

SmartHome Gesture Control Application

CSE 535 Project 2

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Problem Statement

To develop python application for extracting the middle frame of the 51 pre captured videos and train the CNN model. Cosine Similarity should be used to recognize gesture from the trained frame and test frame.

Technology Requirements

- Python
- TensorFlow
- OpenCV
- Keras

Approach Taken

1

Generate the penultimate layer for the training videos.

Extract middle frames using the frameextractor method and use HandShapeFeatureExtractor which uses CNN to extract features from the frame

2

Generate the penultimate layer for the test videos

Use the same method explained in stage 1 to extract features out of test videos.

3

Gesture recognition of the test dataset.

Use cosine similarity to recognize the gesture. Numpy libraries are useful to compute cosine similarities.

Solution

Output results.csv file with gesture recognized labels of the test videos. This is achieved using cosine similarity and using the highest match label. Numpy libraries are used to develop the cosine similarity formula mentioned below:

$$\text{Cosine Similarity} = (A \cdot B) / (\|A\| \|B\|)$$