

# Computer Vision

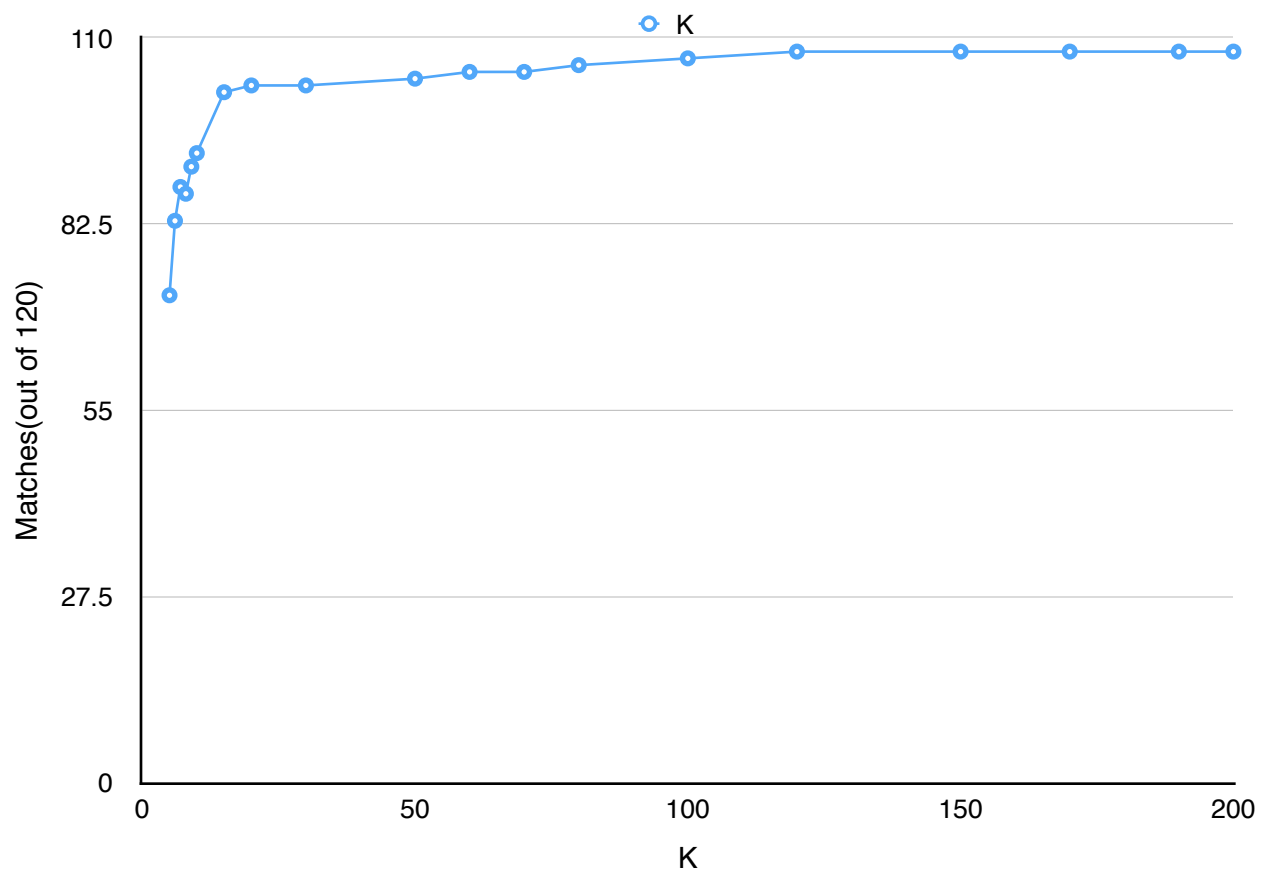
*Assignment 3 Report*

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## ***I - Face Recognition***

For this part of the assignment, the nearest-neighbor recognition algorithm, using Eigenface representation, was implemented in Matlab. The faces used were from the given `ORL_32x32.mat` file, which contained 400 faces from the Olivetti Face database. Each face in the file is a 32 by 32 grayscale image. Below is a plot of the reconstructed training faces for  $K = 20$  and a plot of the classification rate as a function of  $K$ .

K	Matches
5	72
6	83
7	88
8	87
9	91
10	93
15	102
20	103
30	103
50	104
60	105
70	105
80	106
100	107
120	108
150	108
170	108
190	108
200	108



Matched 103 of 120 (86%)



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## ***II - Scene Classification***

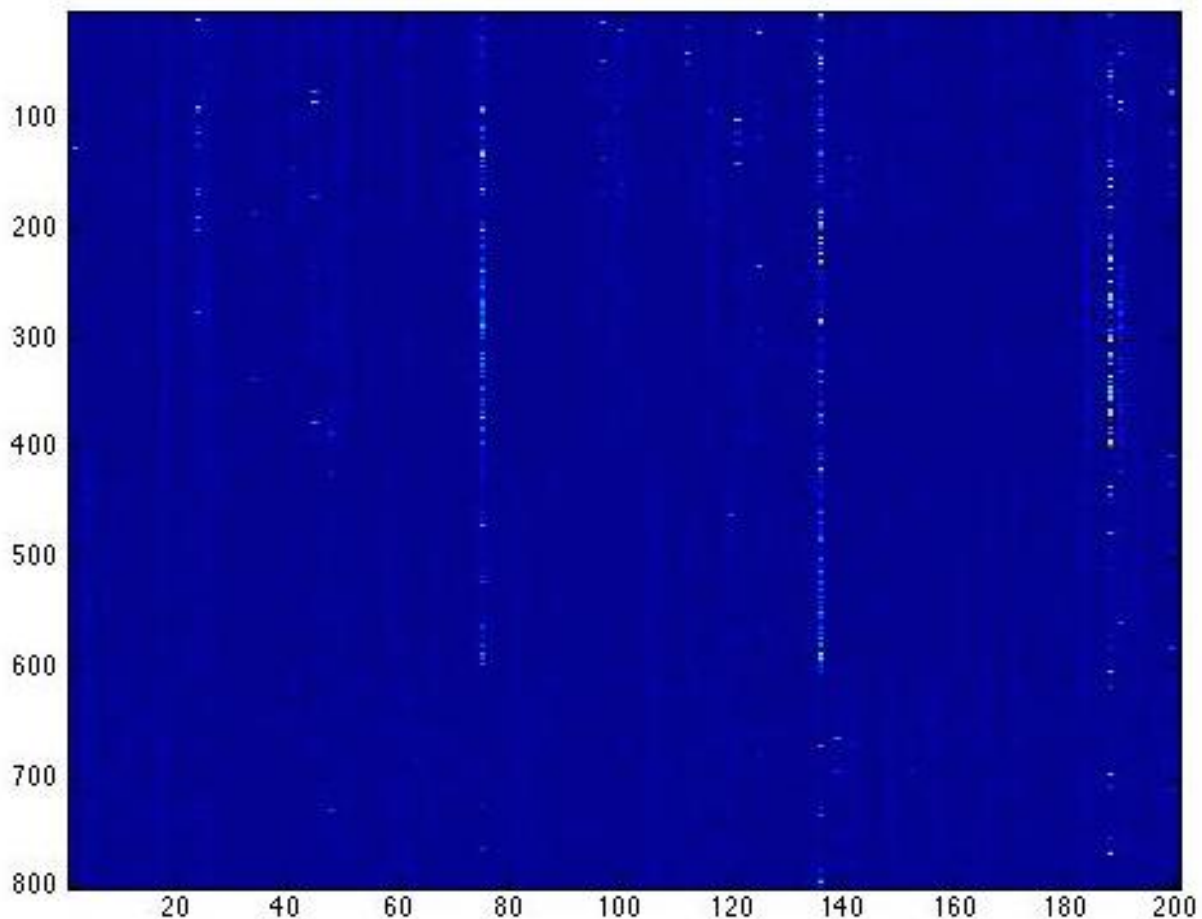
For this part of the assignment, part of the Bag-of-Visual-Words classifier was implemented in Matlab. The classifier was applied to four different scene classes:

- 1 = "coast"
- 2 = "high-way"
- 3 = "street"
- 4 = "city"

Specifically, the given SIFT descriptors of the images were vector-quantized to make the Bag of Words histogram for each image.

### **Vector Quantization**

The following is the HISTOGRAMS matrix computed by the program followed by the image of the matrix.



## Bag-of-Words Classifier

The accuracy of the implemented classifier can be seen below, which is the fraction of test images whose label was predicted correctly.

ACCURACY = 0.7500