Machine Learning (BITS F464)

Assignment 3

Submission Date:2355Hrs 18/11/2016

Naive Bayes Classifier

The task is classifying windows cropped from images as containing a face or not. This is a basic step in face detection, where a window is scanned over the image, and for each window location, the classifier has to answer the question of whether a face is present (binary classification).

The data file is provided to you and it contains training & test patches and binary labels, where 0 corresponds to '**non-face**' and 1 corresponds to '**face**'. The patches themselves are higher-resolution than the digit images, and each pixel value is either '#', corresponding to an edge being found at that location, or ' ', corresponding to a non-edge pixel.

- You have to train a Naive Bayes classifier that distinguish faces from non-faces. In your report, describe the accuracy, any interesting experimental settings (smoothing constant, etc.) and give the confusion matrix for this task, which should have four entries. Also show a few interesting examples of false positives (non-faces classified as faces) and false negatives (faces classified as non-faces).
- For this part of assignment you are not allowed to use any packages. You will have to develop using languages **C, C++** and **Java.**

Grading on the basis of:

1) The quality of algorithms developed.

2) Results.

3) Understanding of results.

4) Ability to reason for the derived results.

5) Final report and demo.

Report:

1. Describe about training the faces.
2. Mention the confusion matrix for this task.
3. Examples for false positives and false negatives.
4. Code.