

# CAR ACCIDENT PREVENTION SYSTEM

Dipak Bodare<sup>1</sup>, Mahesh Ranmode<sup>2</sup>, Prativind Ghogare<sup>3</sup>

Prof.P.S. Togrikar

prativindghogare@gmail.com Contact No: 9503090351

**Abstract:-** Driver in-readiness is an imperative reason for most mischance identified with the vehicles crashes. Driver exhaustion coming about because of genuine slumber is an imperative consider the expanding number of the mischances on today's streets. Tired driver cautioning framework can structure the premise of the framework to perhaps decrease the mischances identified with driver's laziness. The reason for such a framework is to perform discovery of driver weakness. By setting the cam inside the car, we can screen the substance of the driver and search for the eye-developments which show that the driver is no more in condition to driver is no more in condition to drive. In such a case, a notice sign ought to be issued. This framework depicts how to discover and track the eyes.

At the time of eyes following we separate out left and right eyes some piece of casing, at the genuine begin of laziness location process we must spare the any human eyes format as a standard. Presently we contrast caught eyes outline with our standard human eye layout. At that point if both edges are coordinated with our conditions, i.e.<1>if driver is a regular human conditions then our framework will gives a message (Diver is alert).<2> If driver is a sluggish condition i.e. we escape 3 frame out of 10,casings are consistently shut or coordinated with our shut standard format.

In this proposed system we have work on different angle of tilt face image and we observed that at least single eye can be detected and using this any one single eye system can work 80% more accurately.

**Keyword:** - viola and jones algorithm, Face detection, Eyes detection, left eye Detection, right eye Detection, Drowsiness alert, Buzzer.

## Introduction:-

Safe driving is a significant concern of social orders everywhere throughout the world [2]. A great many individuals are murdered, or truly harmed because of drivers falling as slumber at the wheels every year. Late studies demonstrate those drivers' sleepiness represents up to 20% of genuine or deadly mishaps on motorways and dreary streets, which impede the drivers' judgment and their capacity of controlling vehicles [1]. In this manner, it is key to build up an ongoing wellbeing framework for laziness related street mischance anticipation. Numerous techniques have been produced and some of them are presently being utilized for distinguishing the driver's languor, including the estimations of physiological highlights like EEG, heart rate and heartbeat rate, head development and practices of the vehicle, for example, path deviations and guiding developments [3]. Among those distinctive innovations, visual measures, for example, eye-flickering and eyelid conclusion are considered as encouraging routes for checking readiness. Normally, after extend periods of time of driving or in truant of alarm mental state, the eyelids of driver will get to be substantial because of exhaustion.

The consideration of driver begins to lose center, and that makes dangers for mischances. These are commonplace responses of weakness, which is exceptionally perilous. Typically numerous depleted drivers are not mindful that they are in nodding off [6]. Actually, numerous such drivers can nod off whenever amid their driving.

## Objective:-

- The Focus Of This Undertaking Is To: To Lay Out A Structure To Perceive Driver's Tiredness In Perspective Of Face And Eye Recognizable Proof In The Region Of Variable Lighting Conditions So That Road Incidents Can Be Stayed Far From Adequately
- To Alert The Driver On Id Of Tiredness By Using Beep Or Signal And To Ensure A Direct And Profitable Blueprint, That Can Be Completed Using Diversion And Hardware Likewise Without False

## Definition of simple features for object detection:-

3 rectangular feature types:

- two-rectangle feature type (horizontal/vertical)
- three-rectangle feature type
- four-rectangle feature type

Using a 24x24 pixel base detection window, with all the possible combination of horizontal and vertical location and scale of these feature types the full set of features has 49,396 features.

The motivation behind using rectangular features, as opposed to more expressive steerable filters is due to their extreme computational efficiency.

### A variant of AdaBoost for aggressive feature selection:

- User selects values for  $f$ , the maximum acceptable false positive rate per layer and  $d$ , the minimum acceptable detection rate per layer.
- User selects target overall false positive rate  $F_{target}$ .
- $P$  = set of positive examples
- $N$  = set of negative examples
- $F_0 = 1.0; D_0 = 1.0; i = 0$
- While  $F_i > f_{target}$
- $i++$
- $n_i = 0; F_i = F_{i-1}$
- while  $F_i > f \times F_{i-1}$ 
  - $n_i ++$
  - Use  $P$  and  $N$  to train a classifier with  $n_i$  features using AdaBoost
  - Evaluate current cascaded classifier on validation set to determine  $F_i$  and  $D_i$
  - Decrease threshold for the  $i$ th classifier until the current cascaded classifier has
  - a detection rate of at least  $d \times D_{i-1}$  (this also affects  $F_i$ )
- If  $F_i > T_{target}$  then evaluate the current cascaded detector on the set of non-face images and put any false detections into the set  $N$ .

### Block Diagram:-

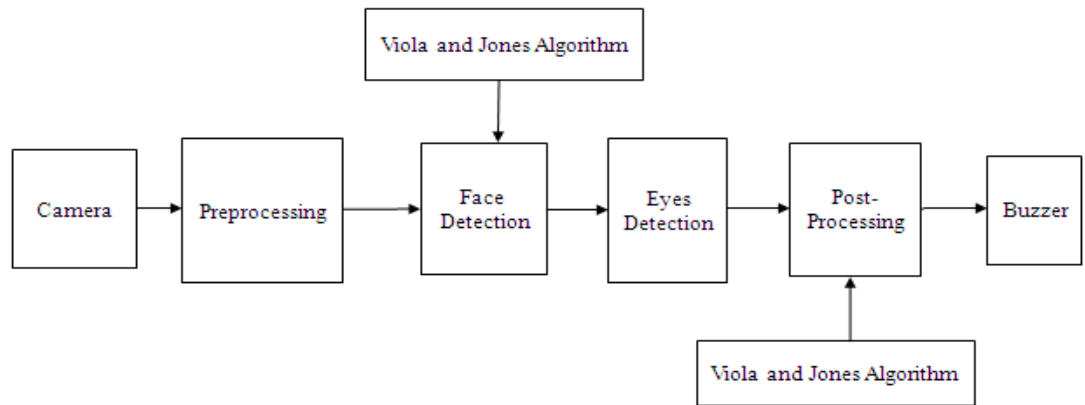


Fig: - Block Diagram of car accident prevention system.

### Operation of the face detector:-

Face detection is a computer technology that determines the locations and sizes of human faces in Digital images. It detects face and ignores anything else, such as buildings, trees and bodies. Face Detection can be regarded as a more general case of face localization. In face localization, the task is to find the locations and sizes of a known number of faces (usually one) [7]. In face detection, face is processed and matched bitwise with the underlying face image in the database.

### Face detection algorithm:-

- PCA (principle component analysis).
- Dynamic Template matching.
- Color skin model.
- Viola jones algorithm.
- KLT algorithm.

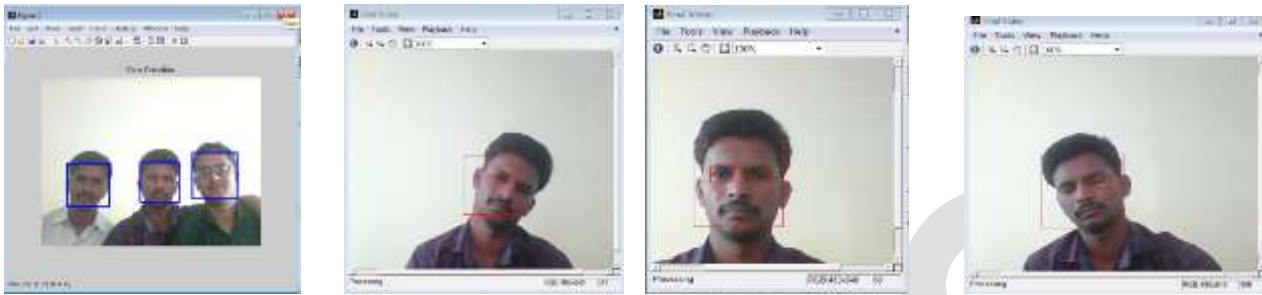


Fig:-Multiple Face Detection.

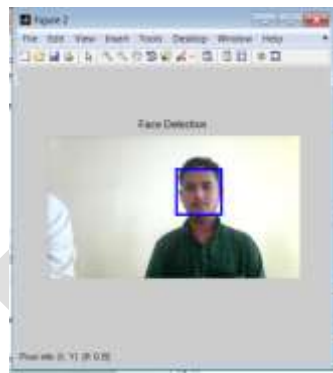


Fig:-Face Detection.

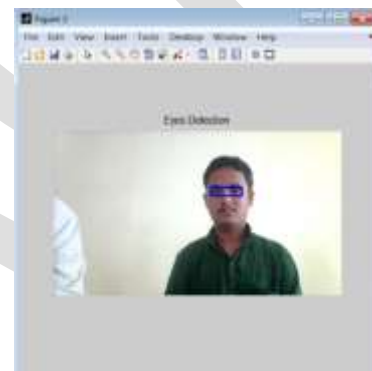


Fig: - Eyes Detection.

### Viola jones algorithm:-

Paul Viola and Michael Jones presented a fast and robust method for face detection which is 15 times quicker than any technique at the time of release with 95% accuracy at around 17 fps. This work has three key contributions:

- Haar-like features
- Integral image
- AdaBoost Learning algorithm
- Cascade Classifiers.

### Haar-like features:

- Each Haar-like feature consists of two or three connected “black” and “white” rectangles.
- Each feature results in a single value which is calculated by subtracting the sum of pixels under white rectangle from the sum of pixels under black rectangle.

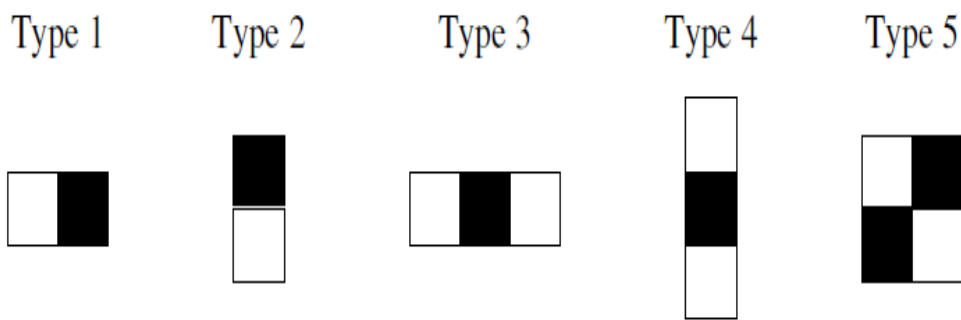


Fig:-Haar features used in viola Jones

### Integral image:

- Integral image allows for the calculation of sum of all pixels inside any given rectangle using only four values at the corners of the rectangle.
- In an integral image the value at pixel (x,y) is the sum of pixels above and to the left of (x,f)

Sum of all pixels in

$$D = 1+4-(2+3)$$

$$= A+(A+B+C+D)-(A+C+A+B)$$

$$= D$$

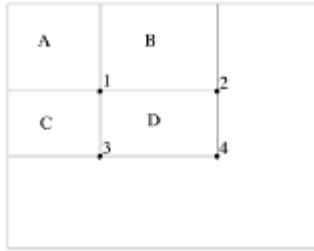


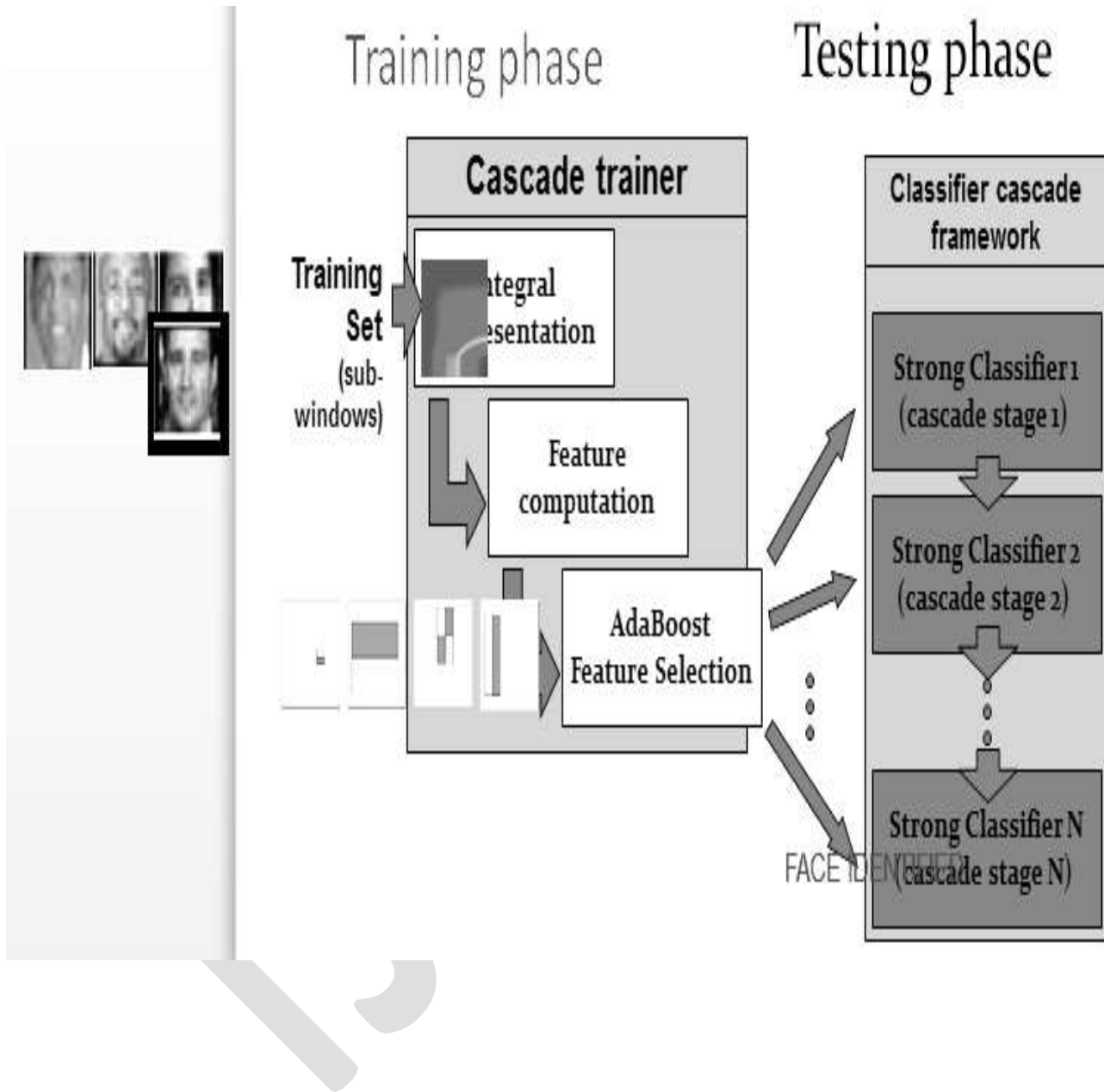
Fig: - Integral image matrix

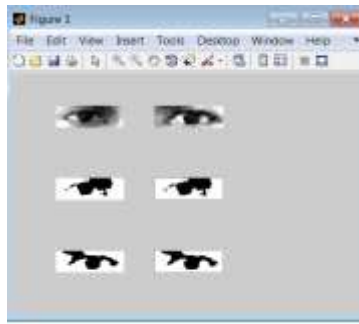
### AdaBoost Learning algorithm:

- As stated previously there can be approximately 160,000 + feature values within a detector at 24x24 base resolution which needs to be calculated. But it is to be understood that only few set of features will be useful among all these features to identify a face.
- AdaBoost is a machine learning algorithm which helps in finding only the best features among all these 160,000+ features. After these features are found, a weighted combination of all these features is used in evaluating and deciding any given window has a face or not.

### Cascade Classifiers:-

- For fast processing, the algorithm should concentrate on discarding non-faces quickly and spend more on time on probable face regions.
- Hence a single strong classifier formed out of linear combination of all best features is not a good to evaluate on each window because of computation cost.
- Therefore, a cascade classifier is used which is composed of stages each containing a strong classifier. So all the features are grouped into several stages where each stage has certain number of features.
- Each stage determines whether a given sub window is definitely not a face or may be a face. A given sub window is immediately discarded as not a face if it fails in any of the stage.





Left eye open



Left eye close



Half-Left eye open



Half-Left eye close



Right Eye Open



Right Eye Close



Half-Right Eye Open



Half-Right Eye Close

Fig: - Templates of eyes open and closed.



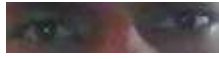


Fig:-Open Eye Strip

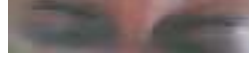


fig:-closed eye strip

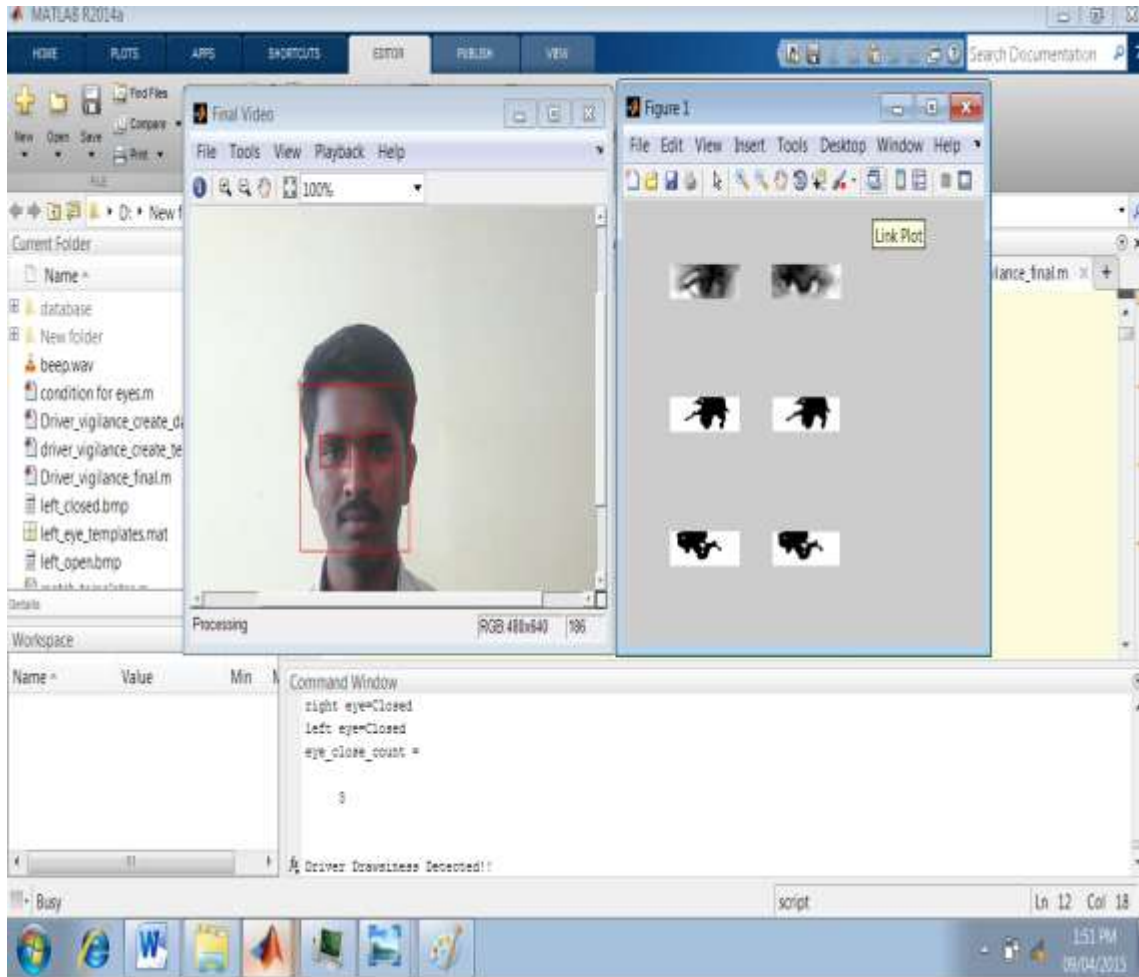


Fig:- Proposed system

### Acknowledgement:-

We have incredible joy in conveying the report on the point "Car Driver Drowsiness Alert System". This paper has help me to express my appreciation towards Honorable Principal Dr. P. D. Nemade for his backing. Likewise, we might want to because of HOD Prof. A. C. Bhosale for their constant help and backing.

We might want to because of our Project-Guide Prof. P. S Togrikar for their convenient help and direction towards effective fulfillment of our paper.

Our earnest on account of all showing and non-showing staff of our specialty for their consistent collaboration stretched out to me to finish the undertaking effectively. Our gratitude to all my companions for their steady help and backing amid our venture work.

## Conclusion:-

We developed a system that localizes and track the FACE and EYES movements of the driver in order to detect drowsiness. The system uses a combination of template – based matching and feature based matching in order to localize the eyes. During tracking, system will be able to decide if the eyes are open or closed and whether the driver is looking in front. When the eyes will be closed for too long, a warning signal will be given in the form of buzzer.

## REFERENCES:

- [1] A. K. Jain, “*Fundamentals of Digital Image Processing*”, Prentice Hall of India, First Edition, 1989.
- [2] “*Real-Time Detection of Driver Fatigue using DIP*” “Suvarna Pathade, Vinaya Gohokar International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-1, Issue-3, August 2012
- [3] “*Road Accidents Prevention system using Driver’s Drowsiness Detection*” Garima Turan, Sheifali Gupta International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 2, Issue 11, November 2013
- [4] “*Vision-based Real-time Driver Fatigue Detection System for Efficient Vehicle Control*” D.Jayanthi, M.Bommy International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-2, Issue-1, October 2012
- [5]. K. S. Srinivasan and D. Ebenezer, “*A New Fast and Efficient Decision-Based Algorithm for Removal of High-Density Impulse Noises*,” IEEE Signal Processing Letters, Vol. 14, No. 3, March 2007.
- [6]. H. Hwang and R. A. Haddad”*Adaptive Median Filters: New Algorithms and Results*” IEEE Transactions on image processing vol 4. P.no 499-502, Apr 1995.
- [7]. Suresh Kumar, Papendra Kumar, Manoj Gupta, Ashok Kumar Nagawat, “*Performance Comparison of Median and Wiener Filter in Image De-noising*” ,International Journal of Computer Applications (0975