ASSIGNMENT 3

You need to choose either Assignment 3 or Assignment 4

Object Classification

This assignment involves object classification using either Normal Bayesian Classifier available with OpenCV.

You will use Caltech -101 image dataset in this assignment. The dataset consists of about 50 images of each of 101 diverse object types and some standard background images. (Read more details here).

Suggested steps:

1. Choose three different categories of objects from the Caltech 101 dataset, as diverse from each other as possible.

   Note that there are some 'easy' categories with more training examples; you may like to use them.

2. Extract some local features (SIFT/SURF), cluster them using k-Means algorithm, and create a bag-of-words representation for images. This bag-of-word representation is to be used as image feature in the subsequent steps.

   Perform this step with all images of the three selected image categories taken together. Use an appropriate value for k. Do not use raw local features for classification.

3. Choose approximately half of the images from each category, as training data. Save the rest as test data.

4. Train Normal Bayesian Classifier of OpenCV to distinguish between the three object categories using the chosen training data.

5. Test the performance of the classifier separately with training data and the test data. Report the accuracy and the confusion matrix.

6. Experiment with the parameters, like k for k-Means algorithm, size of training dataset, etc.

7. You need to submit your code and a report stating details of experimentation, results (with examples) and an analysis.

8. *If you want to go an extra mile*, try Decision Tree and compare the results.