

Hybrid Accident Prevention Using Eye Blinking

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Abstract - Transportation safety is important for detection of Driver's Drowsiness. Drowsy driving is an important reason of traffic accidents. Driver Fatigue is one of the major reasons causing most fatal road accidents around the world. This shows that in the transportation industry specially, where a heavy vehicle driver is often open to hours of monotonous driving which causes fatigue without frequent rest period. Hence it is very essential to design a road accidents prevention system for detecting driver's drowsiness, which determines the level of driver inattention and give a warning when an impending hazard exists. The SMS or mail alert sends to the emergency helpline numbers about the drowsiness of a driver with the vehicle details and the contact details to the nearest police station and the help line numbers. This project provides Eye Blink Monitoring System that will alert the driver in drowsiness. A system for monitoring eye movements would be useful in warning drivers when they fall asleep. The driver's eye is continuously monitored using a web camera. To monitor the number of eye blink, threshold limit is been set. Webcam keeps monitoring the eye blinks based on this threshold. When the blink gets fluctuated from the threshold limit then the system automatically plays a song and helps the driver to get rid of drowsiness. Two algorithms are implemented one is based on edge detection that helps in monitoring the brightness of video and the other algorithm is based on counting the dark pixels to monitor the driver accurately. This in general avoids road accident due to fatigue of drivers if this system is implemented in every vehicle. The purpose of such a model is to advance a system to detect fatigue symptoms in drivers and to alert the drivers to avoid accidents. This is developed as a windows application using Python language. MySQL backend is used to store the vehicle information such as vehicle number, driver contact details and the helpline numbers.

Keywords- Drowsiness, MySQL backend, Eye Blink etc.

I. INTRODUCTION

The ever-increasing numbers of traffic accidents all over the world are due to diminished driver's vigilance level. Drivers with a diminished vigilance level suffer from a marked decline in their perception; recognition and vehicle control abilities & therefore pose a serious danger to their own lives and the lives of the other people. For this reason, developing systems that actively monitors the driver's level of vigilance and alerting the driver of any insecure driving condition is essential for accident prevention. Many efforts have been reported in the literature for developing an active safety system for reducing the number of automobiles accidents due to reduced vigilance.

In addition, long time driving would result in perspiration on the sensors, diminishing their ability to monitor accurately. The second technique is well-suited for real world driving conditions since it can be non-intrusive by using video cameras to detect changes. Driver operation and vehicle behavior can be implemented by monitoring the steering wheel movement, accelerator or brake patterns, vehicle speed, lateral acceleration, and lateral displacement. These too are nonintrusive ways of detecting drowsiness, but are limited to vehicle type and

driver condition. The final technique for detecting drowsiness is by monitoring the response of the driver. This involves periodically requesting the driver to send a response to the system to indicate alertness. The problem with this technique is that it will eventually become tiresome and annoying to the driver. The propose system based on eyes closer count & yawning count of the driver. By monitoring the eyes and mouth, it is believed that the symptoms of driver fatigue can be detected early enough to avoid a car accident. The eye blink frequency increases beyond the normal rate in the fatigued state. In addition, micro sleeps that are the short periods of sleep lasting 3 to 4 seconds are the good indicator of the fatigued state, but it is difficult to predict the driver fatigue accurately or reliabl based only on single driver behavior.

II.SYSTEM STUDY

1.Existing System

The most existing methods have focused on employing supervised learning methods to estimate vigilance states. However, till now, there is no standard criterion for vigilance scale labeling, and the existing vigilance labeling methods are complex, expensive and sometimes unreliable and therefore choose clustering methods to mine the latent

distribution of EEG for vigilance estimation. Electroencephalogram (EEG) power spectra estimation, independent component analysis and fuzzy neural network models to estimate subjects' cognitive state in a dynamic virtual-reality-based driving environment. It first uses the independent component analysis (ICA) to remove artifacts and extract possible sources of brain activities from continuous EEG recordings. After calculating power spectrum of each ICA components, it correlates the information between the human alertness and the ICA power spectra. Here human alertness is given by a performance index (driving error expressed as deviation between the center of the vehicle and the center of the lane). They select the alpha-band power in two major ICA components with the maximum correlation coefficients for individual subject as the input features of the estimation models.

2. Disadvantages of existing system:

- Most of the accident are in driver sleeping stage
- No safet

3. The Proposed System

Robust and accurate in real time eye tracking system has been a fundamental and challenging problem for computer vision. This paper proposed a new method to estimate eye-position and direction based on initial centroid analysis technique. The proposed method was validated by tracking eye position within high and low occlusion condition. In this concept, represent a methodology for detection of eye blinking robustly in real time environment. Here we use the connected component technique and centroid method to track and blinking of eyes on OpenCV platform which is open source and developed by Intel. While the drowsiness detected by the driver end, and then the alarm played loudly for alerting the driver.

3. Advantages of proposed system:

- Accurately finds the driver drowsiness
- Avoiding accidents for sleeping drivers
- Increases the Safety
- Sound Alarm played for waking the driver.

III. SYSTEM DEVELOPMENT

1. Description of Mudels

- Driver Module
- Face Recognition
- Edge Detection
- Accident Prevention
- Threshold Calculation
- Alarm Module

2. Driver Module

The Driver module focuses on who drives the vehicle. Driving is the controlled operation and movement of a motor vehicle, including *cars*. A person whose job is to drive a vehicle (such as a taxi, truck, or bus). In this System, at front of the driver seat has fitted the camera for monitoring the driver.

3. Face Recognition

In this module the camera has focused on the car/vehicle driver face. A face recognition system is a technology capable of identifying a person from a digital image or a video frame from a video source. Face detection is a computer technology being used in a variety of applications that identifies human faces in digital images.

4. Edge Detection

In this module the after the driver face detection and the driver eye it will be detected. Here two algorithms are implemented one is based on edge detection that helps in monitoring the brightness of video and the other algorithm is based on counting the dark pixels to monitor the driver accurately. This in general avoids road accident due to fatigue of drivers if this system is implemented in every vehicle.

5. Accident Prevention

In this module the driver's eye is continuously monitored using a web camera. To monitor the number of eye blink, threshold limit is been set. Webcam keeps monitoring the eye blinks based on this threshold. When the blink gets fluctuated from the threshold limit then the system automatically plays a song and helps the driver to get rid of sleepiness.

6. Threshold Calculation

In this module, the eye blink count has been calculated and compared with the threshold for sleeping count ratio. The threshold can be changed in the code depends on the user values.

7. Alarm Module

The threshold calculated and compared with the count of the eye blink. If the current value crosses the threshold limit, the system raises the sound alarm to indicate the driver drowsiness. By this the driver can wake and control the vehicle and avoids the accident.

IV. OUTPUT SCREENS

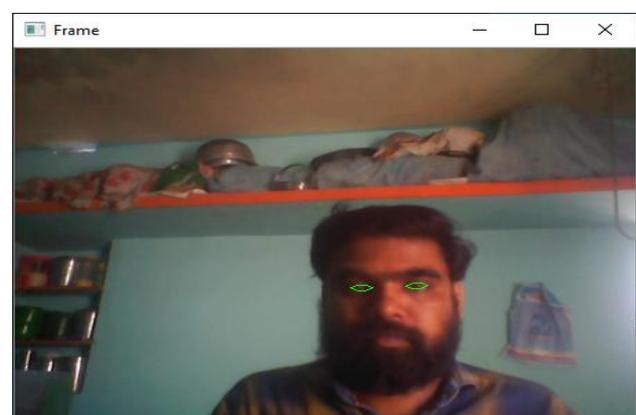


Fig. 1 Eye detection



Fig. 2 Threshold calculation

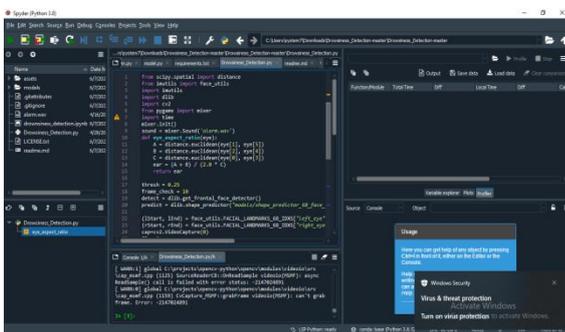


Fig. 3 Software code 1

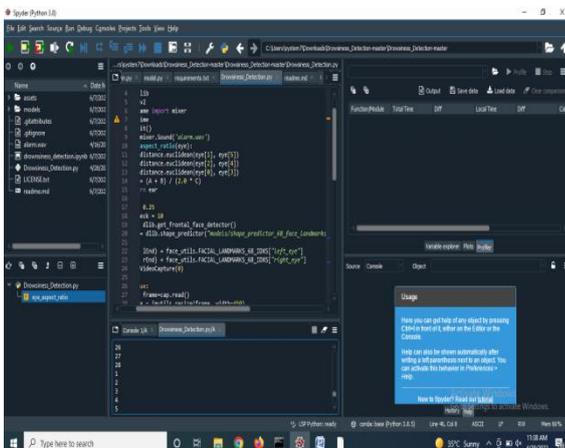


Fig. 3 Software code 2

VI. SCOPE FOR FUTURE ENHANCMENT

The future enhancement is optimizing medical data and satisfies the user requirements. Every application has its own merits and demerits. The project has covered almost all the requirements. Further requirements and improvements can easily be done since the coding is mainly structured or modular in nature. Changing the existing modules or adding new modules can append improvements. Further enhancements can be made to the application, so that the future enhancement is we develop the application through website and useful manner than the present one.

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V. CONCLUSION

The conclusions of our study suggest that domain-specific knowledge improves the results. Purpose of our project is to help solving real life problem in very cost effect way. It alerts the vehicle driver as well as the owner of the vehicle. Whenever the driver feels drowsy and closes his eyes for more than a second, the buzzer is blown. As a result, it alerts the driver. It also warns the owner of the vehicle driven by sending him text messages. As a result, the accident ratio decreases. Hence, our project if commercially developed will help in saving the precious life of vehicle driver & money of the owner.