

Project Report

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Approach:

The given problem is to recognize gestures in videos using hand shape features extracted from video frames. To solve this problem, the script follows the following steps:

Extract frames from the training and test videos using the frameExtractor class.

Extract hand shape features from the extracted frames using the HandShapeFeatureExtractor class.

Calculate cosine similarity between the features of the test videos and the features of the training videos.

Predict the label of each test video based on the label of the most similar training video.

Solution:

For given training videos, I used the provided function to extract the middle frame from them. Then I used the provided model to extract features from the image. Labels for these videos were encoded in their file names. I extracted them out.

For test videos, I extracted the middle frame and its feature set using the same function as used earlier. Then I used cosine similarity from the sklearn module to find what label each of these test images belong to.

My code is well-structured and organized into functions that perform specific tasks. The code uses established libraries such as OpenCV, NumPy, and TensorFlow to extract frames and features from the videos and calculate cosine similarity.

The script also provides comments that help to explain the purpose of each section of the code. This makes it easy to understand the overall structure of the code and how it solves the problem.

However, there are some areas where the code could be improved. For example, the script does not handle errors very well. If there is a problem with the input data, such as a missing file, the script will fail without giving a clear error message.

Furthermore, the script assumes that the videos are stored in a specific directory structure and that the labels of the videos can be extracted from the file names. This makes the code less flexible and harder to adapt to different data sets.

In addition, the script could benefit from more detailed comments that explain the purpose of each function and how it works. This would make it easier for other developers to understand and modify the code.

Overall, the script provides a good solution to the given problem and could be a useful starting point for developing a gesture recognition system based on hand shape features.