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Suryanamaskar Pose Detection System Using Machine Learning

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ABSTRACT: A deep learning model is proposed which uses convolutional neural networks/LR algorithm for yoga pose identification along with a human joints localization model followed by a process for identification of errors in the pose for developing the system. After obtaining all the information about the pose of the user the system gives feedback to improve or correct the posture of the user. we propose an improved algorithm to calculate scores that can be applied to all poses. Our application is evaluated on different Yoga poses under different scenes, and its robustness is guaranteed.

KEYWORDS: Yoga, OpenPose, Pose Assessment, Machine Learning, Classification

I. INTRODUCTION

Humans are naturally vulnerable to a variety of health issues, with musculoskeletal illnesses being a critical area that needs prompt attention. As a result of accidents or age, a significant number of people experience musculoskeletal diseases every year. Yoga can help you achieve greater physical health. [1] [9] Exercise has a lot of advantages, but if done incorrectly, it can result in a dangerous lifestyle. Hence, people who are executing tasks on their own must have the correct instruction. A person can benefit from hobbies in many ways while also enhancing their health with the correct guidance.[4] Yoga postures help to develop alertness, coordination, and power in both the mind and the physique. A wrong yoga pose, on the other hand, can result in catastrophic complications. [5] As a result, suitable yoga postures must be followed. Yoga is an ancient practice of physical, mental, and spiritual disciplines that has become increasingly popular in recent years. As such, there is an increasing interest in developing automated methods for accurately detecting yoga poses in real-time. [8]The most common approach to real- time pose detection is to use convolutional neural networks (CNNs) to extract features from the input images, followed by a linear regression step to identify the corresponding poses.[3]However, this approach has several limitations, such as the difficulty of accurately differentiating between poses, and the need to manually label each pose.[11]To address these limitations, we propose a novel method for real-time yoga pose detection using CNNs, OpenPose, and linear regression in Python. Our method combines the benefits of both approaches, allowing us to accurately differentiate between poses, while also reducing the need for manual labeling. We evaluate our method on a dataset of yoga poses, and show that it is able to accurately identify poses in real-time.

II. METHODOLOGY

Gather a comprehensive dataset of images and videos depicting various yoga poses, including Surya Namaskar, from diverse angles and perspectives.Preprocess the collected data to standardize image sizes, remove noise, and enhance image quality, ensuring consistency and clarity in the dataset.Utilize pose estimation techniques, such as OpenPose or PoseNet, to extract key body joint positions and angles from the annotated images and videos.

III. SYSTEM DESIGN

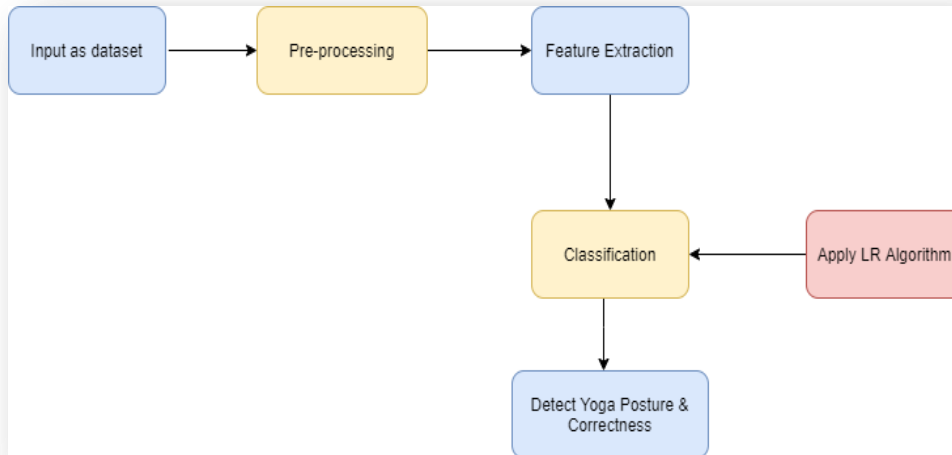


Figure 3.1: System Architecture

• Admin

In this module, the Admin has to log in by using valid user name and password. After login successful he can do some operations such as View All Users and Authorize,

• View and Authorize Users

In this module, the admin can view the list of users who all registered. In this, the admin can view the user's details such as, user name, email, address and admin authorizes the users.

• View Charts Results

View All Products Search Ratio, View All Keyword Search Results, View All Product Review Rank Results.

• End User

In this module, there are n numbers of users are present. User should register before doing any operations. Once user registers, their details will be stored in the database. After registration successful, he has to login by using authorized user name and password. Once Login is successful user will do some operations like Manage Account, Search Products by keyword and Purchase, View Your Search Transactions, View.

IV. RESULTS

The expected outcome of a yoga pose detection and correction system is to provide real-time feedback to users on how to improve their yoga postures and avoid incorrect or harmful poses. Such a system can use various techniques, such as deep learning, computer vision, and pose estimation, to analyze the user's body movements and compare them with the desired yoga poses.

V. CONCLUSION

Surya Namaskar and yoga pose detection have the potential to enhance the practice of yoga by providing valuable feedback, promoting correct alignment, and making yoga more accessible. However, these technologies are not without limitations, including technical challenges, privacy concerns, and cost. When used thoughtfully and in conjunction with traditional yoga practices, pose detection can be a valuable tool for both beginners and experienced practitioners, helping them reap the physical and mental benefits of yoga while reducing the risk of injury. As technology continues to advance, it is likely that pose detection systems will become more accurate and widely accessible, further enriching the yoga experience for individuals and communities alike.



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