CIE552 project3

Decisions:

1- tiny image:

We tried and measured different parameters to get the best combination that leads to highest accuracy and we found out that:

Tiny image size: we stated with 8*8 and increased it until 128*128 and the best result were achieved when we used 32*32

Filter: we tried to not use filters, use average filter and gaussian filter and using gaussian filter with 7*7 size was the best choice

Normalization: it didn't add much accuracy (about 0.1)

2-nearest neighbor:

We measured different methods and parameters and the results were as follow:

k : increasing K increased the accuracy until going higher than 5, the accuracy started to decrease

distance : using distance in the process increased the accuracy instead of using the count only

3- hog:

Image size: increasing the size increases the accuracy but makes the code so slow

Pixel and block size: we measured different combinations of them and found out that making them both equal to 6 increased the accuracy

4-SVM:

We measured the performance of different kernels and found out that RBF gives the best performance (linear: least one,sigmoid: better results, RBF: the best results)

5-vocab count:

We changed the count of vocabs from 10 to 1000 and measured the accuracy

The accuracy increased as we increases the number of vocabs but it consumes a lot of time

Results:

1- tiny image and nearest neighbor:

The results fluctuates between 15.667 and 21.9 accuracy by changing parameters and got the best results by using gaussian filter with 7*7 size,32*32 image size and K=5

2-bag of words and nearest neighbor:

Increasing the image size makes better results but consumes a lot of time
We got accuracy of 36 with 64*64 image size, 39 with 128*28 image size and 54 with 256*256 image size

3-bag of words and and SVM:

We used 128*128 image size and measured different kernels and found that linear kernel gives the worst performance with 38 accuracy, sigmoid gives better results with 40 percentage and RBF gives 45 percentage

The best results were achieved by bag of words and and SVM with RBF kernel, 6*6 pixel by pixel size, 6*6 cell by cell size, 256*256 resize, normalization and 200 vocab size with 63.2% accuracy