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Virtual Yoga Assistant using Machine Learning and Artificial Intelligence

Gayatri Pendhar, Amruta Potphode, Swati Jagtap, Nikhil Lawale, Dr. Swati A. Bhavsar
Department of Computer Engineering
Matoshri College of Engineering and Research Center, Eklahare, Nashik, Maharashtra, India

Abstract: *In recent years, yoga has become part of life for many people across the world. Due to this there is the need of scientific analysis of y postures. It has been observed that pose detection techniques can be used to identify the postures and also to assist the people to perform yoga more accurately. Recognition of posture is a challenging task due to the lack availability of dataset and also to detect posture on real-time bases. To overcome this problem a large dataset has been created which contain at least 5500 images of ten different yoga pose and used a tf-pose estimation Algorithm which draws a skeleton of a human body on the 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 has been used for training purpose and 20% of the dataset has been used for testing. This dataset is tested on different Machine learning classification models and achieves an accuracy of 99.04% by using a Random Forest Classifier.

Keywords: YOGI - YOga Gesture Identification dataset, Computer Vision, Machine Learning, Classification, Gesture Recognition

I. INTRODUCTION

A virtual yoga assistant software is a digital tool designed to provide guidance, support, and resources for individuals practicing yoga. This software can offer a wide range of features to enhance the yoga experience, whether you're a beginner or an experienced yogi. Here are some key features and functions that such software could include: Customized Yoga Plans: The software can create personalized yoga routines based on a user's goals, fitness level, and preferences. Users can specify whether they want to focus on flexibility, strength, relaxation, or a combination of these. Video Tutorials: Provide a library of yoga poses and flows with video demonstrations by experienced yoga instructors. Users can follow along with these videos to ensure they are performing poses correctly. Voice-guided Sessions: Offer audio instructions during yoga sessions, guiding users through each pose, breathing exercises, and meditation. This can be particularly helpful for users who prefer not to watch a screen while practicing. Progress Tracking: Keep a record of a user's yoga practice history, such as the number of sessions completed, progress in achieving specific goals, and overall performance improvement. Meditation and Breathing Exercises: Include guided meditation sessions and breathing exercises to promote relaxation, mindfulness, and stress reduction. Yoga Pose Analyzer: Use computer vision technology to analyze a user's alignment and form during yoga poses. Provide real-time feedback and suggestions for improvement. Community and Social Features: Allow users to connect with others who share their interest in yoga, join virtual yoga classes or challenges, and share their progress on social media. Nutritional Guidance: Provide information on yoga-friendly diets and nutrition plans to complement the physical practice. Equipment Recommendations: Suggest yoga mats, props, and clothing suitable for different styles of yoga and skill levels. Yoga Philosophy and Knowledge: Offer articles, videos, and resources to help users deepen their understanding of yoga's philosophy, history, and its holistic approach to well-being..

II. PURPOSE

To develop Virtual Yoga Assistant by using Machine Learning and Artificial Intelligence which monitor human body parts movement the Accuracy of different Yoga Poses which guides the User to Practice Yoga.

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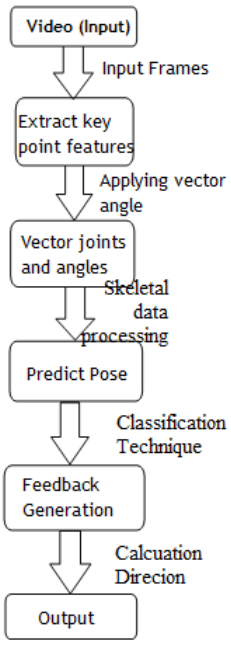
Yoga is an ancient Indian science and a way of living that includes the adoption of specific bodily postures, breath regulation, meditation, and relaxation techniques practiced for health promotion and mental relaxation.
Yoga has been adopted internationally for its health benefits. Among several techniques, physical postures have become very popular in the Western world. Yoga is not only about the orientation of the body parts but also emphasizes breathing and being mindful.

III. OBJECTIVE OF SYSTEM

- To do thorough literature survey on the Yoga Posture Recognition By Detecting Human Joint Points In Real Time.
- To design appropriate algorithms and system for the Pose Estimation and Productive human body posture.
- To implement the algorithm for the Virtual yoga Monitoring Assistant
- To test and validate the results.

IV. SYSTEM ARCHITECTURE

Skin diseases are a widespread health concern affecting millions of people worldwide. These conditions can range from mild irritations to severe, potentially life-threatening illnesses. Early detection and accurate diagnosis of skin diseases are crucial for effective treatment and prevention of complications



User Registration:
Here User has to register with required parameters such as name, mobile, password and hardware ID.

User Login:
After user registration done successfully user can login to the system

Video Input:
After successful login we input from video key extraction point feature.

Predict Pose
Feed Back Generation
Algorithm & Mathematical Model

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S={I, O, P, S, C, P, Ad, Q, G,H/w, S/w, Failure, Success}
Where
S=System
C= Check Mood U=User
Ad=Admin
G=Pose Detection.

Procedures {P}= {Pr, Cc, Qid, Amt} Where,
Pr= Check Features
Qid= Find Pose
O is Output of system
Output {O} = {Output1, Output2, Output3} Where,
Output1=Image Scan successfully Verify
Output2=Match with train data(Pose).
Output3=Detection of Pose

V. CONCLUSION

A system is suggested that classify ten yoga poses and the dataset upholds on six classification models of machine learning. The yoga pose is detected based on the angles extracted from the Skeleton joints of TF pose estimation algorithm. 94.28 accuracy altogether was attained of all machine learning models. The data preprocessing and model training was done on Google Colab and Ubuntu 18.04.4 LTS terminal. Future ideas also includes expansion of YOGI dataset on more yoga poses and implement deep learning modules for better performance

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REFERENCES

[1] Muhammad Usama Islam ; Hasan Mahmud ; Faisal Bin Ashraf ; Iqbal Hossain; Md. Kamrul Hasan ”Yoga posture recognition by detecting human joint pointsin real time using microsoftkinect.” IEEE Region 10 Humanitarian TechnologyConference (R10-HTC).pp.1-5, 2017.
[2] Hua-Tsung Chen, Yu-Zhen He, Chun-Chieh Hsu, Chien-Li Chou, SuhYinLee, Bao-Shuh P. Lin, “”Yoga posture recognition for selftraining.” InternationalConference on Multimedia Modeling.Springer, pp.496-505, 2014.
[3] Xin Jin ; Yuan Yao ; Qiliang Jiang ; Xingying Huang ; Jianyi Zhang ; XiaokunZhang ; Kejun Zhang, “Virtual personal trainer via the kinect sensor” IEEE 16th International Conference on Communication Technology (ICCT). pp.1-6, 2015.
[4] Pullen, Paula, and William Seffens. “Machine learning gesture analysis of yoga for exergame Development.” IET Cyber-Physical Systems: Theory Applications,vol.3, no.2, pp.106-110, 2018.
[5] Trejo, Edwin W., and Peijiang Yuan. ”Recognition of Yoga poses through aninteractive system with Kinect device.” 2nd Inter- national Conference on Roboticsand Automation Sciences (ICRAS), 2018.