

Intelligent Data Analysis and Probabilistic Inference Coursework 4

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1 IDAPIResults04.txt File Contents

Coursework Four Results by Hesam Ipakchi (00648378), Yijie Ge (00650073), Joysen Goes (00649883)

The mean vector of the HepatitisC data set

1.164	3.916	0.448	5.679	4.865	3.778	4.127	3.604	0.217
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The covariance matrix of the HepatitisC data set

5.880	0.245	-0.004	-0.284	-0.346	-0.417	-0.481	-0.267	-0.067
0.245	7.572	0.073	-0.358	-0.346	0.257	2.273	0.946	-0.032
-0.004	0.073	0.247	-0.116	-0.039	-0.003	0.100	0.066	-0.005
-0.284	-0.358	-0.116	16.960	7.969	4.443	-1.036	-0.306	0.047
-0.346	-0.346	-0.039	7.969	8.361	4.921	-0.763	-0.752	-0.001
-0.417	0.257	-0.003	4.443	4.921	6.683	-0.087	-0.376	-0.141
-0.481	2.273	0.100	-1.036	-0.763	-0.087	20.583	1.122	0.014
-0.267	0.946	0.066	-0.306	-0.752	-0.376	1.122	4.317	0.119
-0.067	-0.032	-0.005	0.047	-0.001	-0.141	0.014	0.119	0.170

The component magnitudes for image c.pgm in the principal component basis

1206.254	-1590.133	-248.136	-821.249	246.009	-771.900	963.633
376.967	161.599	-533.276				

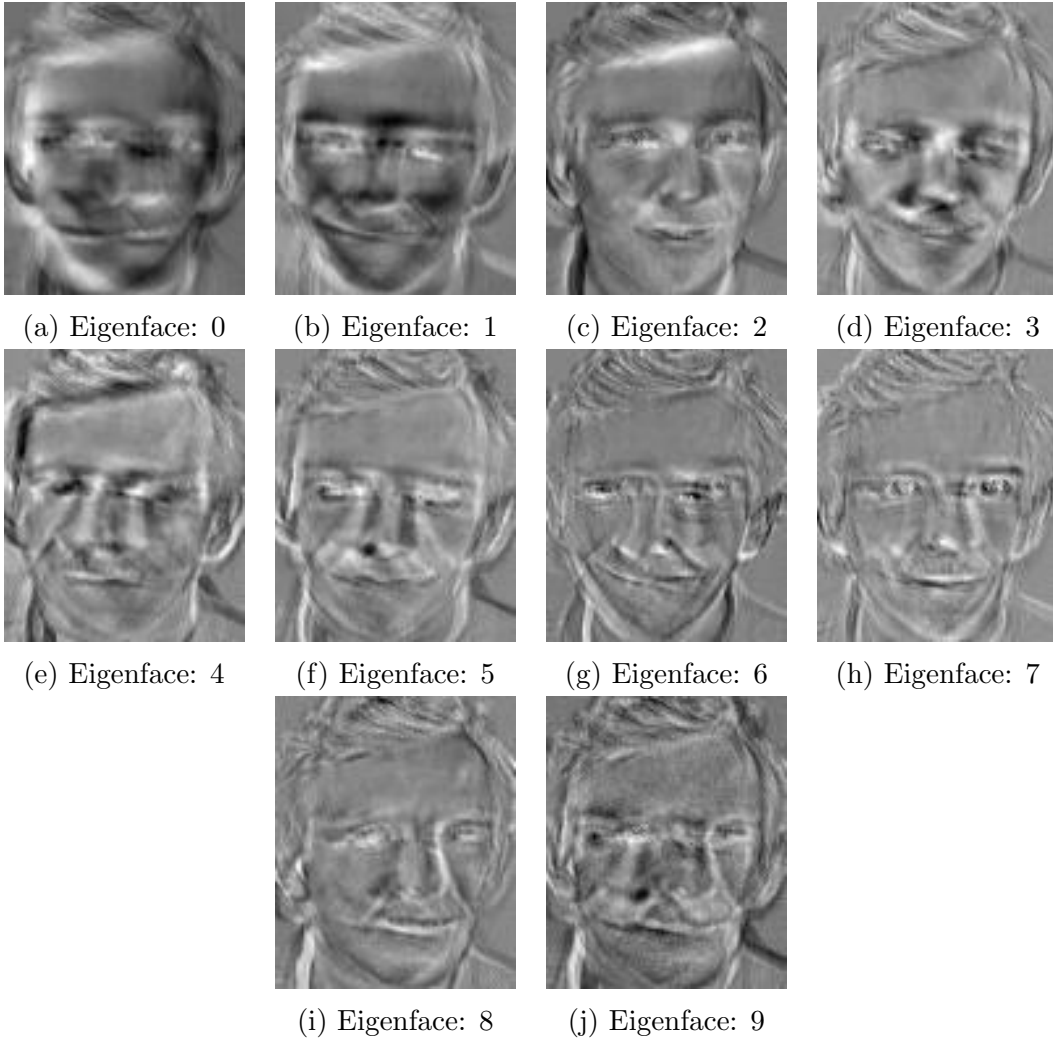


Figure 1: The eigenface images created in task 4.3

2 Task 4.3 Eigenfaces

fig. 1 shows the eigenface images we created in task 4.3. There are 10 of them, numbered from 0 to 9, since there were 10 principal components given.

3 Task 4.4 Partial Reconstructions

fig. 2 shows the partial reconstructions of image c.pgm created in task 4.4. The first image (Reconstructed Image: 0) represents the mean image, whilst the i -th image (Reconstructed Image: i) represents the mean image plus all up to i -th principal component. There are 11 images in the figure since there are 10 principal components (including the one associated with a zero eigenvalue).

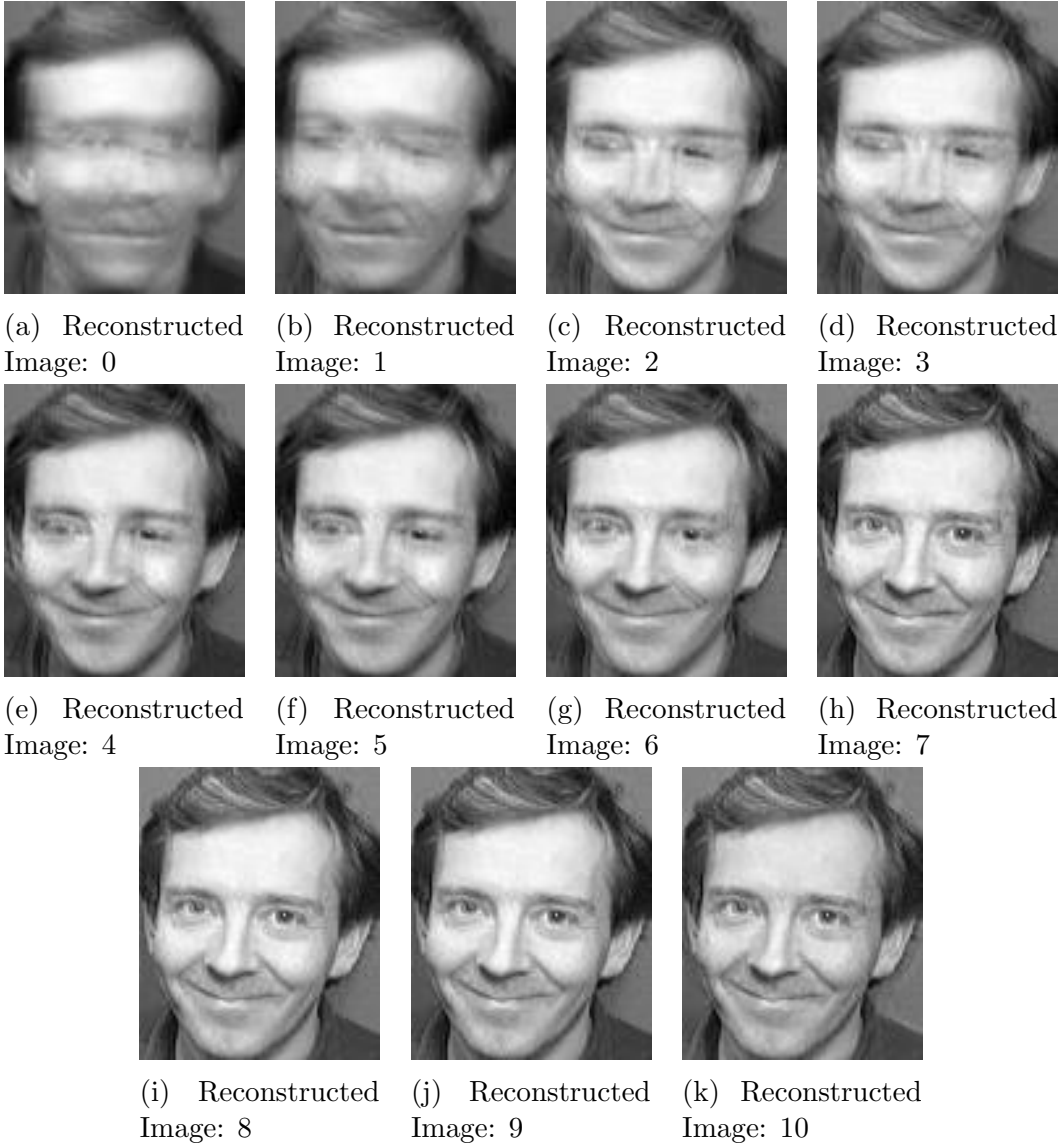


Figure 2: Partial reconstructions of image c.pgm in task 4.4

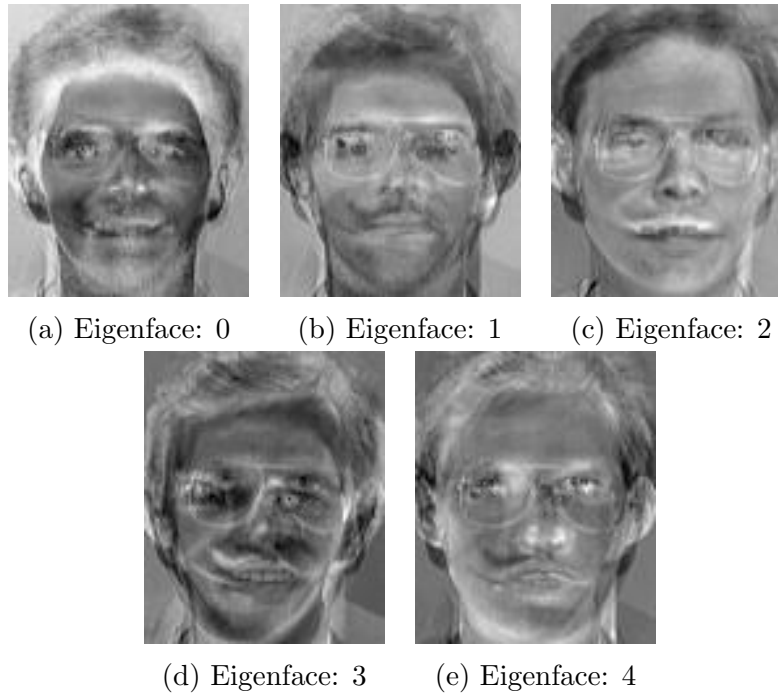


Figure 3: The eigenface images created in task 4.6

4 Task 4.6 Eigenfaces

fig. 3 shows the eigenface images we created in task 4.6. The figure comprises of 5 images, numbered from 0 to 4, since we plotted only principal components with non-zero eigenvalues (6 principal components existed in total as there were 6 images labelled from a to f, but one had a zero eigenvalue). Note that for partial reconstruction, we did not need to consider the principal component with zero eigenvalue, thus we did not plot the eigenface associated with the zero eigenvalue in this figure.

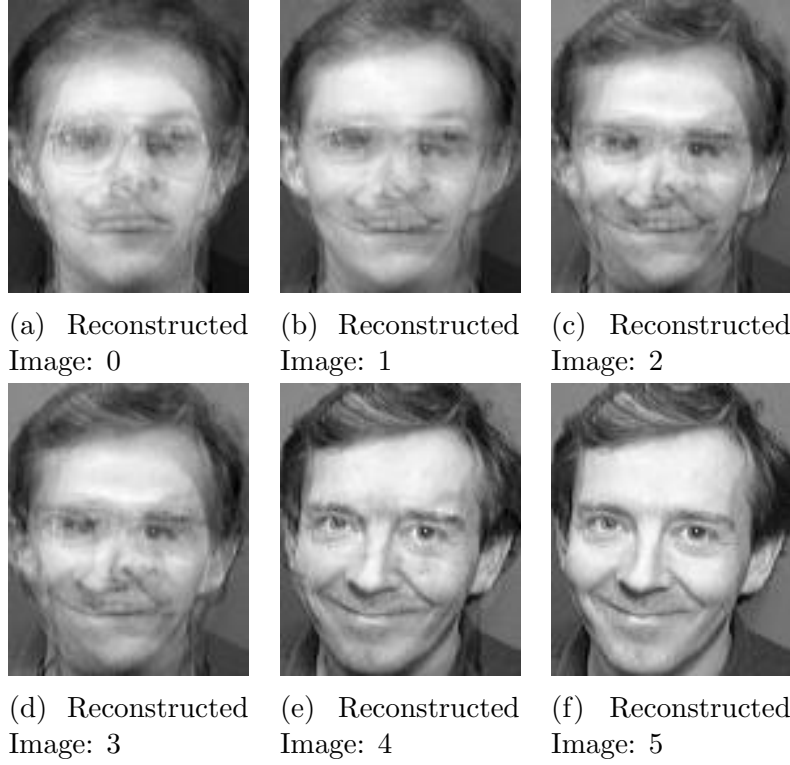


Figure 4: Partial reconstructions of image c.pgm in task 4.6

5 Task 4.6 Partial Reconstructions

fig. 4 shows the partial reconstructions of image c.pgm created in task 4.6. The first image (Reconstructed Image: 0) represents the mean image, whilst the i -th image (Reconstructed Image: i) represents the mean image plus all up to i -th principal component. There are 6 images in the figure since there are 5 principal components with non-zero eigenvalues.