ASSIGNMENT - 4

Training.

In training I have used a positive image set of 1000 images and negative image set of 1200 images from which patches are being detected.

Testing and Evaluation

For testing I have tested it for 100 positive images and 100 negative images. I have evaluated the model for same number of positive and negative images.

Few of the positive and negative patches are shown below:

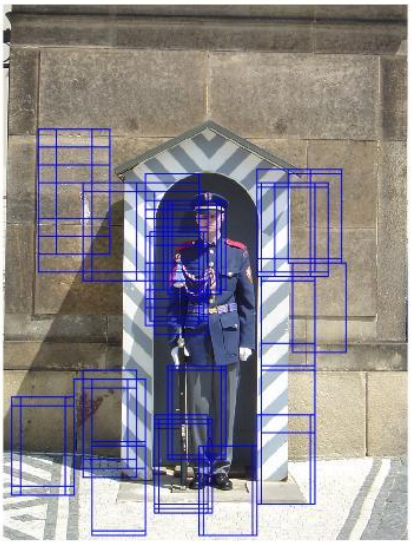
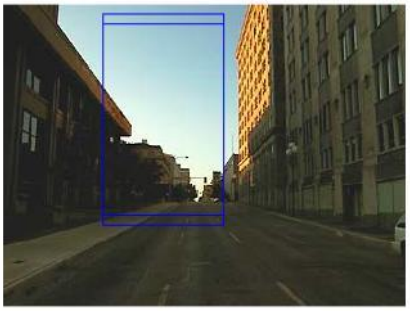


Fig 1. : Positive image patches

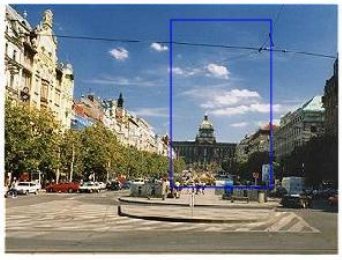
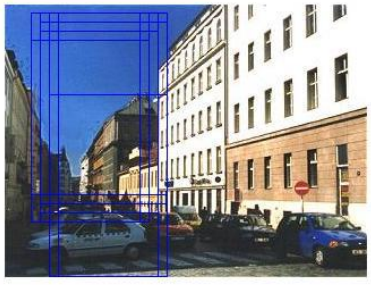





Fig 2. : Negative Image Patches.

I am using 4 level in scale space and each time it is reducing the image size by 1/2. In resolution scale also I am using 4 level and here also it is getting reduced by a factor of 1/2.

The detector window is of size 96X160.

The HOG features in each resolution is as follows:

resolution = 1 ; number of features = 7440
resolution = 1/2 ; number of features = 3224
resolution = 1/4 ; number of features = 1860
resolution = 1/8 ; number of features = 868

Results.

The accuracy is ~80%

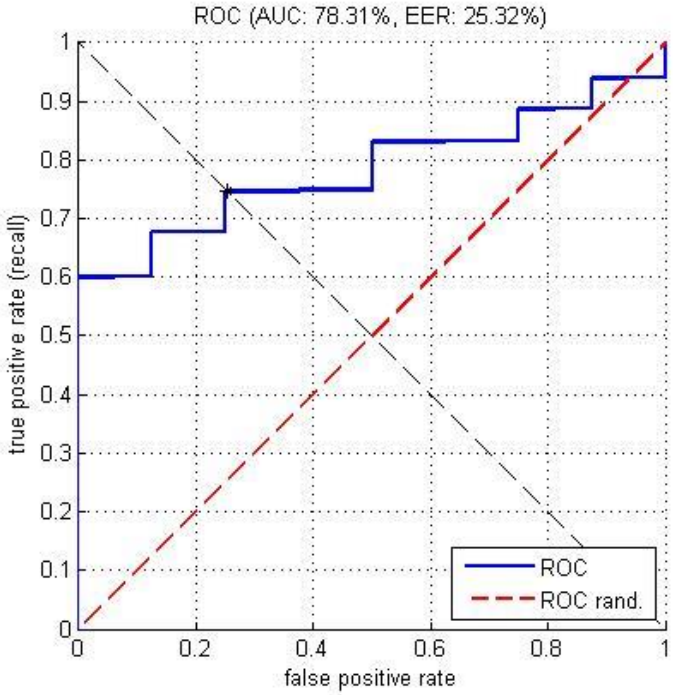


Fig 3: ROC plot

Key Observations:

- The model is also detecting features like shadows, picture of people, statues.
- The model created using 'libsvm' library has more accuracy than model trained 'vlfeat'.

Folder Structure:

10 positive and 10 negative images the result images are stored in 'resultImage' folder. 'objectTraining.m' file is the file used for training the model. 'objectDetection.m' is the file used for testing and detection. 'evaluation.m' is the file used to generate the ROC plot. 'w1.mat' and 'b1.mat' are the matrices used to store the outputs of vl_svmtrain() for all the four resolutions.