

Assignment-8

Image Classification using Deep and Hand-Crafted Feature Modeling

[1-4] Questions Carry 22.5 Marks each & 5th Question Carries 10 Marks

1. Extract deep features from the pre-trained VGG-16 model and extract hand crafted Histogram Oriented Gradient (HOG) features for MNIST dataset. Stack the deep features with HOG features and model it using a random forest classifier to classify the MNIST dataset. Run the hybrid model 5 times and compute the mean accuracy.
2. Extract deep features from the pre-trained VGG-16 model and extract hand crafted Scale Invariant Feature Transform (SIFT) features for MNIST dataset. Stack the deep features with SIFT features and model it using a random forest classifier to classify the MNIST dataset. Run the hybrid model 5 times and compute the mean accuracy.
3. Extract deep features from the pre-trained VGG-16 model and extract hand crafted SIFT and HOG features for MNIST dataset. Stack the deep features with HOG and SIFT features and model it using a random forest classifier to classify the MNIST dataset. Run the hybrid model 5 times and compute the mean accuracy.
4. Extract deep features from the pre-trained VGG-16 model and extract hand crafted SIFT and HOG features for MNIST dataset. Stack the deep features with HOG and SIFT features and use PCA to transform and reduce the dimension (Test using different component values). Model the transformed features using a random forest classifier to classify the MNIST dataset. Run the hybrid model 5 times and compute the mean accuracy.
5. Draw conclusions on the best model among the above four models for classifying MNIST dataset.