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SLEEPING ALERT SYSTEM FOR CAR AND VEHICLE DRIVER

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ABSTRACT

For any vehicle accident, driver's faults are the foremost accountable aspect to cause dangerous problems to the society. Sometimes drivers cannot control their vehicles because of different reasons it may cause severe accidents. Accidents due to driver drowsiness can be prevented using an accelerometer and an eye blink sensor module which consist of an IR sensor and a relay. The driver is supposed to wear the eye blink sensor frame throughout the journey and blink needs to be for a couple of seconds to detect the drowsiness. The accelerometer will detect the movement of the head. The result of this project is that the buzzer attached to the eye blink sensor's frame will generate an alert if the driver falls asleep and a notification will be sent to the owner of the vehicle through the Blynk application.

Keywords: Drowsiness, Fatigue, Mishap, Eye-Blink Sensor, Accelerometer, Node-MCU, Blynk, Accident.

I. INTRODUCTION

Driver's fatigue has been considered as one of the most common issues for a huge number of accidents basically due to tiredness, stress and unfavorable climate and road situations. Drowsiness related accidents have all the consequences of being more serious accidents, because of the higher speed involved distraction and the driver being not able to do anything in order to avoid this activity, or even try brakes before the accident takes place. When drivers fall asleep then the driver basically loses his control over the vehicle. Fatigue is a very important safety problem which has not been deeply tackled by any country in the world yet because of its nature. There is a need to design a smart vehicle system through advanced technology which can prevent having accidents up to a certain level. Sleeping alert system for car/vehicle drivers is an alert system to alert the driver on the condition of drowsiness while driving. Sensors like Eye blink sensor, Accelerometer, NodeMCU monitors the driver's eye blinking, eye closure, head and neck posture. These monitored characteristics helps to measure driver's fatigue and instantly alert the driver via buzzer and sends a notification to the owner of vehicle who can contact him and make him conscious to avoid accident. The main objective of Sleeping alert system for car/vehicle driver is to prevent causes due to drowsiness because of which road accidents happen every now and then across the world. So, activities like these should be basically required to be handled automatically without any human supervision and an implementation of smart alert system in a vehicle which is the primary objective of this project which can prevent road accidents from happening.

II. LITERATURE REVIEW

The term "fatigue" is associated with the term sleepy,that basically means an inclination to fall asleep.

Following are the authors whose paper were studied:-

1. Literature review on" Real time drowsy driver detection using haar cascade samples." Dr.Suryaprasad J, Sandesh D, Saraswathi V.J.[5] proposed the method for face or eye detection using image processing in real time. In this proposed project, it clarifies the method for utilizing the haar cascade tests and drowsiness identification and separation of the eye blink. This paper basically introduces a real vision based strategy which can distinguish drowsiness. The basic difficulties are blink and face recognition,the location of iris in different conditions and creating a real time system.

2. J. Lee, H. Jung, K.R. Park and J. Kim proposed another driver checking system considering driver tiredness and diversion.[5] The event that the driver is looking forward to and tiredness identification is done. Besides that, another eye recognition is done and calculation is done and presented. It basically joins the versatile

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boosting,the blob discovery with eye acceptance and layout matching . These calculations are diminishing the eye discovery lapse and handling the time essentially, by accomplishing the said calculations. Thirdly, they have basically used principal component analysis and linear discriminant analysis with the end goal to achieve the exact eye identification and Fourth, they have proposed an eye state detection, calculation that will join the appearance gimmicks got utilizing principal component analysis and linear discriminant analysis, with measurable peculiarities.

3. Fatigue Detection Using Vehicle State (Steering Wheel) Algorithm. Arefnezhad et al. [6] proposed a non-interfering drowsiness detection system based on the vehicle steering data basically using a neuro fuzzy system which supports vector machines and the particle swarm optimization algorithm. Mutya et al. [7] proposed a system to resolve the issue of fatigue using steering wheel algorithm. It is based on pictorial-based steering movement and CNN algorithm for the proper classification of fatigue, which can basically reduce the false drowsy detection rates.

III. METHODOLOGY

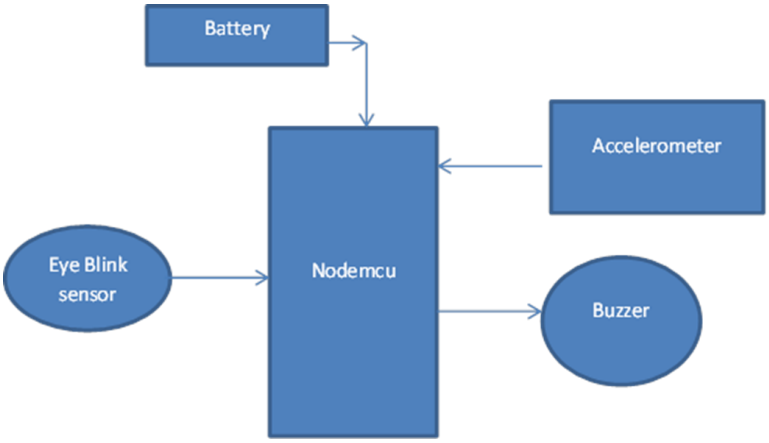

Figure 1: Block diagram of sleeping alert system for car/vehicle driver

We designed a system to detect the drowsiness of the driver while driving and alert them to avoid any major accident. In this project we've used the following component:

1) Eye Blink Sensor
2) Accelerometer
3) NodeMCU
4) Buzzer
5) Blynk Application

The Eye Blink Sensor module consists of an IR sensor, a relay and an eye frame of glasses which has to be worn by the driver. The IR sensor frame consists of the IR transmitter which transmits the IR rays towards the driver's eyes and an IR receiver which receives the reflected rays when the eyes are closed. The relay provides the extra current required by this module. The buzzer generates an alert whenever the driver falls asleep. Accelerometer module is used to measure any movement of the driver's head with the reference position which will help in detection of the drowsiness of the driver. If the driver's head is tilted left, right, forward, backwards more than the reference angle and it stays in that position for more than 3 seconds then the accelerometer will generate an alert which will be further sent to the NodeMCU. All the sensor modules mentioned above are connected to the NodeMCU which is used as a controller of this system. It takes all the sensor data provided by all the sensors and provides it to the IOT dashboard. NodeMCU has an inbuilt Wi-Fi module which is used to connect it to the internet and give access to the IOT devices. This controller will process all the data given by the sensors and will give a specific output according to the sensor's data sent to the blynk application. Blynk application will be used to connect mobile and laptop to IOT. This application will give alerts on mobile applications remotely and buzzer will act as an output device of this system according to the data given by the sensors to the NodeMCU, if the controller detects the drowsiness of the driver then the buzzer will alert the driver and it will help in avoiding accidents. T. This application will give alerts on mobile.

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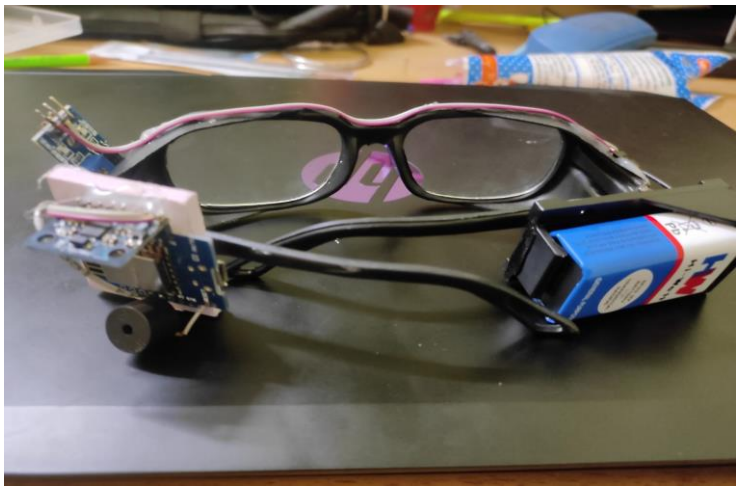
IV. RESULTS AND DISCUSSION

A technique to avoid collision due to drowsiness is designed and installed in a IOT based model. The sensor modules can determine whether the driver is sleepy or in the state where he can drive or not. The machine basically offers an alert to the driver. Therefore this Sleeping alert system can save the driver to avoid any kind of mishap happening due to drowsiness or fatigue.



V. CONCLUSION

This method typically combines two totally different systems in one integrated system. The system is used to construct a way to measure drowsiness of the driver with severity of collision due to mishap. However, if the angle between the head and steering wheel remains within the range, and the eyes are open then no change in the state of the system will occur. Similarly, if the angle between head and steering wheel increases from the threshold range, then the system urgently alerts using buzzer and a warning through blynk application will be sent to the owner of vehicle to alert the driver. The various ways in which fatigue or drowsiness can be manipulated in a simulated environment which is natural. To detect drowsiness is high, these are highly intrusive.

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