1. The number of new dimension E is 35;

Here’s the bar graph for variance:



Top five eigen faces:









1. Here’s test accuracy using different number of eigenfaces:

|  |  |
| --- | --- |
| Number of eigenfaces | Error rate |
| 10 | 23.3333 |
| 20 | 20 |
| 30 | 20 |
| 40 | 20 |
| 50 | 20 |
| 100 | 16.6667 |

1. The error accuracy is 16.6667. It changed. The result is in some way out of my expectation since the reduced version of eigenfaces already contain over 90% information so it should be accurate. However, because we only have 30 test data so if there’s any expectations in that left 10%, it will cause a relatively big difference in accuracy (error rate). Actually there’s only one more misclassify than using all the spaces.

However, if I modify the number of eigenfaces to 100 or 120, the error rate will be the same as using the original dimension space.