Yoga Posture Classification and Grading

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Description

With the growing popularity of home yoga, maintaining precise postures is essential to prevent injuries and maximize effectiveness. However, beginners often lack expert guidance.

This project aims to develop a yoga posture recognition model that can classify eight yoga poses from the static images. The long term goal is to extend this model for real time feedback and posture correction, helping users improve their alignment. The selected postures focus on back pain prevention and posture correction.

Past Research

1. A Computer Vision-Based Yoga Pose Grading Approach Using Contrastive Skeleton Feature Representations by Yubin Wu et al.
    - BlazePose model for pose estimation through skeletal keypoint extraction
    - Contrastive learning to enhance pose feature representation
    - Focused on grading yoga poses
    - Achieved superior performance in both pose classification and grading accuracy using benchmark datasets.
2. Real-time Pilates Posture Recognition System Using Deep Learning Model by Hayoung Kim et al.
    - BlazePose model for pose estimation
    - Implemented deep learning-based classification of 8 Pilates and unknown postures
    - Optimized for real-time recognition with a lightweight architecture

Dataset

- Primary Datasets used:
  - Yoga Poses Dataset
  - Training dataset size: Downdog (223 images), Goddess (180), Plank (266), Tree (160), Warrior (252)
  - Testing dataset: Downdog (97), Goddess (80), Plank (115), Tree (69), Warrior (109)
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- Five yoga poses selected for classification:

Downdog

Goddess

Plank

Tree

Warrior

Final Dataset Preparation

Data Augmentation :

Challenges

1. Less Variation

Expected Outcomes

1. A deep learning model that accurately classifies up to eight yoga poses.

2. Recognizes yoga pose from images with varying body types, genders, camera angles, and lighting.

3. The model should recognize poses even when done slightly inaccurately or performed with minor adjustments.

We need:

Team name ✔
Topic ✔
Previous solutions (github, etc)✔
Datasets ✔
Data exploration
Data cleansing
Data prep
challenges