Assignment 1 – AIP 2019 (Due – 3th Feb, 2019)

In this assignment, we will compare Bag of Words (using SIFT features) and CNN descriptors for image retrieval. For this experiment, use the given data (Optional: if you want, you can use additional data/classes). Take the 5 images from the test folder for testing.

For SIFT based BOW model,

Step 1: Feature Extraction: Extract SIFT keypoints and descriptors from the images. You can use any publicly available code.

Step 2: Run k-means clustering on the training features (or its subset) to learn the cluster centers. You can write your own k-means code or find code on the web. Experiment with different sizes (values of k).

Step 4: BOW feature computation.

Step 5: Use kNN to find the class of each test image and compute the classification accuracy.

For CNN features:

1) Load pre-trained AlexNet model and extract CNN features for the same set of images. Repeat Step 5 from above and get the performance. You can experiment with additional models as well. Extract the features from the last/second-last fc layer.

You should include the following things in your report:

1. Details of your implementation. For SIFT features, include some images with matched features. Any learnings / problems faced.

2. Comparison between the different features. Your observations and analysis should be as detailed as possible.

3. You should give the link to codes used, and other details. There is no need to include descriptions of SIFT and AlexNet.

4. Extra marks will be given for the optional parts.