# Pattern Recognition: Assignment 1; Due date: 25/08/2013

## Eigen Decomposition and Singular Value Decomposition

1. Treat the given pictures as a matrix. Perform eigen value decomposition (if picture is rectangular – use $A^tA$). Reconstruct the matrix using the top $n$ eigen vectors corresponding to the top $n$ eigen values. Experiment with variable $n$. Display the reconstructed and error images for different values of $n$. Compute the Frobenius norm (Find out what this norm is) of the error picture. Write a report and submit.

2. Repeat the experiment using Singular Value Decomposition.

Note: The pictures are given as gif/jpg files. Convert to a bitmap before processing. : Please schedule an evaluation time with Asha/Lakshmanan (15 mins/student) on 26th starting from 9am. : Additional credit for experimenting with $n$ eigen vectors that are not necessarily from the $n$ eigen values.