ACCIDENT PREVENTION GLASS

A PROJECT REPORT

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in partial fulfillment for the award of the degree

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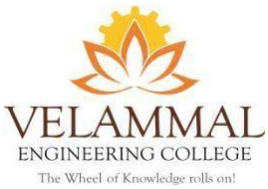

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BONAFIDE CERTIFICATE

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ABSTRACT

Today “Road Safety” is one of the biggest public health issues throughout the country. Lakhs of lives are lost annually due to road accidents. Night driving accidents are unfortunately quite common. According to the Ministry of Road Transport and Highways, 55% of all road accidents in India occur at night. In 2020, there were a total of 4,39,649 road accidents in India, resulting in 1,54,732 deaths. Out of these, 2,40,768 accidents and 81,525 fatalities occurred at night. During night time drowsiness while driving is a serious problem that can lead to accidents. Which can result in a loss of control of the vehicle and potential accidents. Accident will be reduced by the accident prevention glass. This gadget substantially helps cars drivers while driving car with drowsiness. It reduce many road accidents and many lives can be saved. Eye blink sensor is the important sensor in this device. It designed to detect eyes, measure eye blinks and detecting drowsiness or sleepy in drivers to prevent accidents by alerting drivers. We have put collectively an automated breaking system and parking system to stop such incidents. We have installed relay is commonly used in safety systems to prevent accidents. It can be used to shut off power to a machine if a safety switch is activated. If a driver is feel drowsiness or sleepy eye blink sensor senses the eyes and send the data. Then the relay turning it off or preventing the flow of current to the circuit of the motor. This paper talks about in element the building and blessings of this model.

Keywords: Eye blink sensor, Arduino board, Relay, Buzzer, Motor

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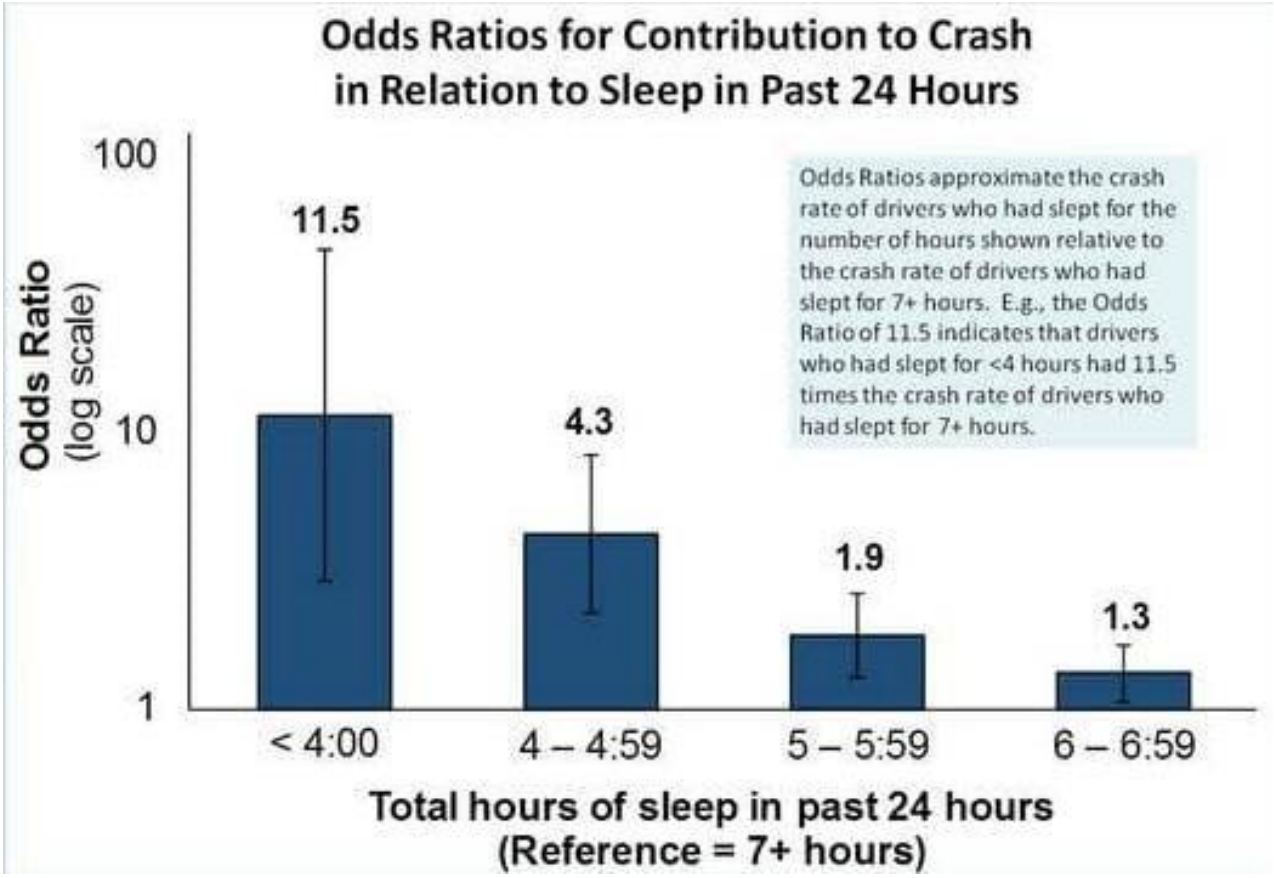
CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Everyone needs to attain their vacation spot in the modern-day world as shortly as possible, with the variety of automobiles growing each and every day. Vehicles are extra usual via day in order to retailer time, humans prefer to tour at night. During night time driving lead to serious accidents and injuries. Some drivers are feel sleepy while travelling in car or heavy vehicles. If the driver feel continually drowsiness or sleepy there may be a case of very dangerous and increases the risk of accidents. Sleepiness can result in crashes any time of the day or night, but three factors are most commonly associated with drowsy-driving crashes. It occur most frequently between midnight and 6 a.m., or in the late afternoon. At both times of the day, people experience dips in their circadian rhythm the human body's internal clock that regulates sleep. Often involve only a single driver (and no passengers) running off the road at a high rate of speed with no evidence of braking; and Frequently occur on rural roads and highways. Drowsiness accidents are a significant problem on the roads, especially on long trips or during late-night or early-morning hours. In 2019, the National Crime Records Bureau (NCRB) reported a total of 449,002 road accidents in India, resulting in 151,113 deaths and 451,361 injuries. While it is difficult to determine how many of these accidents were specifically caused by drowsy driving, it is clear that drowsiness and fatigue are significant factors in many road accidents in India. We first want to reduce the accident due drowsiness or sleepy by seting buzzer and automatic breaking system in order to deal with people who has met with an drowsiness or sleepy accident.

1.2 TRAGEDY HAPPENED IN INDIA DUE TO NIGHT ACCIDENT



CHAPTER 2

2.LITERATURE SURVEY

2.1 SRUVEY INTRODUCTION

This literature survey aims to provide an overview of the existing research and development related to standalone devices for language translation and drowsiness monitoring using IoT and machine learning technologies. The use of these technologies has been increasingly explored in recent years, with the aim of improving communication across language barriers and enhancing public safety through the monitoring of drowsiness. This survey will examine the current state of the art in these areas, including the hardware and software components of such devices, as well as their accuracy and effectiveness in real-world settings.

We will review relevant academic journals, conference proceedings, and other publications to identify key themes and trends in this field. Additionally, we will examine potential limitations and areas for further development, including technical challenges, ethical considerations, and implications for future research and innovation. [1] In this paper, Drowsiness detection is a crucial aspect of safety in various fields, including transportation, aviation, and healthcare. One of the most popular ways to detect drowsiness is through standalone devices that use various techniques to monitor the level of alertness of an individua. [2]Driving safety: Several studies have explored the use of eye blink sensors to detect driver drowsiness and prevent accidents caused by drowsy driving. For example, a study published in the International Journal of Advanced Science and Technology in 2019 developed a system that used a combination of eye blink sensors and machine learning algorithms to detect driver drowsiness with high accuracy. [3] Industrial safety: Eye blink sensors can also be used to detect worker fatigue in industrial settings and prevent accidents caused by tired workers. A study published in the International Journal of Occupational Safety and Ergonomics in 2020 explored the use of eye blink sensors to detect fatigue in train drivers and found that the sensors were effective in detecting fatigue and alerting drivers to take a break. [4] Medical safety: Eye blink sensors can also be used to prevent accidents in medical settings, such as during surgery. A study published in the Journal of Medical Systems

in 2017 explored the use of eye blink sensors to detect the onset of anesthesia-induced hypnosis and prevent complications during surgery. [5] Sports safety: Eye blink sensors can also be used in sports settings to prevent accidents caused by head injuries. A study published in the Journal of Medical Systems in 2019 explored the use of eye blink sensors to detect concussions in football players and found that the sensors were effective in detecting concussions and alerting coaches and medical staff. [6] "Driver Drowsiness Detection Using Eye Blink Duration and Closure Velocity" (2021) in IEEE Access: This study proposes a novel method for detecting driver drowsiness using eye blink duration and closure velocity. The method was tested on a dataset of drivers in a simulated driving environment and achieved high accuracy in detecting drowsiness. [7] "Fatigue Detection Using Eye Blink Frequency and Pupil Diameter for Truck Drivers" (2019) in International Journal of Industrial Ergonomics: This study developed a system for detecting driver fatigue using eye blink frequency and pupil diameter measurements. The system was tested on a group of truck drivers and found to be effective in detecting fatigue and alerting drivers to take a break. [8] "Detection of Cognitive Load and Stress Level in Automotive Environments Using Eye Blink Characteristics" (2020) in Frontiers in Psychology: This study explores the use of eye blink characteristics to detect cognitive load and stress level in drivers. The study found that eye blink characteristics were effective in detecting cognitive load and stress level and could be used to develop more adaptive in-car systems. [9] "Detecting Driver Fatigue Using Eye Blink and Heart Rate Variability Analysis in Real-Time" (2020) in Journal of Medical Systems: This study proposes a real-time system for detecting driver fatigue using eye blink and heart rate variability analysis. The system was tested on a group of drivers in a simulated driving environment and found to be effective in detecting fatigue and alerting drivers to take a break.

CHAPTER 3

3. Proposed Work

3.1 Overview

Deterrence of Accidents using IOT is to reduce accidents. The demise rate is expanding step by step because of mishap. Similar drowsiness which helps the driver for better vision during night travel is additionally liable for some mishaps that are being caused. The sleepiness must be avoided by the drivers while driving. Driving at night without sleep, driving at night without proper training, driving at night without taking breaks can be extremely dangerous.This makes a dangerous accident and causes many casualties to others. A driver falls asleep unconsciously while driving at night and it can result in a major accident. Crashing into an oncoming vehicle, hitting a wall on the side, hitting a tree on the side, or hitting a vehicle behind can cause a huge accident and cost many lives. This paper contains ideas about how to prevent drivers from falling asleep while driving at night, avoid major accidents and reduce night time casualties. When the driver sleeps, a eye blink sensor in the glass senses the eyes if the driver close the eyes upto 5 seconds, the buzzer makes allarm sound inside the car while he fall as sleeps. we use eye blink sensor for this project. This eye blink sensor senses the drivers eyes every seconds. Eye blink sensor is the important sensor in this device. It designed to detect eyes, measure eye blinks and detecting drowsiness or sleepy in drivers to prevent accidents by alerting drivers. When the driver falls asleep, The automatic breaking system will be turn on automatically to stop the car and turns on the parking light to give the emergency signal to the car to follow. It prevent the car of the person behind from hitting our car. The system should start sensing drowsiness right from starting of the trip.

3.2 Methodolody

The collection of elements utilized in this circuit are Ardino, LED, DC motor, Buzzer, Relay change. The impact sensor and the Electronic Control Unit have been installed,

which maintained a distance of at least half of a meter from every different and mounted a bodily interface with an exclusive electrical cable with a socket at the two ends to make the devices smooth. The ECU used to be pushed via a strength adapter.

The DC motor has been installed and powered by using a battery. It has additionally been examined to relay to activate the automatic breaking systen in the DC motor. Alert can be used for all sorts of vehicles, such as lorries, cars, rickshaws etc. The buzzer alerts when the driver sleeps, a eye blink sensor in the glass senses the eyes if the driver close the eyes upto 5 seconds, the buzzer makes allarm sound inside the car while he fall as sleeps. This is a boon for late night drivers. Because of its low fee and convenient installation, this task is higher than the techniques presently available.

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino senses the environment by receiving inputs from eye blink sensors, and turn on the buzzer connected to arduino, LED to indicate the parking light will turn on, Relay switch on the automatic breaking system to stop the DC motor connected to power supply and relay. The eye blink sensor is the main infrared sensor. The transmitter transmit continuously emits infrared waves onto the eye to relay.

3.3 Working Procedure

Arduino is used with a tracking the entire technique. For the detection of car drivers eye blink sensor is used, It senses the eyes and transmit data continuously to the arduino. To alert the driver buzzer is used, to alert the following car LED(parking light) is used. The relay is used to turn on or turn off the DC motor. when the relay is turn on the current supply to the DC motor is turn off. So the motor will be stoped immediately.

CHAPTER 4

4. HARDWARE USED

4.1 HARDWARE OVERVIEW

Eye blink sensors used in accident prevention glass can be based on different hardware technologies, depending on the specific requirements of the application. Here are some examples of hardware technologies that can be used in eye blink sensors for accident prevention Electrooculography (EOG): EOG is a technique that measures the electrical activity of the muscles that control eye movements. Eye blink sensors based on EOG use electrodes placed around the eyes to detect changes in the electrical activity that occur when a person blinks. EOG-based sensors can be used to detect eye blinks with high accuracy and are often used in research settings. Infrared (IR) sensors: IR sensors can be used to detect eye blinks based on the reflection of IR light from the eye. IR sensors are non-invasive and can be integrated into a variety of wearable devices, such as glasses, to detect eye blinks and monitor the user's alertness level. Electroencephalography (EEG): EEG is a technique that measures the electrical activity of the brain. Eye blink sensors based on EEG use electrodes placed on the scalp to detect changes in the electrical activity that occur when a person blinks. EEG-based sensors can be used to detect eye blinks and monitor the user's cognitive state, such as drowsiness and fatigue. Video-based sensors: Video-based sensors can be used to detect eye blinks based on changes in the shape and appearance of the eye when a person blinks. Video-based sensors can be integrated into wearable devices, such as glasses or head-mounted displays, and can be used to monitor the user's alertness level and prevent accidents.

4.2 BLOCK DIAGRAM

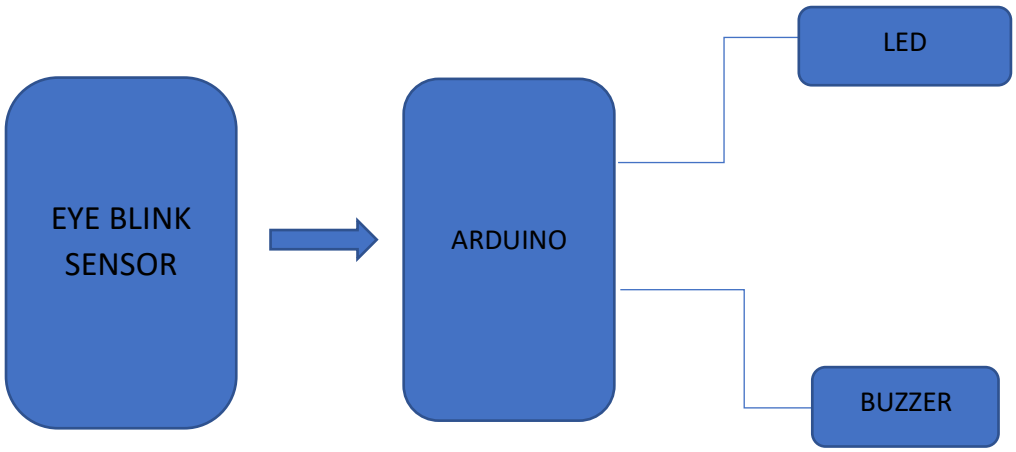


Figure 4.2 Block diagram of accident prevention glass

4.3 THE LIST OF COMPONENTS

COMPONENTS	NO.OF.COMPONENTS	PRICE
Arduino Uno R3	**1**	**900**
Eye blink sensor	**1**	**200**
buzzer	**1**	**20**
Male/female Wire	**10**	**20**
Relay	**1**	**150**
LED	**1**	**5**
DC motor	**1**	**100**

4.4 HARDWARE USED

4.4.1. ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328P shown in figure 2.3.1. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack.

Figure 4.4.1 Arduino Board

4.4.2. EYE BLINK SENSOR

The eye blink sensor is an infrared sensor. It contains two parts. A transmitter and a receiver. The transmitter continuously emits infrared waves onto the eye. While the receiver continuously looks for variations in the reflected waves which indicates that the eye has blinked.

Figure 4.4.2 Eye blink sensor

4.4.3. RELAY

Relays were used extensively in telephone exchanges and early computers to perform logical operations. The traditional form of a relay uses an electromagnet to close or open the contacts, but other operating principles have been invented, such as in solid-state relays which use semiconductor properties for control without relying on moving parts.

Figure 4.4.3 Relay

4.4.4 BUZZER.

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, train and confirmation of user input such as a mouse click or keystroke.

Figure 4.4.4 Buzzer

4.4.5 IMAGES OF THE PROTOTYPE

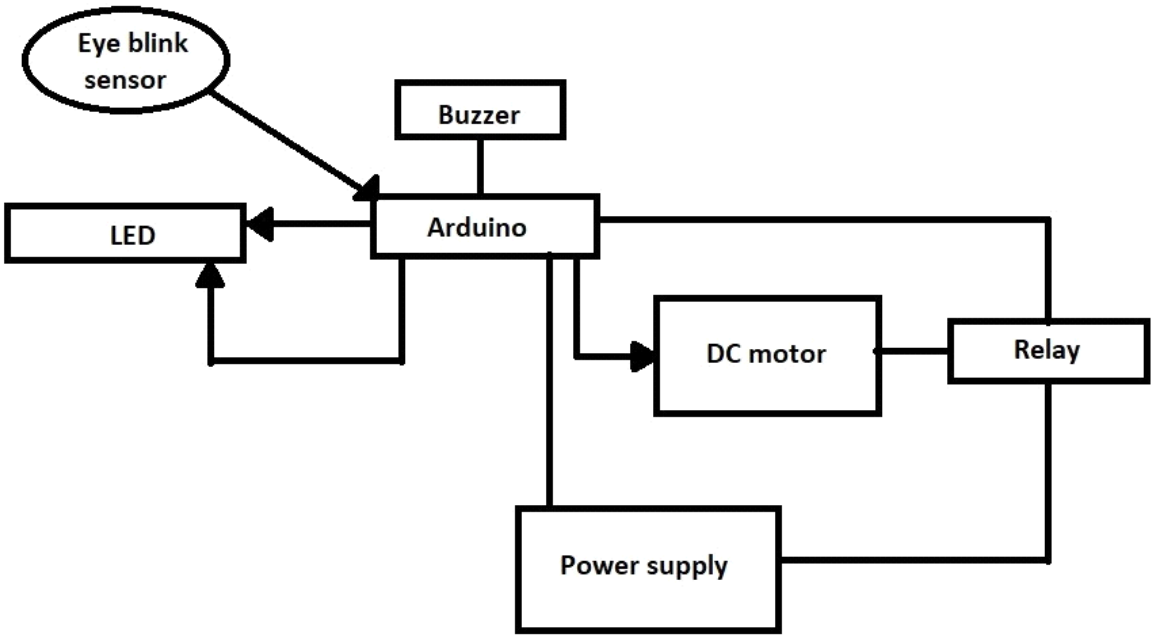


Figure 4.4.5 Prototype model

CHAPTER 5

SOFTWARE

5.1 SOFTWARE USED

5.1.1 ARDUINO UNO

The application programmed is developed using Arduino IDE and Processing software. The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. The environment is written in Java and based on Processing and other open-source software. This software can be used with any Arduino board

RESULTS AND DISCUSSION

Figure 4.2 shows the connection diagram of the eye blink sensors with Arduino.

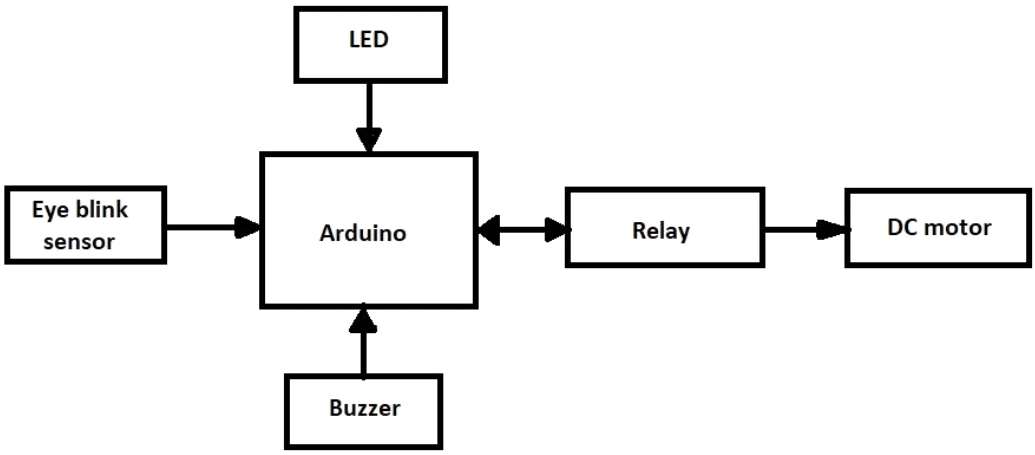


Figure 4.2 connection diagram of eye blink sensor with Arduino

When the driver sleeps, a eye blink sensor in the glass senses the eyes if the driver close the eyes upto 5 seconds, the buzzer makes allarm sound inside the car while he fall as sleeps. we use eye blink sensor for this project. This eye blink sensor senses the drivers eyes every seconds. Eye blink sensor is the important sensor in this device. It designed to detect eyes, measure eye blinks and detecting drowsiness or sleepy in drivers to prevent accidents by alerting drivers. When the driver falls asleep, The automatic breaking system will be turn on automatically to stop the car and turns on the parking light to give the emergency signal to the car to follow. It prevent the car of the person behind from hitting our car. The system should start sensing drowsiness right from starting of the trip.

APPENDIX

Arduino code: (Programming Code)

```
#define Relay 13
#define buzzer A0
static const int sensorPin = 10;                 // sensor input pin
int SensorStatePrevious = LOW;               // previousstate of the sensor
unsigned long minSensorDuration = 3000; // Time we wait before  the sensor active as long
unsigned long minSensorDuration2 = 6000;
unsigned long SensorLongMillis;     //Time in ms when sensor was active
bool SensorStateLongTime = false;                // True if it is a long active
const int intervalSensor = 50;   // Time between two readings sensor state
unsigned long previousSensorMillis;               // Timestamp of the latest reading
unsigned long SensorOutDuration;                // Time the sensor is active in ms
//// GENERAL ////
unsigned long currentMillis;          // Variabele to store the number of milleseconds since
the Arduino has started
void setup() {
  Serial.begin(9600);               // Initialise the serial monitor
  pinMode(sensorPin, INPUT);          // set sensorPin as input
  Serial.println("Press button");
  pinMode(Relay,OUTPUT);
  pinMode(buzzer,OUTPUT);
}
// Function for reading the sensor state
void readSensorState() {
// If the difference in time between the previous reading is larger than intervalsensor
  if(currentMillis - previousSensorMillis > intervalSensor) {
   // Read the digital value of the sensor (LOW/HIGH)
```

```
  int SensorState = digitalRead(sensorPin);
  // If the button has been active AND
  // If the sensor wasn't activated before AND
  // IF there was not already a measurement running to determine how long the sensor has
been       activated
  if (SensorState == LOW && SensorStatePrevious == HIGH && !SensorStateLongTime)
{
  SensorLongMillis = currentMillis;
   SensorStatePrevious = LOW;
   Serial.println("Button pressed");
   } // Calculate how long the sensor has been activated
   SensorOutDuration = currentMillis - SensorLongMillis;
   // If the button is active AND
   // If there is no measurement running to determine how long the sensor is active AND
   // If the time the sensor has been activated is larger or equal to the time needed for a long
active
   if (SensorState == LOW && !SensorStateLongTime && SensorOutDuration >=
minSensorDuration) {
     SensorStateLongTime = true;
     digitalWrite(Relay,HIGH);
     Serial.println("Button long pressed");
   }
   if (SensorState == LOW && SensorStateLongTime && SensorOutDuration >=
minSensorDuration2) {
    SensorStateLongTime = true;
     digitalWrite(buzzer,HIGH);
     delay(1000);
     Serial.println("Button long pressed");
   }
```

```
    // If the sensor is released AND
    // If the sensor was activated before
    if (SensorState == HIGH && SensorStatePrevious == LOW) {
      SensorStatePrevious = HIGH;
      SensorStateLongTime = false;
      digitalWrite(Relay,LOW);
      digitalWrite(buzzer,LOW);
      Serial.println("Button released");
     }

    // store the current timestamp in previousSensorMillis
   previousSensorMillis = currentMillis;
}
}
void loop() {
  currentMillis = millis();    // store the current time
  readSensorState();           // read the sensor state
  }
```

CONCLUSION

The proposed framework manages the mishap alarming and automatic breaking. Arduino is the core of the framework which helps to switch on the LED, turn on the buzzer and automatic breaking. Drivers are relaxed at some stage in the night time and fall in drowsiness. The Smart System for the road system which uses the IOT concept was implemented in this project. Drivers are safe during the night by using the accident prevention glass. Automatic street light and deterrence of accident is the same principle of accident prevention glass. The product efficiency is mainly affected by the out of sensing. The device can be additionally send the data if the driver wakes after alarming the buzzer, that data will also be send to arduino and the driver is back to noemal from drowsiness.

REFERENCES:

[1] Vibin Varghese, AmrithaShenoy, Sreeram K, Remya K P, "Ear Based Driver DrowsinessDetection System",IOSR Journal of Engineering (IOSRJEN) – ISSN (e): 2250-3021, 2018, ISSN.

[2] Lei Zhao, Zengcai Wang, Xiaojin Wang, Qing Liu, "Driver Drowsiness Detection using Facial Dynamic Fusion Information & a DBN", IET Intelligent Transport Systems25th October 2017.

[3] Tianyi Hong, Huabiao Qin, "Drivers Drowsiness Detection in Embedded Systems", 2007, IEEE.

[4] AjithKumar.A ,Jaganivasan.V , Sathish.T, Mohanram.S, "Accident Detection And Alerting System Using Gps&Gsm", (Vol. 8, Issue 2, (Part -2) February 2018).

[5] Namrata H. Sane, Damini S. Patil, Snehal D. Thakare, Aditi V. Rokade, "Real Time Vehicle Accident Detection And Tracking Using Gps&Gsm", 2016, (ISSN: 2321-8169 Volume: 4 Issue: 4 479-482).