

CVIP Project 3

Task1 report

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Face detection task is to identify the human faces in the given image. This task is performed by using classifiers. The classifier decides whether a given image has a face or not respectively positive or negative. This is performed by a set of weak classifiers which combine with their respective weights to produce a final classifier. This is known as Boosting Algorithm. Initially every classifier is initialized with equal weights, then taking set of filters on every part of the image (equal to the window size), the weights get updated based on the threshold for each filter. Then we need to select best filter and threshold combination. This is known as the Cascade classification because it rejects the non-face region saving the computation time.

Implementation using Open CV:

OpenCv has pre-trained classifier named Haar classifier for face detection. Open CV has 'haarcascade_frontalface.xml' for face detection in xml format which can be downloaded and used for the task. It has detectMultiscale module in the classifier. This function will return a rectangle with coordinates(x,y,w,h) around the detected face. It has two parameters which are to be tuned for the task.

Scalefactor:

In an image there may be many faces and some faces may be near to camera and some may be far from the camera. The faces near to camera may dominate the other faces. So, by the Scalefactor we can overcome this issue.

Minimum Neighbors:

This specifies the number of neighbors a rectangle should have to be called a face.

The coordinates obtained for every image are dumped into json file.

I have achieved F1 score as 0.789 for the given validation set of images for scalefactor as 1.1 and min neighbors as 4 and with the same parameters it is implemented on test set images.