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DASH BOARD MONITORING AND DROWSINESS DETECTION OF A DRIVER

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ABSTRACT-Accidents due to driver drowsiness can be prevented using eye blink sensors. The driver is supposed to wear the eye blink sensor frame throughout the course of driving and blink has to be for a couple of seconds to detect drowsiness. Any random changes in steering movement leads to reduction in wheel speed. The threshold of the vibration sensor can be varied and accordingly action can be taken. The outcome is that the vibrator attached to eye blink sensor's frame vibrates if the driver falls asleep and also the LCD displays the warning messages. The wheel is slowed or stopped depending on the condition. This is accompanied by the owner being notified through the GSM module, so the owner can retrieve the driver's location, photograph and police station list near to driver's location. This is how the driver can be alerted during drowsiness and the owner can be notified simultaneously.

Index Tearms: eye blink sensor, LCD, Microcontroller, Drowsy Driver Detection System.

1. INTRODUCTION

For any vehicle accidents driver's faults are the most accountable aspect to cause dangerous problem to the society. Many drivers cannot control the vehicles due to different reasons it may cause severe accidents and sometime death. For vehicle accidents various factors involved such as drunk driving, over speeding, many distractions like texting while driving, talking with others, playing with children etc. one of the important factor is sleeping on the wheel. People know the dangerous of alcohol consumption and run the vehicles but they not understand the seriousness of fatigue driving. A fatigue Driver those who falls asleep at the move fails to control the vehicle, not possible to take immediate action and results in a crash so it is necessary to monitor the drowsiness of the driver to prevent accidents.

Automatic driver drowsiness can be detected using artificial intelligence and visual information. System is to detect, track and examine face and eyes of drivers for this different real vehicle image of drivers are taken to validate the algorithms. It is a real time system work in different light conditions [1]. The numbers of accidents are increased due to several factor, one of the main factor is that driver fatigue. Driver's sleepiness is also implemented using video based approach. This system is noninvasive and human related elements are used. Band power and Empirical Mode Decomposition methods are used to investigate and extract the signal, SVM (Support Vector Machine) used to confirm the analysis and to categorize the state of vigilance of the driver [2]. The system designs to find the drivers drowsiness using the hypothesis of Bayesian networks. The interaction between driver and vehicle features are extracted to get reliable symptoms of driver drowsiness. It presents more suitable and accurate strategies to design drowsy driver detection system [3]. Brain and visual activity is used in drowsiness detection system. Electroencephalographic (EEG) channel used to monitor the brain activity. Diagnostic techniques and fuzzy logic are used in EEG based drowsiness detector. Using blinking detection and characterization for visual activity monitored. Electrooculo graphic (EOG) channel are used to extract the Blinking features [4]. In this approach machine learning used to determine the human behavior during driver drowsiness, for this 30 different facial actions including eye blink, yawning and head movements are collected to detect the driver drowsiness . The concept of drowsy driver detection system focuses on the functioning of all sensor modules used in the project. This helps explain the inputs received by modules and the outputs they produce.

Scope of the problem is eye blink sensor.

2. PROPOSED METHOD

We can overcome the disadvantage of the existing method by improving system prototype is built on the base of oneembedded platform ARM which controls all the processes. Experimental results illuminate the validity of this carsecurity system. In this proposed embedded car security system, Driver distractions are the leading cause of most vehicle crashes. In traditional accident alert system, when a driver met with an accident can be informed to respective family members through an SMS but there is no system which monitors the driver conditions and avoid accidents. The driver alert system is used to avoid accident occurrence due to driver abnormal behavior. At the time of vehicle start alcohol sensor will detects the alcohol consumption of the driver. If the driver alcohol consumption is above particular limit then access for user is denied by locking ignition. Drowsy drivers typically have problems to control their eyes. If alcohol consumption is limited then the vehicle will be

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running and next the driver may meet accident due to drowsiness so eye blink sensor monitors the eye blink status of the driver if for particular duration driver doesn't blink his eyes then the vehicle is stopped. Head movements of the driver are monitored by MEMS sensor to alert the driver.

3.BLOCK DIAGRAM

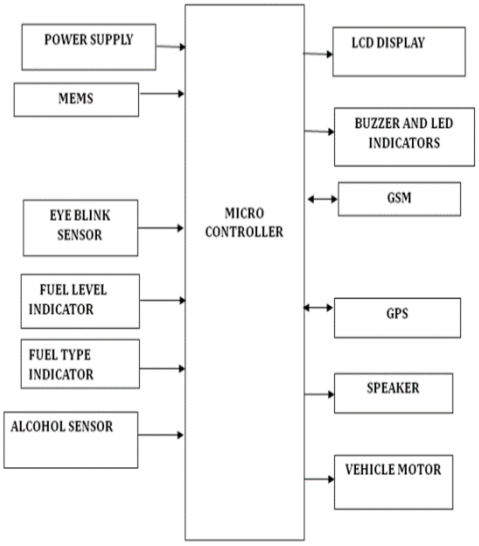

Figure 1- Block Diagram

3.1. EYE BLINK SENSOR

This sensor module consists of the eye blink sensor frame, the IR sensor and a relay. The vibrator device is connected to the eye blink sensor frame which is to be worn by the driver. This vibrator vibrates whenever an accident occurs or the driver falls asleep. The 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 and hence is also connected to the SST microcontroller board .

Figure 2- Eye Blink Sensor

3.2 LCD

LCD is a device which displays the messages in case the driver falls asleep or accident occurs. The messages displayed are ―SLEEPING‖ and ―ACCIDENT OCCURRED‖ as per the situation. All the modules are connected to it so that the particular signals can be received and hence message could be displayed. It uses the power supply from the SST microcontroller board displays a ―WELCOME‖ message. It also provides 5V power to other modules .

Figure 3- LCD

3.3 GSM MODULE

The GSM module used is GSM-SIM300. This module's primary function is to send an audio warning message to the owner's registered number that is, in case of any accident the owner is notified by it android application which plays an audio saying ―accident occurred, kindly check your phone‖. A sim card is to be fixed in this module to simultaneously send a text message on the owner's phone.

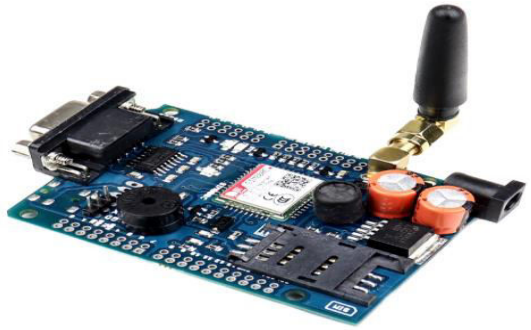

Figure 4-GSM Module

3.4 MICROCONTROLLER

This is the main working unit which connects all the inputs and outputs to its 4 ports namely, P0 P1 P2 P3 and each of them have 8-pins which act as pins for input and output. The main ac dc power supply f 12V is given to this board. It has a huge RAM and ROM which helps the program run faster as compared to other microcontrollers and also provides extra memory storage capacity .

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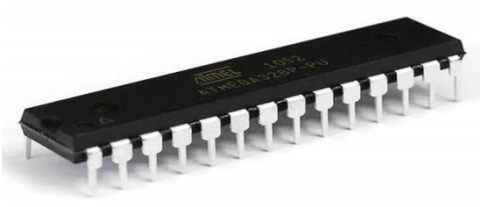

Figure 5- Microcontroller

3.5BUZZER

Figure 6- Buzzer

The **buzzer** consists of an outside case with two pins to attach it to power and ground .When current is applied to the **buzzer** it causes the ceramic disk to contract or expand. Changing the This then causes the surrounding disc to vibrate. That's the sound that you hear.

3.6ARDUINO UNO

Figure 7-Arduino UNO

The **Arduino Uno** is a microcontroller board based on the **ATmega328** (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button.

3.7GPS MODULE

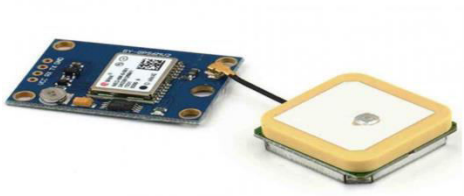

Figure 8- GPS Moudle

GPS receivers use a constellation of satellites and ground stations to compute position and time almost anywhere on earth. With this information and some math, a ground based **receiver** or **GPS module** can calculate its position and time.

4. RESULT AND DISCUSSION

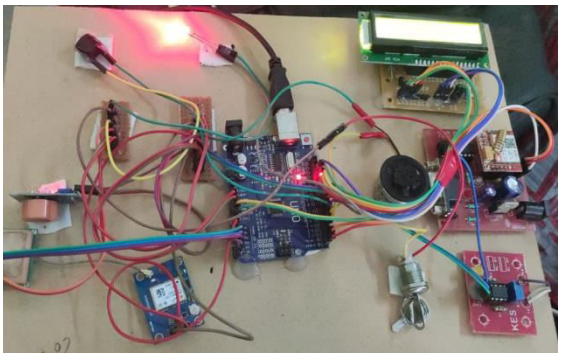

Figure 9- Final OutPut

The driver is supposed to wear the eye blink sensor frame throughout the course of driving and blink has to be for a couple of seconds to detect drowsiness. Any random changes in steering movement leads to reduction in wheel speed. The threshold of the vibration sensor can be varied and accordingly action can be taken. The outcome is that the vibrator attached to eye blink sensor's frame vibrates if the driver falls asleep and also the LCD displays the warning messages. The wheel is slowed or stopped depending on the condition. This is accompanied by the owner being notified through the GSM module, so the owner can retrieve the driver's location, photograph and police station list near to driver's location. This is how the driver can be alerted during drowsiness and the owner can be notified simultaneously.

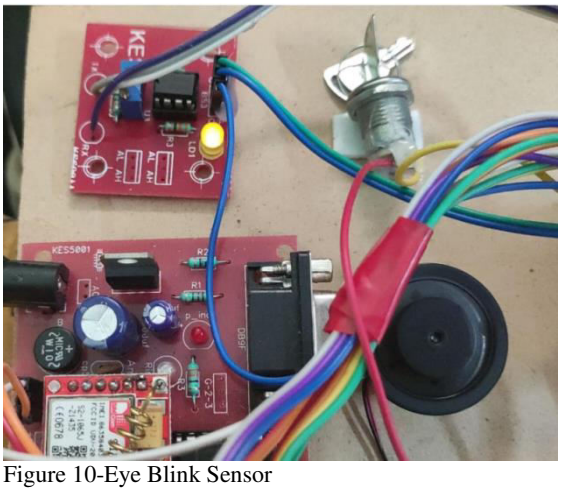

Figure 10-Eye Blink Sensor

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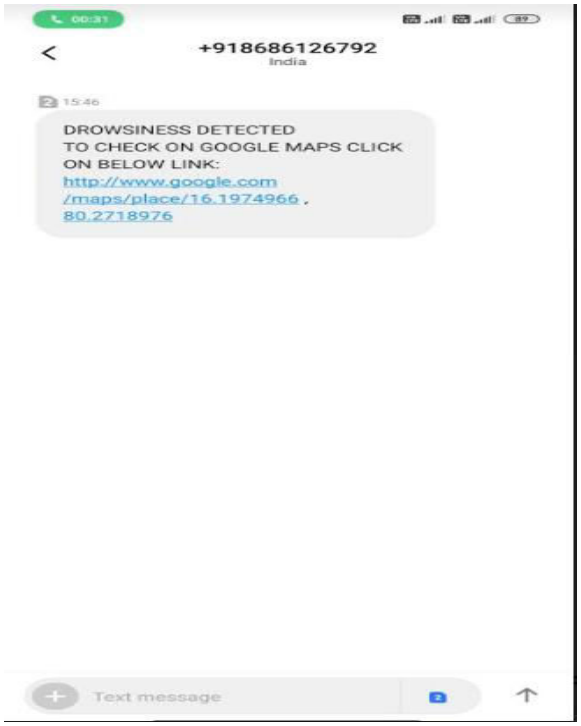

Figure 11- Message Sent To The Owner.

5.FUTURE SCOPE

Coming to future scope this system can be further extended to have security like only certain people can access the vehicle. In case of theft, the vehicle does not start and an mms of the burglar could be sent to the owner of the vehicle. We can add raspberry pie in real operation.

6. CONCLUSION

The proposed system helpful to avoid vehicle accidents because of driver's sleepiness using eye blink sensor, in this paper we study 504 International Journal of Engineering & Technology and design the system for driver fatigue detection. If the driver becomes drowsy the eye blink sensor's frame vibrates attached to the vehicle and also the LCD displays the warning messages and it alerts the driver's through alarm sound to avoid the road accidents. The wheel is slowed or stopped depending on the condition. This is accompanied by the owner being notified through the GSM module, so the owner can retrieve the driver's location, photograph and a list of nearby police stations.

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