Volume 3, Issue 4, April-2016, pp. 197-198 ISSN (O): 2349-7084

International Journal of Computer Engineering In Research Trends

Available online at: www.ijcert.org

Real Time Detection System of Driver Fatigue

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Abstract:-The leading cause of vehicle crashes and accidents is the driver distraction. With the rapid development of motorization, driver fatigue has become a very serious traffic problem. Reasons for traffic accidents are driving after alcohol consumption, driving at night, driving without taking rest, aging, sleepiness, and fatigue occurred due to continuous driving, long working hours and night shifts. So to reduce rate of accidents due to above reasons, is aim of this project. This paper presents a method for detection of early signs of fatigue using feature extraction, Haar classifier and delivering of information and whereabouts of the driver to the emergency contact numbers.

Keywords – Feature extraction, Haar Classifier, Fatigue, Accident Prevention, Driver Distraction

1. INTRODUCTION

The objective of the study will be the design of a system which could monitor the conditions of the driver in order to determine the alert and attention levels. The main goal of this paper is to present a real time system to detect and classify driver distraction applying blob analysis, Haar Classifier, etc. and using images of the driver and his voice as the input. This is a complex phenomenon that implies a decrease in alerts and conscious levels of the driver. It is no possible measure it up with direct method, but it can derive from visual features (movement, expression)[1]. In our system, firstly we will be using OpenCV Technology to capture continuous images of the driver. By using the algorithms viz. Blob analysis, Feature extraction, Yawning Detection Algorithm, analysis of the expressions on the driver's face is done. In the analysis, the stress level on the driver's face is determined. Based on the analysis, if the stress level is more, then alert messages are sent to the emergency contact numbers of the driver and to the driver himself. In case of any accident scenario, if the driver says a word "Help", alert messages are sent again to his emergency contact numbers.

2. OVERVIEW OF STRESS DETECTION

The stress/fatigue/drowsiness is very vague concepts. These terms refer to a loss of vigilance while driving. Indicators of fatigue can be found in:

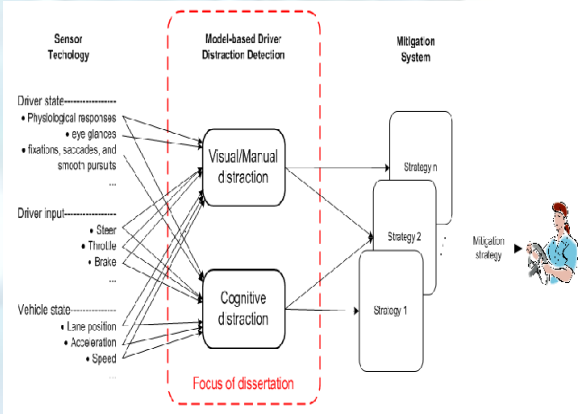

Fig.1 System Architecture

2.1. VISUAL FEATURES

The quantitative study related with this area are based on facial recognition system to determine the position of drivers head, detection of the face and components (eyes(left, right), mouth, forehead) on it, the frequency of blinking eye lids, detection of yawning on the basis of mouth size.

2.2. SPEECH RECOGNIZATION

Driver calling for help, word "HELP" gets identified, then stored phone numbers as emergency contact numbers get called i.e. auto dialing emergency numbers.

3. FUNCTIONING

Fatigue Detection has following detection methods:

3.1. EYE TRACKING:

After detecting face using Hear classifier, eye tracking module detects whether eyes are closed or open and if eyes are closed it provides voice alert "You are sleepy please take a rest" to driver.

3.2. YAWN DETECTION:

Yawn Detection Yawn Detection includes mouth tracking. When Open mouth is detected system detects yawning and provides voice alert "Stop yawning and continue driving" to driver.

3.3. STRESS RECOGNIZATION

4. ALGORITHM RESULTS:

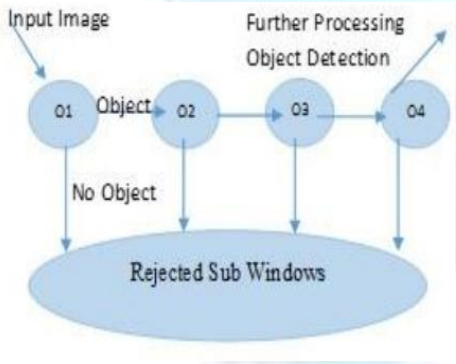

Fig 2.Haar Classifier

OpenCV provides HaarCascade classifier which is used to detect faces. It provides easy face detection and face regions and other body parts tracking. Haar classifier detects face regions in form of rectangular frames. Value of a Haar feature is difference between the additions of the black and white rectangular frames pixel values.

Haar-Classifier detects face regions in form of rectangular frames. Value of a Haar feature is difference between the additions of the black and white rectangular frames pixel values.

In our system, firstly we will be using OpenCV Technology to capture continuous images of the driver. By using the algorithms viz. Blob analysis, Feature extraction, Yawning Detection Algorithm, analysis of the expressions on the driver's face is done. In the analysis, the stress level on the driver's face is determined. Based on the analysis, if the stress level is more than alert messages are sent to the emergency contact numbers of the driver and to the driver himself. In case of any accident scenario, if the driver says a word "Help", alert messages are sent again to his emergency contact numbers.

5. CONCLUSION

Most of the systems designed to prevent accidents by driver distraction are very expensive which are generally installed in high range cars which is not affordable by common man. Therefore, in this project we have been working to cut the prizes which are affordable for common man, thus reducing the death rate caused by road accidents. In the analysis, the stress level on the drivers face is determined. Based on the analysis, if the stress level is more, then the alert messages are sent to the emergency contact numbers of the driver and to the driver himself.

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