

# VEHICLE ACCIDENT PREVENTION SYSTEM USING EYE BLINK SENSOR AND NOTIFICATION SYSTEM

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**Abstract :** High level of stress, drowsiness and lack of concentration are a number of the most factors that affect the drivers, which may cause traffic jam and even accidents. One of the challenges that has caught the eye within the area of research of prevention of traffic accidents, it's the generation of mechanisms that contribute to monitoring and evaluating the driver behavior. This paper is about the vehicle accident prevention system using eye blink sensor and notification system. Here with the help of eye blink sensor we can detect the driver drowsiness. When the driver is in drowsy state, automatically we can control the vehicle. So the accident which are caused due to drowsiness are prevented. In the exceptional cases other than drowsiness, when the accidents are occur, in that case with help of vibration sensor we can detect the accidents and generate the notification system using GPS and GSM module. The vibration sensor are set up with high threshold frequency, so when the accident occur it generate the notification system. The GSM and GPS send the message and longitude and latitude of the accident location to the respective person. So the recovery process made faster and rescue patient.

**Keywords - Drowsiness, eye blink sensor, vibration sensor, GSM, GPS, threshold frequency.**

## I. INTRODUCTION

The vehicle accident prevention system using eye blink sensor is the future scope concept. Because the future is full of electric vehicles, so the implementation of the concept is very easy and more accurate. In the existing system we are using the smart helmet concept. But this concept is only applicable for two wheelers. But our proposed concept was applicable in any type of electric vehicles. In smart helmet concept alcohol sensor and vibration sensor are used, alcohol sensor is connected to the bike ignition system. When the rider is consumed alcohol the alcohol sensor detect it by the breathing air. The sensor detect the alcohol content in the air by person breathing, when the rider consumed alcohol smart helmet system does not turn on the ignition system. So the rider cannot start the bike and raid. So the vehicle accident occur due to alcohol consumption is prevented. But in practical over consumption of alcohol person did not in conscious state so the person cannot wear helmet. The system is failure in case of not wear helmet. Then the vibration sensor which is connected in the helmet work, when the accident occur it generate the GSM process to contact the respective person to know him the accident is occur. Here is also one drawback which is the sensor is located in the helmet only when the helmet hit on the ground forcely, then only the GSM module work. But the proposed concept we are not used alcohol sensor. We are used eye blink sensor to detect the drowsiness of drivers. The alcohol consumption makes the person unconscious, so the same concept is used in the drowsiness concept. Drowsiness means unconscious state of mind. So we can almost cover all area related to safety of drivers and accident can be prevented easily. When compare to smart helmet concept this is more faster and secure system. This paper is consist of five section,

- a. BLOCK DIAGRAM
- b. EYE BLINK SENSOR
- c. VIBRATION SENSOR
- d. ULTRASONIC SENSOR
- e. ARDUINO NANO

## II. BLOCK DIAGRAM

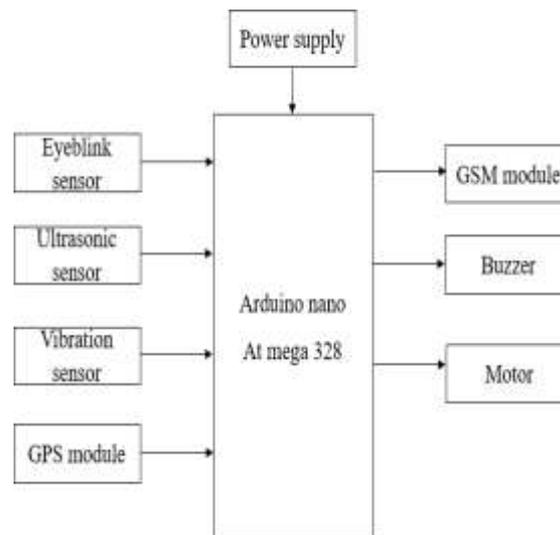


Fig . 1

## III. BLOCK DIAGRAM EXPLANATION

The eye blink sensor is used to detect the driver drowsiness. When the driver is in drowsy state, the eye blink detect it by when the eyelids are closed for more than 5sec. Then state is called drowsy state. Now the signal is passed to microcontroller, ultrasonic sensor which is connected to microcontroller receives the signal and check the condition. Depend upon the condition it send a signal to motor drive. In ultrasonic sensor we give a two condition, one is they are two ultrasonic sensor are connected to the vehicle. We give the ultrasonic distance is 20m, now the ultrasonic sensor measure the distance from both end. If there is any vehicle is present in any one of the end then the signal is send to motor drive and the vehicle stops suddenly and the buzzer is generated and alert the driver to wake up. Then the driver reset the module and continue the journey. Otherwise another condition when there is no vehicle at both side end, then the signal is send to motor drive. Now the motor which is connected to steering is rotate in left side and the main motor rotate only for 5sec to park the vehicle in left side of the road and the buzzer is generated to alert the driver to wake up. Then the driver reset the module and continue the journey. In the exceptional cases when the accident is occur the vibration sensor which is connected in the front of the vehicle is set at high threshold frequency is detect the accident and send a signal to microcontroller. The microcontroller send a signal to GPS and GSM module. The GSM and GPS module generate and send the GPS location along with the message to the respective person or police station or ambulance service. So the rescue process is more faster than the normal one.

## IV. EYE BLINK SENSOR

The eye-blink sensor work when the eyelid are close. It is detected by the infrared rays. The duration of a blink is on the typical 100–150 milliseconds according to UCL researcher and between 100–400 ms according to the Harvard Database of Useful Biological Numbers. Closures in more than 1000 ms were defined as micro sleeps. This sensor module consists of the attention blink sensor frame, the IR sensor and a relay. The vibrator device is connected to the attention blink sensor frame which is to be worn by the driving force . This vibrator vibrates whenever an accident occurs or the driving force falls asleep. The module consists of the IR transmitter which transmits the IR rays towards the 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 Arduino Nano microcontroller board.

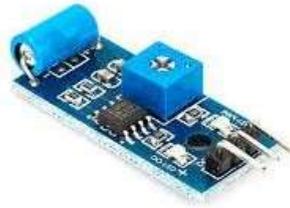


Fig. 2

## V. VIBRATION SENSOR

The vibration sensor is additionally called a piezoelectric sensor. These sensors are flexible devices which are used for measuring various activity. This sensor uses the piezoelectric effects which measures the changes within acceleration, pressure, temperature, force otherwise strain by changing to an electrical charge. When attached to a bit of kit , any

vibration will reflect a change in velocity, which can cause the accelerometer to supply an electrical signal. The maximum amplitude or range of the vibration being measured will determine the range of the sensor which can be used. The working of this sensor is to sense any jerk given to the vehicle which is that the emulation of the accident occurrence in real time. The output produces and send a signal to dc micro motor and stops the rotation of the wheel.



*Fig. 3*

## VI. ULTRASONIC SENSOR

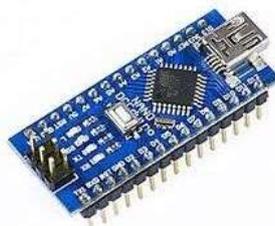
An ultrasonic sensor is an device that measures the space of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of hearing sound (i.e. the sound that humans can hear). For ultrasonic sensing, the foremost widely used range is 40 to 70 kHz. The frequency determines range and resolution; the lower frequencies produce the best sensing range. A commonly used frequency is 58 KHz, the measurement resolution is one centimeter (cm), and range is up to 11 meters. Ultrasonic sensors work by emitting sound waves at a frequency too high for humans to concentrate to . Then they wait the sound to be reflected back, calculating distance supported the time required. This is almost similar to how radar measures the time it takes a radio emission to return after hitting an object.



*Fig. 4*

## VII. ARDUINO NANO

The Arduino Nano could also be a little, complete, and breadboard-friendly board supported the ATmega328 (Arduino Nano 3.x). It has more or less the same functionality of the Arduino Duemilanove, but during a special package. It does not have a DC power jack, and works with a Mini-B USB cable rather than a typical one. It is wont to produce a clock of precise frequency using constant voltage. There is one limitation using Arduino Nano i.e.it doesn't accompany DC power jack, means you'll not supply external power source through a battery.

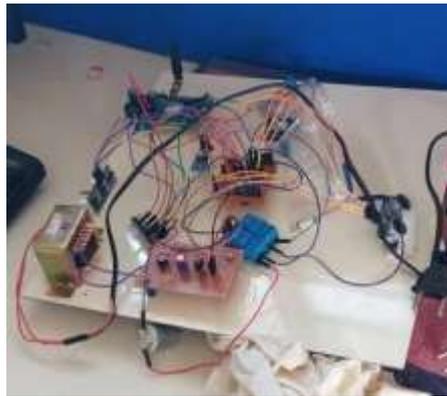


*Fig. 5*

## VIII. RESULT

The vehicle accident prevention system using eye blink sensor and notification system, we use three sensor and two motors. Depending upon the condition the sensors and motor are work. Now see the eye blink sensor work only when the eyelids are closed for 5sec. then the ultrasonic sensor used to measure the distance of the object, here we set it as 20m. we use two ultrasonic sensor to measure the distance from front and back side of the vehicle. In a 20m distance from both end any vehicle is present the motor1 stop suddenly that is braking system is applied and the buzzer start alarm for 5 sec. like that in a 20m distance from both end no vehicle is present the motor1 rotate for 10sec and the motor2 that is steering motor

rotate only for 5 sec to park the vehicle and both motor get stops and the buzzer is alarm for 5 sec. thus the accident is prevented from the drowsiness.



**Fig. 6**

## IX. CONCLUSION

There are many ways to prevent the accident in the future. But the best way to prevent the accident which are caused due to drowsiness is eye blink sensor and automatic vehicle control method. As of now the next 10 to 20 years is full of electric vehicles in order to minimize the fuel usage. Many countries are band the fuel usage vehicle and give a discount to buy the electric vehicle. So the accident prevented system using eye blink sensor and automatic vehicle control method is very easy to implement in electric vehicles. Because the E- vehicle uses motors instead of engines. Whereas in now a days vehicle the automatic vehicle control is very critical one and the implementation is complex process. But the implementation is easy in electric vehicle and the accident, which are caused due to drowsiness is easily prevented.

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