Human Detection

Part A

Implement Histogram of Orientated Gradients (HOG) as explained in Lecture 6.

Download INRIA Person Dataset from: http://pascal.inrialpes.fr/data/human/.
The dataset consists of positive and negative examples for training as well as testing images.

i. Take positive training images from: ./INRIAPerson/train_64x128_H96/pos

ii. Take negative training images from: ./INRIAPerson/Train/neg

iii. Compute HOG for positive and negative examples.

iv. Show the visualization of HOG for some positive and negative examples as shown at slide 79 of Lecture 06.

Due October 23

Part B

Implement Support Vector Machine (SVM) using Quadratic Programming.

i. Try to understand each input term in Matlab built-in Quadratic Programming function ‘quadprog’.

ii. Formulate soft- margin primal SVM in term of inputs of ‘quadprog’

iii. Show your ‘H’, ‘A’ and ‘f’ Matrices.

iv. Obtain parameter vector ‘w’ and bias term ‘b’ using ‘quadprog’.

Due October 30
Part C

Detect Human in testing images using trained model (‘w’, ‘b’) from Part B.

i. Take at least 5 testing images from ./INRIAPerson/Test/pos.

ii. Test your trained model over testing images. Testing can be performed using $w \times \text{feature vector} + b$.

iii. Use sliding window approach to obtain detection at each location in the image.

iv. Perform non-maximal suppression and choose the highest scored location.

v. Display the bounding box at the final detection.

Due November, 6

Deliverables:

1. Report including Input and Output images (Soft Copy)
2. Code (Soft copy)

Please send your assignments by email to wagas5163@gmail.com. Please use Assig_3_CAP541514 as subject of the email.

Note: Please write some instructions about how to run your code.