercises can help to increase flexibility and muscle strength and improve the respiratory system. However, the correctness of the yoga postures is tough to check, and therefore practitioners might not be able to profit from the exercises

absolutely. The study enclosed 10 subjects, five males and 5 females. information were collected throughout five yoga postures. This paper focuses on the use of Electromyography signals for analyzing the motion of four lower-limb muscles of both legs. Recognition was performed with three machine learning algorithms. This pa- per presents a yoga posture recognition system to verify the correctness of the lower muscle movements while practicing yoga. The results showed that the Random Forest call Tree formula has the very best accuracy in recognizing yoga postures compared with alternative algorithms which the yoga posture recognition model is correct at 87.43 percent.

Synthesizing Images of Humans in Unseen Poses:-

We address the computational problem of novel human pose syn- thesis. Given an image of a person and a desired pose, we produce a depiction of that person in that pose, retaining the appearance of both the person and background. We present a modular generative neural network that synthesizes unseen poses using training pairs of images and poses taken from human action videos. These subtasks, implemented with separate modules, are trained jointly using only a single target image as a supervised label. Our network separates a scene into different body part and background layers, moves body parts to new locations and refines their appearances, and composites the new foreground with a hole-filled background. We demonstrate image synthesis results on three action classes: golf, yoga/workouts and tennis, and show that our method produces accurate results within action classes as well as across action classes. Given a sequence of desired poses, we also produce coherent videos of actions. Novel IoT-Based Privacy-Preserving Yoga Posture Recognition System Using Low Resolution Infrared Sensors and Deep Learning.

In recent years, the amount of yoga practitioners has been drastically in- wrinkled and there square measure a lot of men and older people follow yoga than ever before. web of Things (IoT)- primarily based yoga coaching system is required for people who want to follow yoga reception. Some studies have proposed RGB/Kinect camera-based or wearable device based yoga posture recognition ways with a high accuracy; but, the previous contains a privacy issue and therefore the latter is impractical within the long application. Thus, this paper proposes AN IoT-based privacy-preserving yoga posture recognition system using a deep convolutional neural network (DCNN) and a low resolution infrared detector primarily based wireless detector network (WSN). The WSN has 3 nodes (x, y, and z-axes) every integrates 8×8 pixels' thermal detector

module and a Wi-Fi module for connecting the deep learning server. we have a tendency to invited eighteen volunteers to perform twenty six yoga postures for 2 sessions every lasted for 20s. Totally, 93200 posture pictures square measure utilized for the validation of the proposed DCNN models. The multiple cross validation results discovered that F1-scores of the models trained with xyz (all 3-axes) and y (only y-axis) posture pictures were 0.9989 and 0.9854, severally. a median latency for a single posture image classification on the server was 107ms.

Developing robust core muscles square measure necessary for children. youngsters with robust core muscles permit them to do any forms of activities that principally involve physical movement. The work tested on AN education organization that aims to strengthen core muscles by providing yoga like poses. There square measure certified trainers that may coach the students on the approach. However, mistakes may well be made throughout the employment attributable to completely different trainer's justification and whether or not the employment processes were done properly. Therefore, an answer is projected to develop a computerized create detector package that allows the trainers to boost the employment with the students. The result's promising wherever the standardized pose may well be enforced and compared discovered students' poses, but it's found that thanks to the uniqueness of the poses, it generates many results.
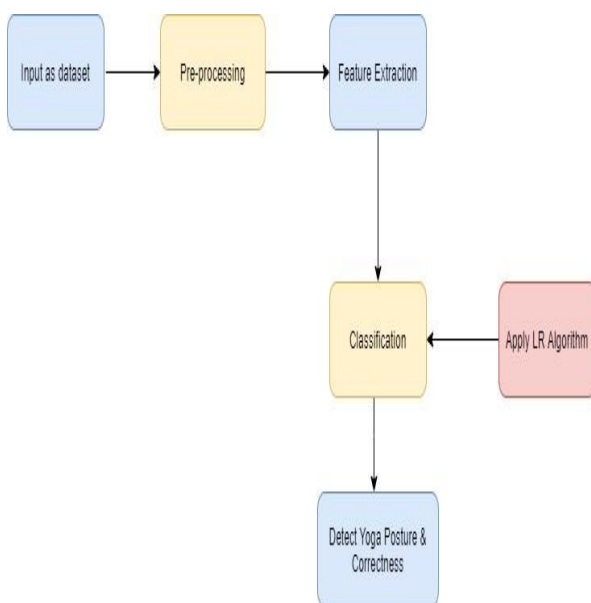
1. SYSTEM METHODOLOGY

Fig. System Architecture

A system model for we have a tendency to square measure giving AN input as dataset then perform the preprocessing step afterward we are going to extract the feature extraction as points of human joints then we have a tendency to will apply LR (Linear Regression) formula through which sight yoga posture properly.

DISCUSSION

We address the machine drawback of novel human pose synthesis. Given a picture of someone and a desired pose, we have a tendency to manufacture an outline of that person therein create, retaining the looks of each the person and background. we have a tendency to give a standard generative neural network that synthesizes unseen poses exploitation coaching pairs of pictures and poses taken from act videos. For hard the results from the experiments, we have designated the main angles that differs the poses and calculated each angle for each experiment exploitation LR algorithm.

CONCLUSIONS AND FUTURE SCOPE

We will propose yoga posture recognition and correction in the projected system. The system evaluates a learner's Yoga create by Detecting the create. mensuration the difference in body Angles between an instructor's and a user's stance. distinguishing the inaccurate half between the learner and therefore the teacher. Categorizing the create into four levels supported the typical angle distinction.

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