

# Machine Learning 2007

## (Home work 3)

August 7, 2007

- Due on Monday, Aug 20, before 6 p.m.
- Late submissions will not be accepted.
- Submit hard copy of the results, plots and your workings
- Submit a printed copy of the codes also.
- You may save time if you use MATLAB for the computations and plots.
- Please do not hesitate to contact me if you do not understand the problems.

### 1. [15 points] Fuzzy c means Algorithm

- (a) Implement fuzzy c means. Apply the algorithm to find 2 clusters in the satellite image of Kolkata (i.e. use the same data as used in of Homework 2). Use  $m = 2$  as the fuzzifier. If a pixel has a membership between 0.4 to 0.6 in any cluster call that pixel as a mixed pixel. Show the mixed pixels.

### 2. [15 points] PCA

- (a) Find the two significant components of iris data using PCA. Plot the projected data in two dimension. You can use matlab for finding the eigenvalues and eigenvectors. Use  $k - nn$  to classify the projected data, compare the results with  $k - nn$  for the whole data. (For classification use a 100+50 training test partition as used before.)