

CAP5415 Computer Vision Fall 2014

Programming Assignment # 3

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 $w \cdot \text{feature vector} + b$.
- 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 waqas5163@gmail.com. Please use Assig_3_CAP541514 as subject of the email.

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