Assignment 8

This week we had two milestones and several tasks within them. We have performed some of them and the details regarding it along with its links are given below.

MileStone 1:
HPU baseline:-
As mentioned in the assignment we made the HPU interface which is used to draw bounding boxes around all cars in the dataset. We get the coordinates of bounding box drawn by the HPU around cars in CSV format. The cost defined as the total number of seconds it takes for human to draw bounding box was calculated as X-axis parameter. The link to the HPU data collected from 170 car images in CSV format is here. Images are listed row wise and co-ordinates of top left corner and bottom right corner are written column wise as top-left (x1,y1), bottom right (x2,y2). Last column containing the cost (time) required to complete this task is specified in seconds. The time is measured from loading of the image till saving the image with bounding boxes. The code for our HPU is here.

CPU:
We have tried implementing the LBP, Haar and HOG. We used the Haar Cascade classifier from OpenCV for detecting cars from the dataset. We have generated a .csv file for CPU also like the one we created for HPU so that we can analyse both of them and come up with accuracy and ROC curves. We trained our own cascade but due to limited computation power we were able to train only upto fourth stage and have less accuracy in detection as expected. You all can try the code on the 170 images from the dataset from here

CPU Bounding Boxes:-

The coordinates of bounding boxes generated by the CPU algorithm can be found here. The accuracy of the CPU algorithm isn't that good as the Haar classifier was trained only upto four stages over the given dataset. We wish to improve the accuracy of the classifier over next week by adding multiple stages and more feature detectors.

CPU vs HPU

We used IPython Notebook to compared the bounding boxes using CPU and HPU. The left column is the bounding boxes by CPU and the right column is by HPU.

Milestone 2:

We had to perform some CPU+HPU hybrid experiments for this milestone, however the training of cascade classifier took a lot of time and were not able to integrate the CPU and HPU data in the above web application but we are working on it.