Pattern Recognition Coursework 1

# Part 1

## Eigenfaces

Show and discuss the results, including: the eigenvectors, the eigenvalues, and the mean image, how many eigenvectors with non-zero eigenvalues are obtained and how many eigenvectors are to be used for face recognition

|  |  |
| --- | --- |
| Mean image |  |
| Eigenvalues against index |  |
| Eigenvectors with non-zero eigenvalues | 363 |

* Number of eigenvectors that gave best face recognition accuracy
* Is the optimal number in reconstruction point of view the best in recognition as well?
* What about efficiency?

Apply PCA to your training data, using the eigenvectors and eigenvalues of ATA. Show and discuss the results in comparison to the above, including: if the eigenvectors and eigenvalues obtained are identical, what the pros/cons of each method are. Show respective measurements

* ATA will take less time (show using tic toc comparisons of each)
* But this depends on whether D >> N
* Eigenvectors related by u=Av
* If D < N then this method may take longer cause got additional matrix multiplication