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Prevention Of Accident Due To Drowsiness

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***Abstract*— Fatigue and drowsiness of driver are amongst the most important cause of road accidents. The main aim of the project is to find out the methods to detect driver drowsy condition and alerting them hence increasing the transport safety. By using many body and facial gestures as a sign of driver fatigue, detection including yawning, eye blinking, and eye movement, these condition indicate that driver is not in proper driving condition. In this proposed system yawning and eye detection are used. Driver fatigue can increase the chances of car accidents. The reason for this kind of car accidents are due to the fact that driver fails to take necessary actions prior to the collision occurs, therefore using this system which will monitor the behavior of driver and also will give the necessary alerts to the driver which will prevent the road accidents.**

***Keywords*—Accident,drowsiness,fatigue,monitor.**

I. INTRODUCTION

The advance of computing technology has provided the means for constucting intelligent vehicle systems. Drowsy driver detection system is one of the potential applications of intelligent drowsy detection systems. Uncontrolled sleepiness results in an increased risk of motor vehicle crashes primarily because the driver either fall in sleep while driving or experiences reduced attention to road events and the driving task due to fatigue. Survey show that 20% of all the traffic accidents are due to drivers drowsiness. Furthermore, accidents related to driver awareness are more serious than other types of accidents, since sleepy drivers often do not take correct or secure action prior to a collision. For this reason, developing systems for monitoring driver's level of vigilance and alert the driver, when he is in drowsy state and not paying adequate attention to the road, is essential to prevent accidents. The prevention of such accidents are major focus of effort in the field of active safety research.

People in fatigue indicate some visual behaviors easily observe from changes in their facial features like eyes, head, mouth and face. Computer vision could be a natural and non-intrusive technique to monitor driver's vigilance. Faces are the important part to be consider while giving any decision regarding drowsiness which has been a research target in computer vision for a long time. Automatic recognition of facial behavior or expression consists of three levels of tasks: face detection, facial expression or behavior information extraction, and expression classification. It involves detection, identification and detecting facial feature points under different illuminations, face oriented and facial expressions.

The critical issue that a fatigue tracking system must address is the question of how to accurately and early detect fatigue at the initial stage. For detecting fatigue in drivers using computer vision are, based on eye blinking and eye movements, based

on head movement, methods based on mouth opening. In this system, the driver's face is taken as an input from camera. We could then detect the location of the eyes and the mouth on the input image. The mouth geometrical features are then use to detect the yawn. Then system will generate the alert sound or buzzer to the driver about their drowsiness and the improper driving state in case of drowsy state is detect.

II. LITERATURE SURVEY.

a). Face detection.

In this face detection method we generally detect face by continuously read frame or take input frame from camera [6][7][8]. For this there are two most reliable algorithm is present in MATLAB. The first is Viola Jones algorithm and second is KLT (kanade lucas tomsai) algorithm. In both algorithm work is same but difference between them is efficiency and reliability. These algorithm do following things,

1. Detect face.
2. Identify facial feature to track.
3. Track the face.

Here, KLT algorithm is more efficient than Viola jones algorithm, but KLT is a little bit complex. So most of the people refer to use Viola jones algorithm.

b). Eye-Blinking Detection.

In this eye blinking rate and eye closure duration is measured to detect driver's drowsiness. Because when driver felt sleepy at that time his/her eye blinking and gaze between eyelids are different from normal situations so they easily detect drowsiness[10].

And in this type of system uses a remotely placed camera to acquire video and computer vision methods are then applied to sequentially localize face, eyes and eyelids positions to measure ratio of closure[2].

c). Yawning Detection.

Detection of drives' drowsiness based on yawning measurement. This involves several steps including the real time detection and tracking of driver's face, detection and tracking of the mouth.

It measure the mouth opening vertically while yawning,if it crossed it threshold value than we can said driver in drowsiness state[3].

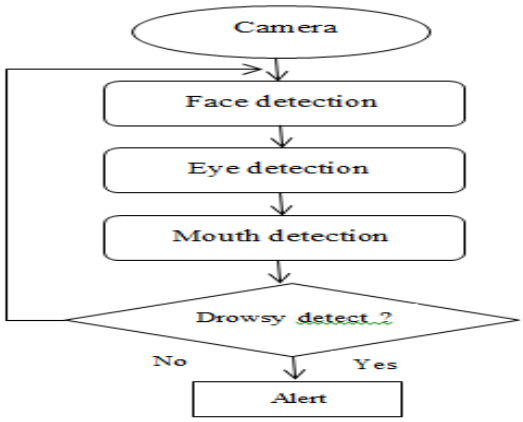
III. IMPLIMENTATION

From referring the literature survey we use three method for developing project, face detection, Eye blinking detection, Yawning detection.

First we use Viola Jones algorithm for face detection. Below is algorithm, we know KLT is better but simplicity we use Viola jones algorithm, which we refer from MATLAB mathwork site.

```
% Create a cascade detector object.
faceDetector = vision.CascadeObjectDetector();
% Read a video frame and run the face detector.    videoFileReader = vision.VideoFileReader('tilted_face.avi');
videoFrame = step(videoFileReader);
bbox  = step(faceDetector, videoFrame);
% Draw the returned bounding box around the detected face.
videoFrame = insertShape(videoFrame, 'Rectangle', bbox);
```

```
figure; imshow(videoFrame); title('Detected face');
 % Convert the first box into a list of 4 points.
 % This is needed to be able to visualize the rotation of the object.
 bboxPoints = bbox2points(bbox(1, :));
```



Above is Flowchart of whole project.

Second we use eye detection technique. Normally person blink there eyes 12-15 times in minute, but drowsy person blink there eye 5- 10 times. So we set threshold value in eye detection [1][2].

Third Yawning detection we also set threshold value .If mouth open certain limit that we set than system detect that person is in drowsy state. After detecting drowsy state person alert by alarm or sound[3].

Normally the image is in RGB form. But in rgb picture we can not detect perfectly face, eye and mouth. So there is need to convert this image into grayscale. The reason behind this is intensity level of grayscale image is more than rgb image [4]. This we can show in our result image.

IV. RESULT

We take some Picture of our result, that show our work on project.

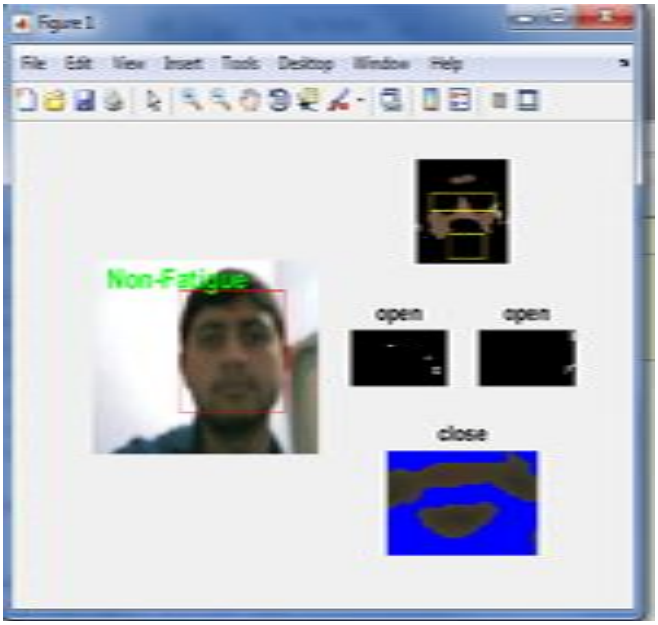


Fig – 1 Detect face and mouth and show eyes open or not.

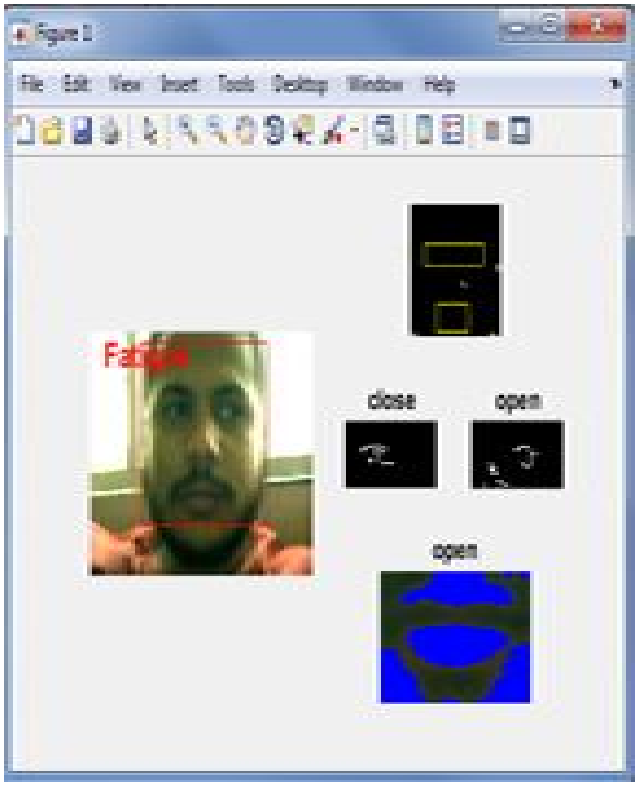


Fig – 2 Detect face and mouth and show eyes open or not.

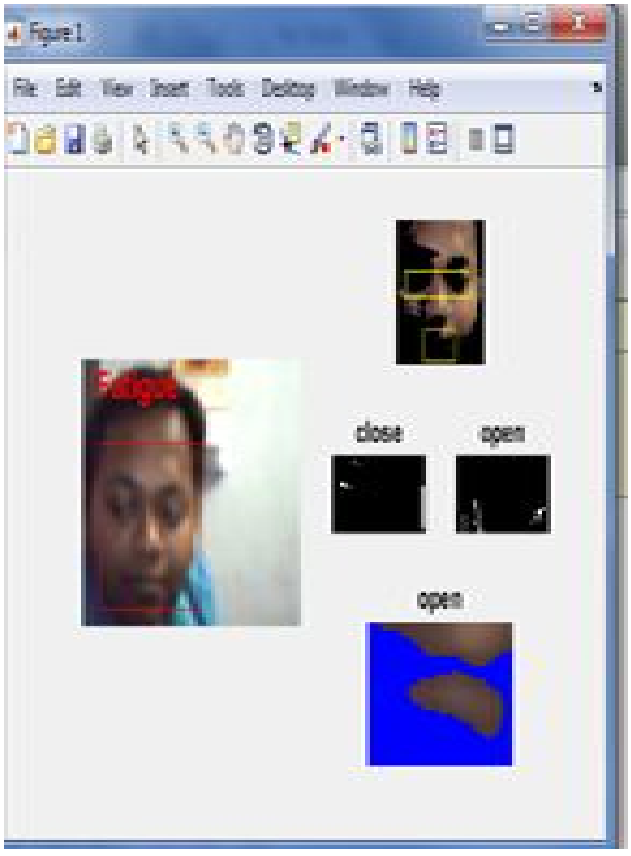


Fig – 3 Detect face and mouth and show eyes open or not

V. CONCLUSION

Now a day's road accident increase due to driver's fatigue situation or drowsy condition. For the purpose of reducing accident we decided to develop this system. In this system with the help of camera face of driver is detected after that calculation of the eye map and mouth map will be performed. For any input image from camera it will check the eye blinking rate and mouth opening and closing ratio for specific time interval. If this ratio and eye blinking rate are found more than normal situation, than this system conclude that driver is in drowsy state. It will alert the driver by alarm or buzzer for wake up. This system will help in increase the safety of driver. This system will help in reducing accident due to drowsiness.

VI. FUTURE SCOPE

As we know there is always a scope for further improvement same thing will be applicable over here. There is vast scope for this system of drowsiness detection. As there are several signs by which we can say the person is feeling drowsy. To detect the drowsiness several alternatives are available like eye detection, Iris detection, pupil detection, and yawing detection. Out of these options proposed system uses yawning and eye detection for drowsiness detection. For making the system more strong and efficient one can check the two different behavior together so chances of false identification may reduce. This system can be introduced in an organization like security system, road transport, importantly at check post.

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