Assignment 4

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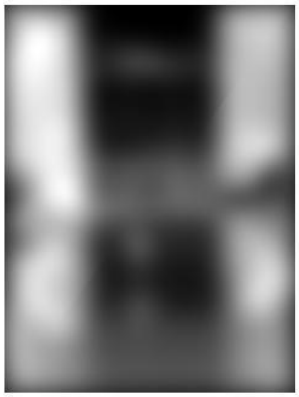
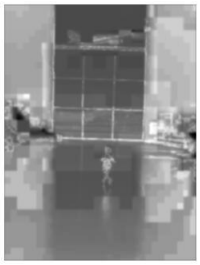
CMPT 762 Computer Vision

Author Note

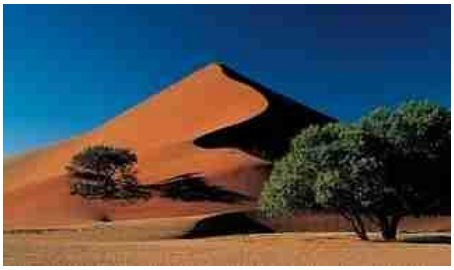
Assignment 4

1.1. Extract Feature Responses

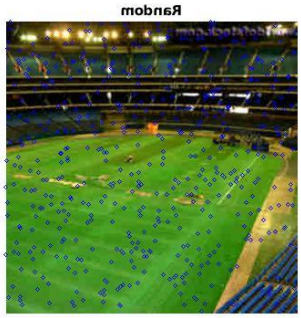


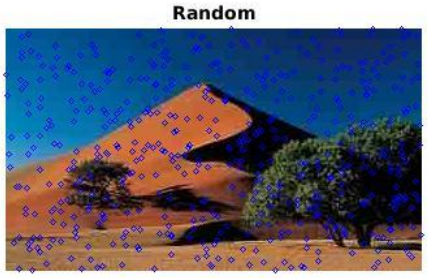



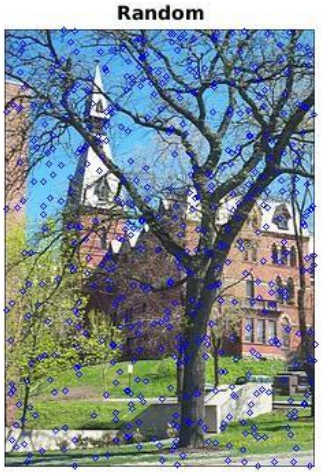
CIE Lab Color space is defined by International Commission on Illumination and it consists of L, a, b. L is the measure of lightness, a is a measure of green to red and b is a measure of blue to yellow. In the task in current assignment it will be useful to have a sense of lightness of a pixel to find the details about its corners.

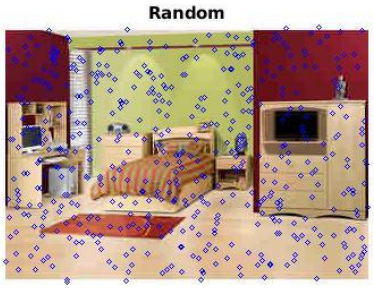
1.2. Collect sample of points from image

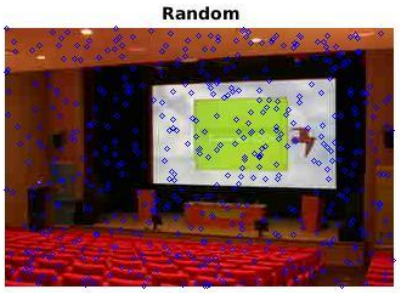
Random

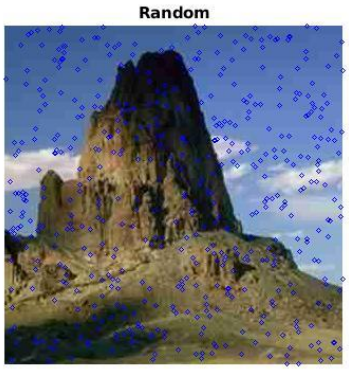




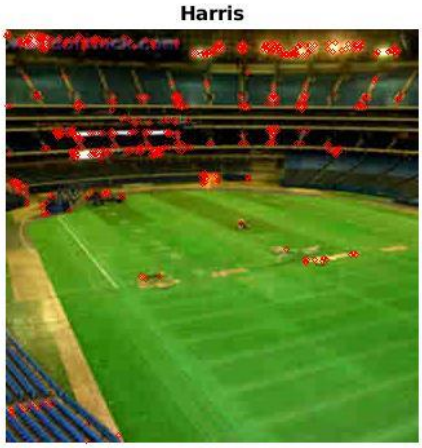


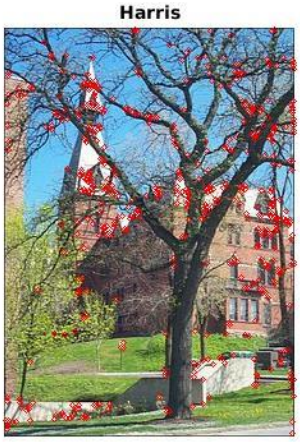


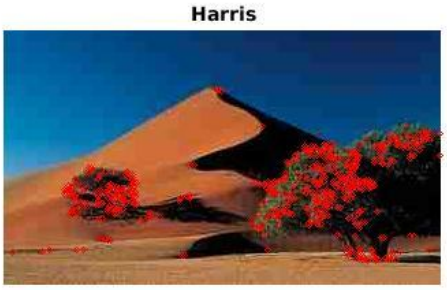

Random

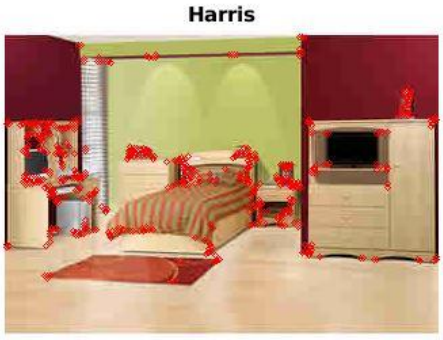

Random

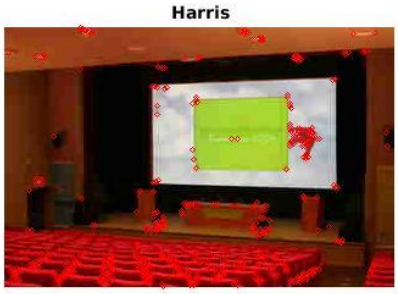
Harris

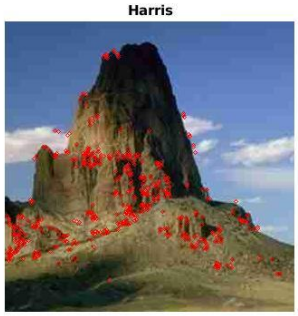






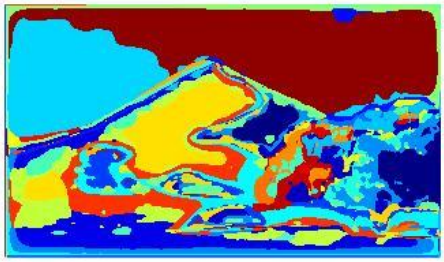


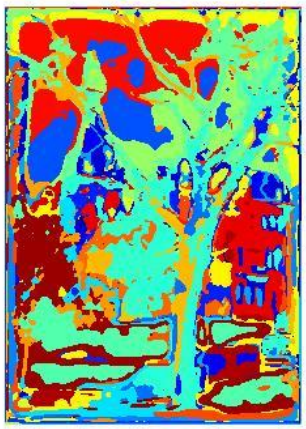


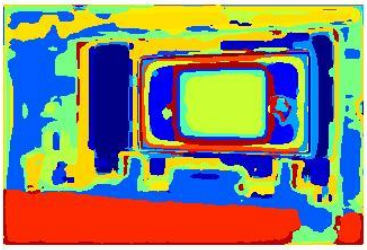


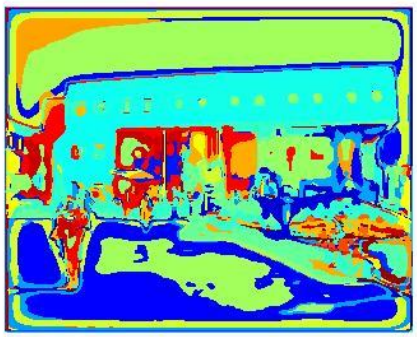
2.1. Convert image to word map

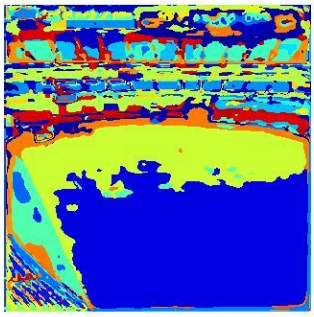
Random

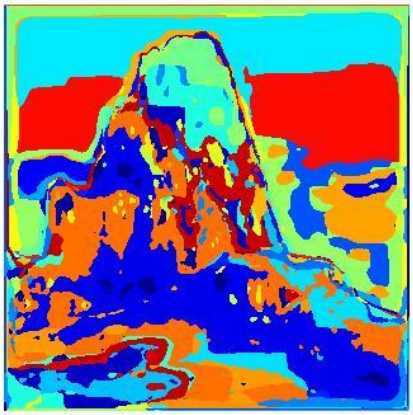




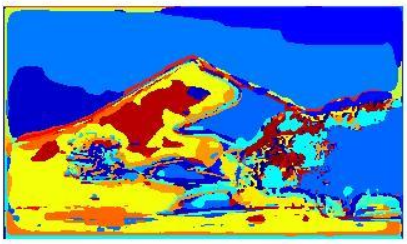


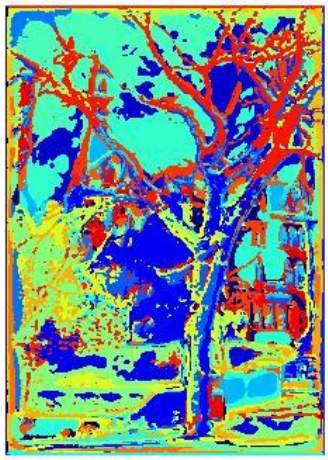


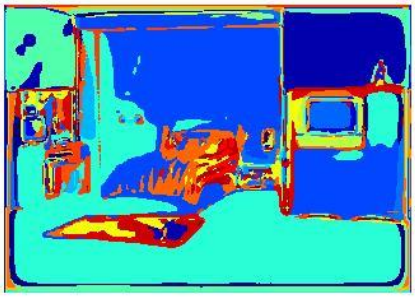


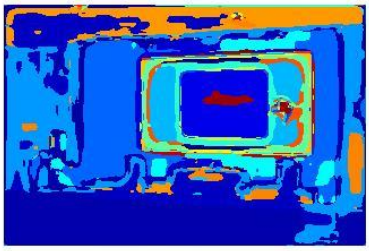


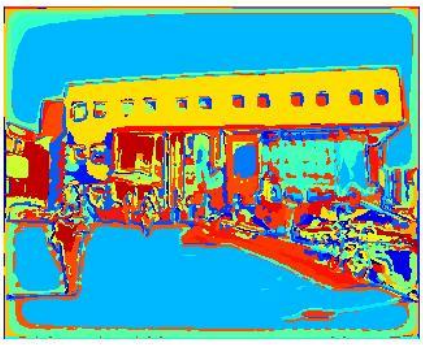
Harris

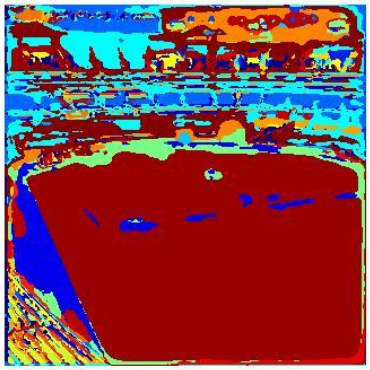


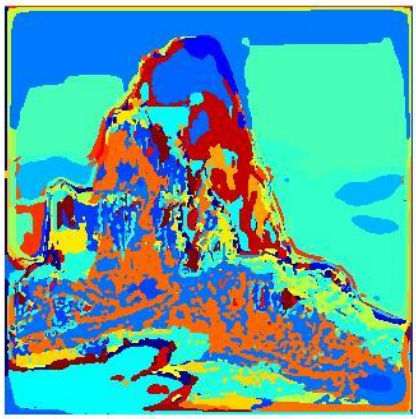








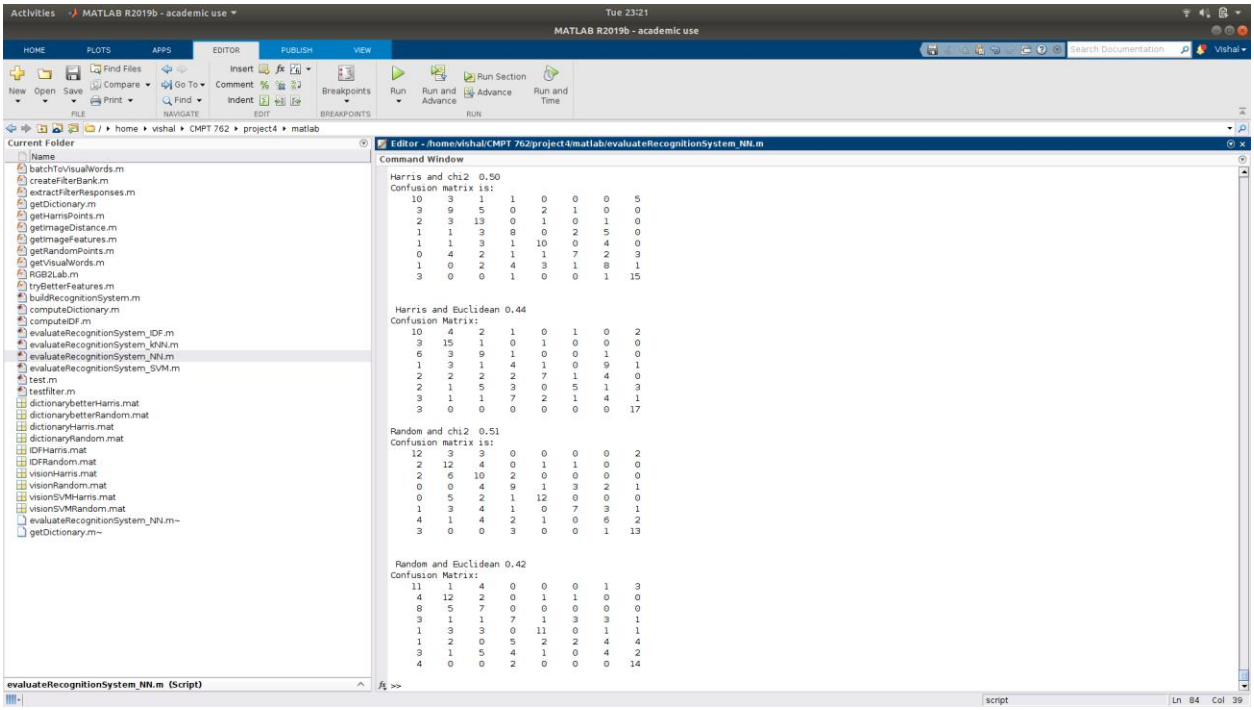




Harris looks better in the images as it gives some semantic meanings as well

3.2. Evaluate Recognition System (NN and KNN)

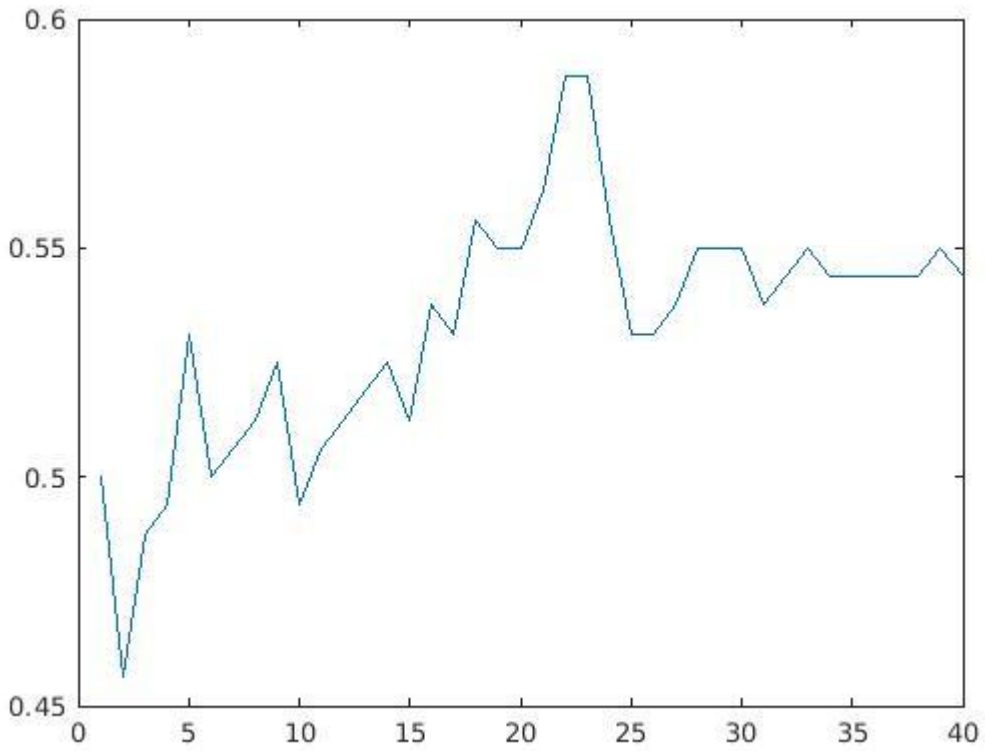
Accuracies and confusion matrix with NN



As Chi2 produced better results in previous I have given the image of Harris and chi2 below

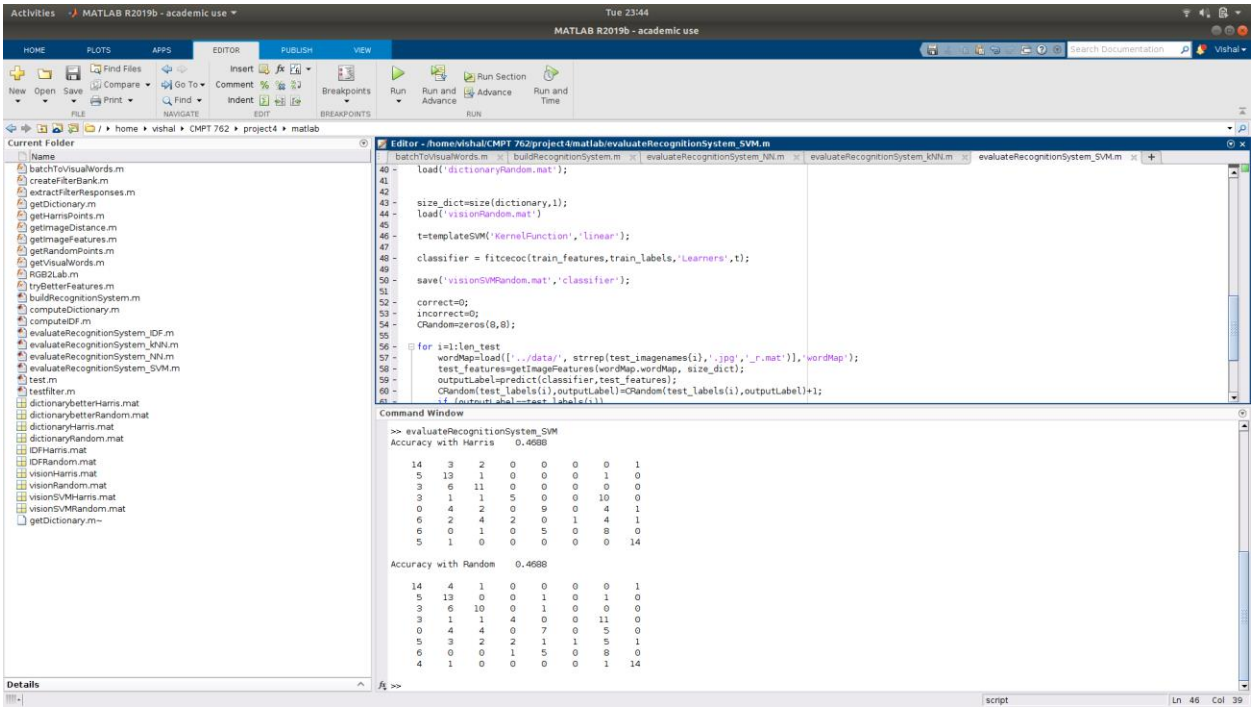
KNN Harris and Chi2

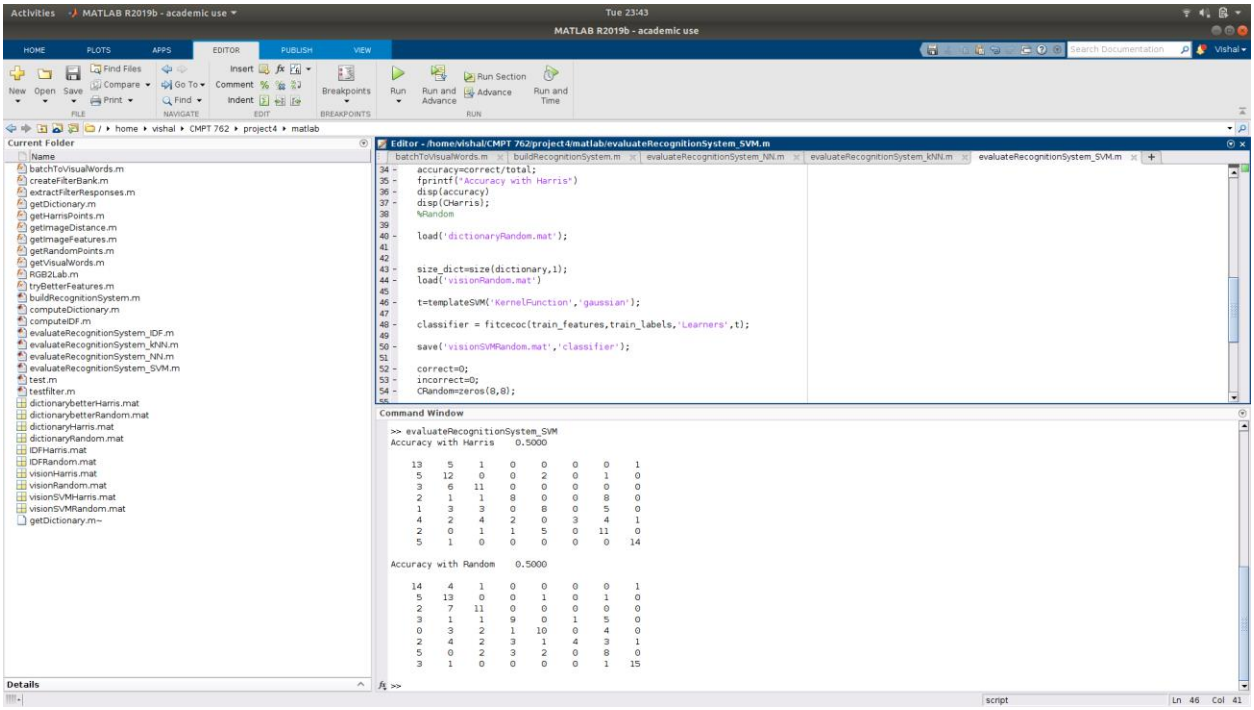
```
>> evaluateRecognitionSystem_kNN
Running kNN
Harris and chi2 Best accuracy is    0.5875

at K    22

    15     2     2     0     0     0     0     1
     4    14     1     0     0     0     1     0
     4     5    11     0     0     0     0     0
     2     2     0    12     0     0     4     0
     0     4     4     0    10     0     2     0
     1     3     4     3     0     6     2     1
     3     0     2     4     3     0     8     0
     1     0     1     0     0     0     0    18

Warning: MATLAB has disabled some advanced graphics rendering features t
fx >>
```



4.1. Evaluate Recognition System (SVM)

SVM is tested with gaussian and linear kernel and gaussian works better.





4.2. Inverse Document Frequency

Matrix is present in the code please check it.

4.3. Better Pixel Features

I tried gobar filters.

Transformation is here and code is present in the folder

Experiments and performance