AHSANULLAH UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of CSE

EYE DIRECTION DITECTION

Section: B

Group: B-1

Submitted To

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Problem Description

Eye Direction Detection is basically a part of human life because while we talk with other person we have to eye contact with them. Without that in case of suspicious movement one basic symptom is frequently movement of iris. So, for identifying that one have to detect the eye first and then the direction of that eye.

This paper is concerned with the reliable detection and detection of Eye and its direction.

Dataset Description

Eye Direction Detection from image

1. Number of instances: There are total 5 images containing face.
2. Dimensions: The dimension of each images are 1000 x 1500, 2250 x 1500, 3642 x 3344, 1000 x 1500, and 1000 x 1500.

Description of the Process

There are various ways to detect the direction that one person is looking at. First of all, we took an input image, then made a gray scale image. Then we have applied Viola Jones Method which crop out the pair of eyes from a particular picture. Then we applied Hough transformation method which crop out a single eye from the pair of eye. Finally we have calculated the distance from the center of the pupil to identify whether the person is looking at right or left. If not then the person is described as he's staring straight.
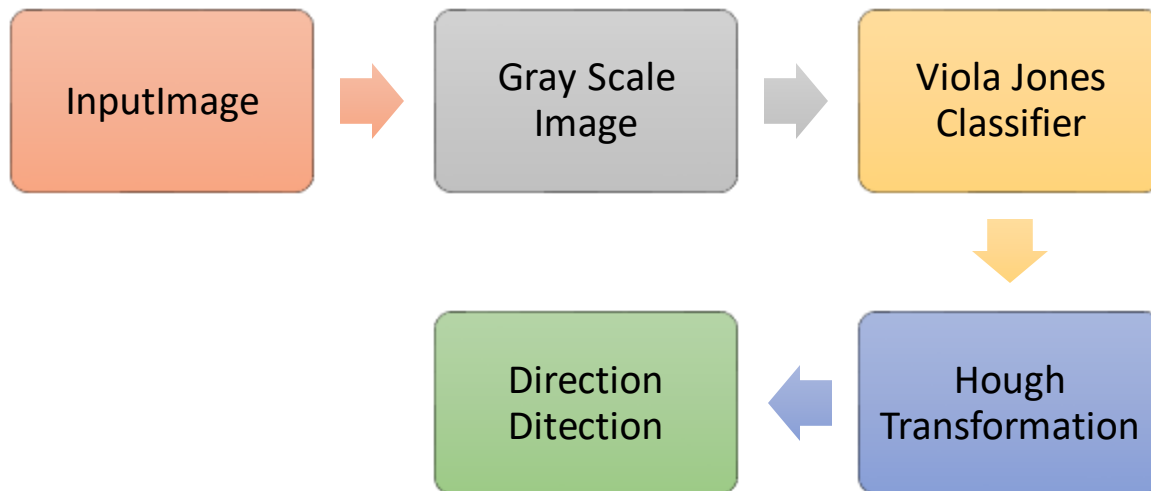
FLOW CHART

Figure 1: Eye Direction Detection

Process

Input Image:

We have taken High resolution input of images.

Gray Scale image

A grayscale (or gray level) image is simply one in which the only colors are shades of gray. The reason for differentiating such images from any other sort of color image is that less information needs to be provided for each pixel. We have used rgb2gray function for this process.

Viola Jones Classifier:

The algorithm has four stages:

1. Haar Feature Selection
2. Creating an Integral Image
3. Adaboost Training
4. Cascading Classifiers

Haar Features

- The eye region is darker than the upper-cheeks.
- The nose bridge region is brighter than the eyes.

Cascading Classifiers

- On average only 0.01% of all sub-windows are positive (faces)
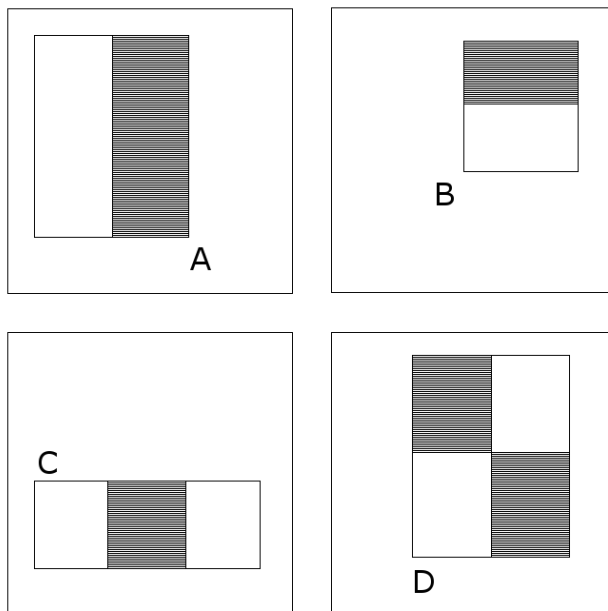- Equal computation time is spent on all sub-windows

Fig : Viola Jones Kernel

Hough Transformation:

- First, we create the accumulator space, which is made up of a cell for each pixel. Initially each cell is set to 0.
- For each edge point (i, j) in the image, increment all cells which according to the equation of a circle could be the center of a circle. These cells are represented by the letter in the equation.
- For each possible value of found in the previous step, find all possible values of which satisfy the equation.
- Search for local maxima in the accumulator space. These cells represent circles that were detected by the algorithm.

Direction Detection:

- We have taken the center of Iris.
- From the center we have calculated the distance of left and right from the center.
- Finally checking whether left distance is bigger than right or right distance is bigger than left.
- If left distance is larger than right then we declared the person is staring at right and vice versa.
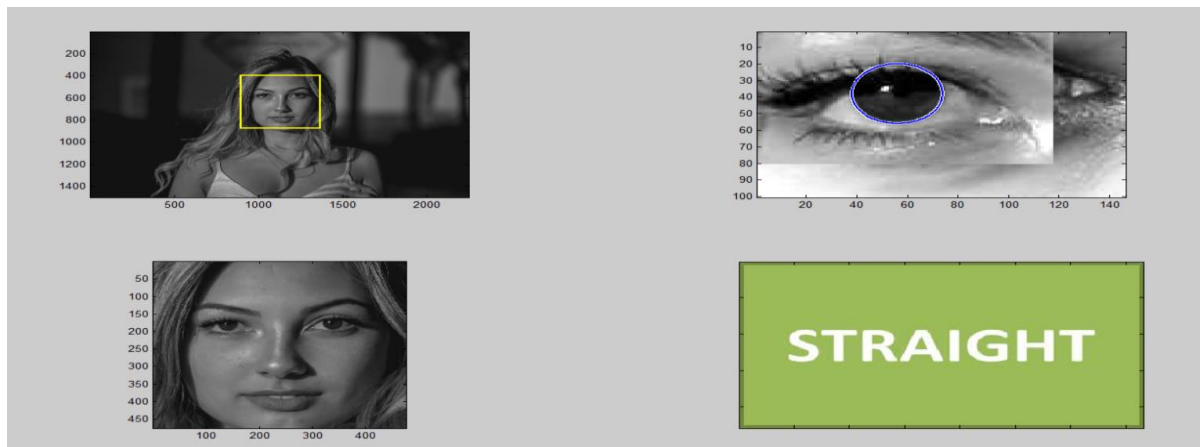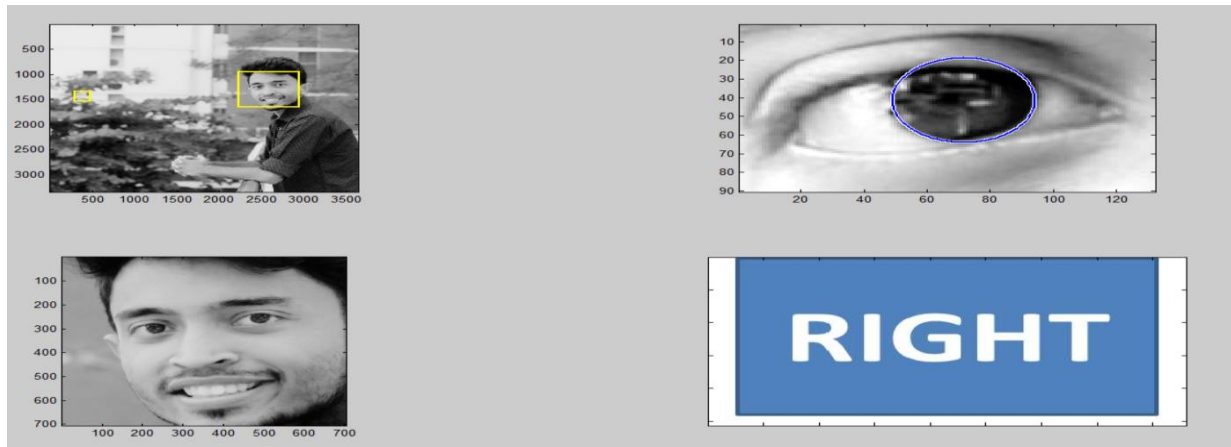
Screenshot:

Figure: Eye Direction (Straight)

Figure: Eye Direction (Right)

Figure: Eye Direction (Left)

Project Contribution:

We have completed the task together.

Discussion

The goal of this project is to identify the direction of the eye. We have successfully identified the direction. We have also spotted if the person is staring at straight. Finally we have plotted all the images.