

IoT Based Smart Intelligent Lighting System For Smart City

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Abstract : This study has been undertaken to design solution for road accidents due to drink & drive. During drunk driving crashes, there are thousands of people killed, and much more people are injured. Besides being a great threat to public safety and health, drunk driving also imposes a heavy financial burden on the whole society, especially on the healthcare sector. According to U.S. Central of Disease control (CDC), the annual cost of alcohol-related crashes is more. Proposed Drink and Drive Detection system for detecting alcohol consumed driver. This system is successfully developed to minimize the deaths and save many lives by providing emergency services. This system will reduce the number of accidents by achieving higher sensitivity and accuracy. This system is more user-friendly and reliable, verified by automotive industry.

IndexTerms - Emergency services, Drink and Drive Detection system, sensitivity and accuracy.

I. INTRODUCTION

Drink & drive is a leading cause of road accident. The concern related to drunk driving is not only the high crash rate, but also the type of crashes that are most likely to happen. During drunk driving crashes, there are thousands of people killed, and much more people are injured.

Every minute, on an average, at least one person dies in a vehicle crash. Auto accidents also injure at least 10 million people each year, two or three million of them seriously. It is predicted that the hospital bill, damaged property, and other costs will add up to 1-3 percent of the world's gross domestic product. Intersections are a common place for crashes, which may be due to the fact that there are several conflicting movements, as well as a myriad of different intersection design characteristics. Intersections also tend to experience severe crashes due to the fact that several types of injurious crashes, such as angle and left-turn collisions, commonly occur there. Therefore, accurate and prompt detection of accidents at intersections offers tremendous benefits of saving properties and lives and minimizing congestion and delay.

In this project designing we will try to enhance the scope of embedded system used in vehicle control. According to our project when a alcohol sensor detects that the driver is drunk than the sensor will detect the vibration and send signal to controller and message will be displayed on the LCD screen. Controller sends the alert message through the GSM MODEM including the location to police control room or a rescue team. After receiving the information, police can immediately trace the location through the GPS MODEM. We shall design a system which can detect accidents in significantly less time and send the basic information with geographical coordinates to first aid center within a few seconds. In case of any accident, the system sends automated messages to the pre-programmed numbers. System uses a GPS (Global Positioning System) to know the exact position of the vehicle. The main unit of this project is an alcohol sensor. If the person inside the car has consumed alcohol then the alcohol detection is done by the sensor. Sensor gives the signal to Arduino Microcontroller and the LED glows, the buzzer starts and the ignition relay is off, "Alcohol detected" is displayed on LCD screen and the location is send through GSM, GPS is used to trace the location of the car. Arduino Microcontroller is heart of the project. It is the CPU of the complete circuit. Arduino Microcontroller gives high pulse to the buzzer circuit and the buzzer is turn ON at the same time relay is turned OFF due to this ignition of the car is deactivated.

II. LITERATURE REVIEW

Many of the authors explained the vehicle tracking in embedded system. One of them, [1] presented a real-time computer vision system for vehicle tracking and traffic surveillance. His paper proposed a feature based tracking system.

Vehicle Tracking and Locking System Based on GSM and GPS explained in [2]. Their paper proposed a novel method of vehicle tracking and locking systems used to track the stolen vehicle by using GPS and GSM technology.

The system built on embedded system, is used for tracking and positioning of any vehicle by using GSM and GPS [3]. Their system continuously watches a moving Vehicle and reports the status of the Vehicle on demand. In the paper [4], the GSM network is a medium for transmitting the remote signal. System includes two parts that are the monitoring center and the remote monitoring station. The monitoring centers consist of a computer and communication module of GSM. The remote monitoring station implemented by using VB.

The system which provides vehicle cabin safety, which monitors the level of the toxic gases such as CO, LPG and alcohol within the vehicle and provides alert information as alarm during the dangerous situations [5]. The system sends SMS to the authorized person through the GSM. Detection of gases prevents further accidents.

Vehicle Tracking System Using GPS and GSM Technology [7] is about the design and implementation of Vehicle tracking system using GPS and GSM technology. It comprises of integration between a GPS receiver, a microcontroller and a GSM module. This system is controlled by users using a centralized command interfaces on computer. In the paper [8], design a tracking unit that uses the global positioning system to determine the precise location of a object, person or other asset to which it is attached and

using GSM modem this information can be transmit to remote user. The purpose of this system is to design and integrate a new system which is integrated with GPS- GSM to provide following feature: a) Location information, b) Real time tracking using SMS, c) track bus driver activity d) Communication is instantaneous therefore we can receive running report quickly.

III. PROPOSED DRINK AND DRIVE DETECTION SYSTEM DESIGN

In our system we are trying to improve the existing embedded system used in Drink and drive detection. It plays most important role in Drink and Drive Detection. Detecting drunk driving require stopping vehicle manually scanning drivers by using with breath analyzer. The alcohol detection system works on simple principle if driver has been drinking the alcohol, breath analyzer sensor will detect the level of alcohol in the driver breath and if it crosses set threshold, and alert will come and vehicle engine will stop immediately.

Our system uses alcohol system with GSM modem for SMS notification and LCD display. Our system constantly checks for driver alcohol content. If the system detects the driver is drunk above permissible limit, the sensor input trigger the processor about the issue by providing respective action and the system send SMS notification both register user and authority to inform about the issue. Also, the system stops the motor to demonstrate as engine locking of the vehicle. Thus, the system detects and prevents drunk driving accident automatically.

Figure 1 shows the system is initialized on power ON. When the system is detected to be abnormal, it is confirmed that the accident has occurred. The vibration of the vehicle is detected to confirm the cause of the accident. As soon as the accident is detected the buzzer (alarm) is ON and send message to rescue team after the location is detected by the GPS. A switch is provided for the driver. If it is a minor accident then you have to press the switch to send message "Everything is ok". If it is a major accident, the switch remains OFF.

The objective of this system is to design and implement a Drink and drive detection and ignition key using technology as shown in fig 3. The research and study on how both technologies work is essential to complete the whole project. As in fig. 2, our objective is that eye blink sensor is IR based. The variation across the eye will as per eye blink. If the eye is closed means the output is high otherwise output is low this to know the eye is opening and closing position. This output is given to indicate the alarm and alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyzer and highly sensitive and fast response. A liquid-crystal display (LCD) is a video display that uses the light modulating properties of liquid crystals. Relays are switching that open and closed circuit electromechanically or electronically. Vibration Sensor should sense the vibrations and send this information to the microcontroller. If the vibrations sensed by the sensor are more than the threshold, then microcontroller will detect the accident. If the accident is detected, the location is traced by GPS, GPS unit which give the position of the vehicle to the microcontroller. Arduino microcontroller sends SMS to the handheld mobile phone with the help of GSM modem. User can click on the link in the received SMS. The integration of the GPS tracker with the Google map with ensure that the position of the off ender is given out on the maps readily to ensure easy location and possible further action.

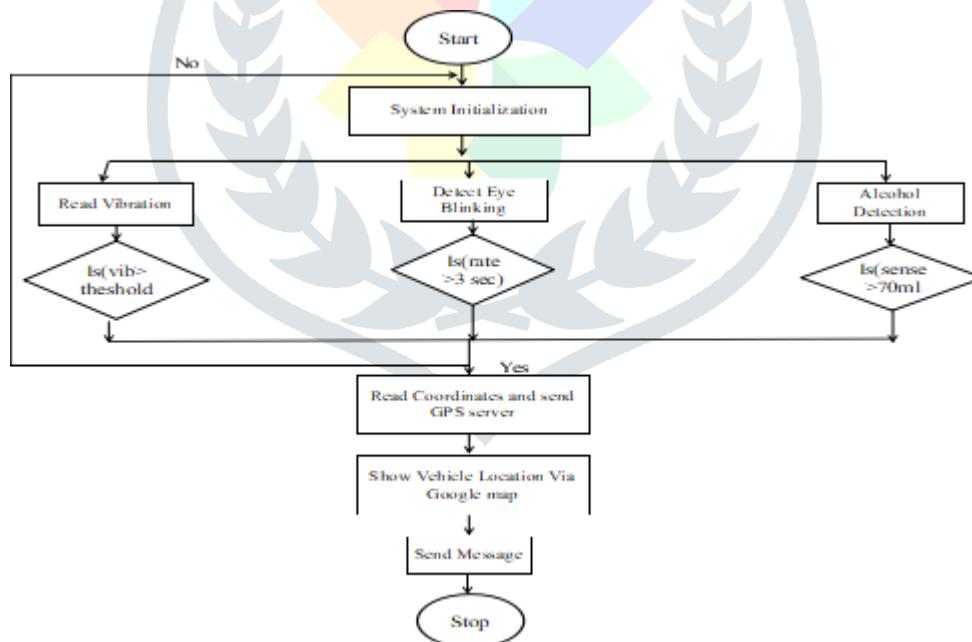


Fig 1: System flow for drink and drive detection

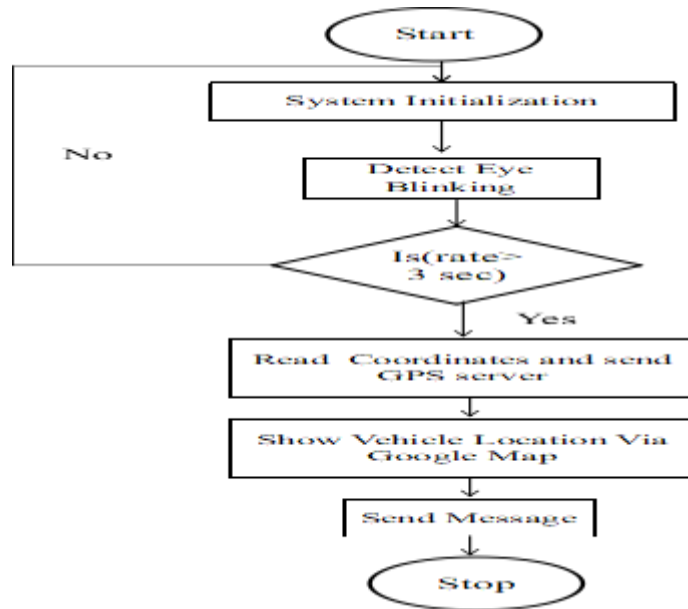


Fig 2: Eye blink detection

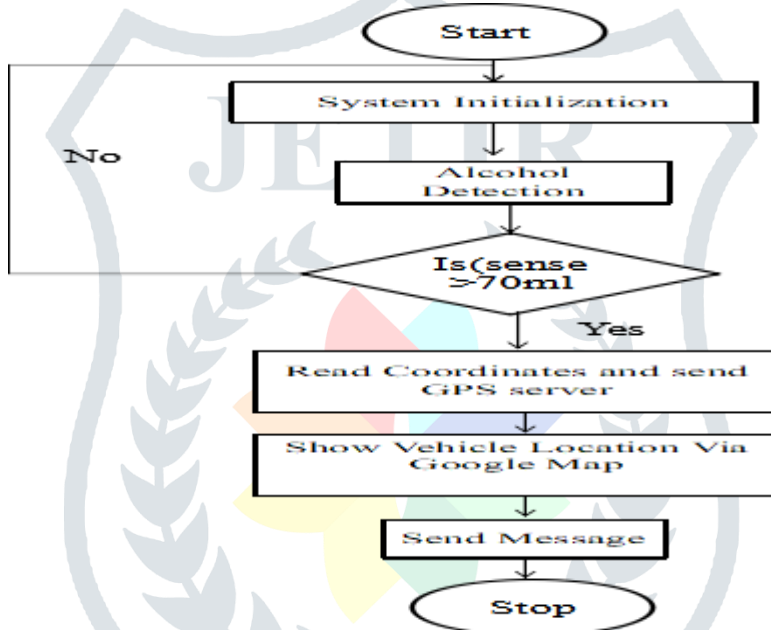


Fig 3: Alcohol detection

IV. RESULTS AND DISCUSSION

We can use the system to control the accidents caused by the alcohol consumption. This system provides the effective development in auto mobiles industries by reducing accidents. This system can also be give the location of the vehicle using GPS to the pre-programmed numbers by using GSM.

As shown in figure 4, The value A=50 shown in the above figure indicates that the driver is safe for driving and he has not consumed alcohol. If the value cross the threshold value i.e A=70 then this will indicate that the driver has consumed alcohol.

The value A=129 in the above figure shows that the value exceeds the threshold value of alcohol and thus this indicates that the driver has consumed alcohol and is not safe for driving.

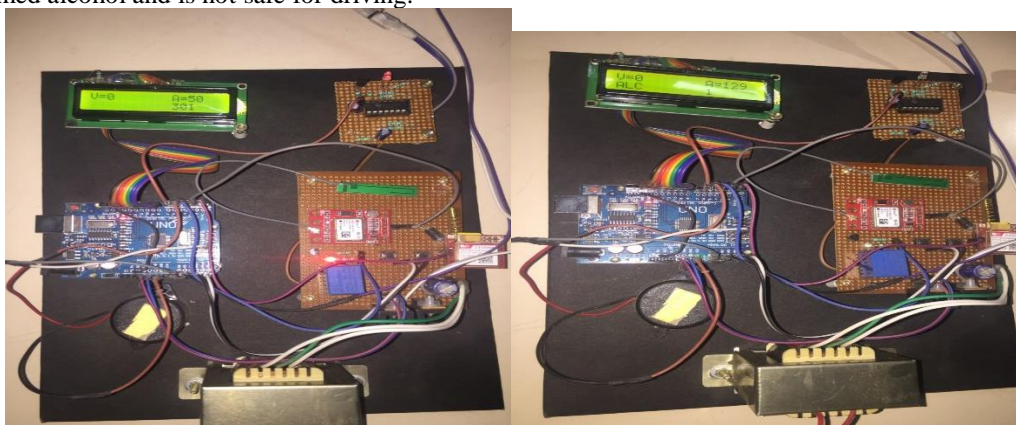


Fig 4: Normal Alcohol level AND Alcohol Detected

The value 159 shown in the above figure 5 indicates that the driver is not in drowsy condition and can drive the system. If the value is above 300, this indicates that the driver is in the drowsy condition. Figure 5 shows value 301 shown in the above figure indicates that the driver is in drowsy condition and is not safe for driving. The system will send the message and the location to the authority.

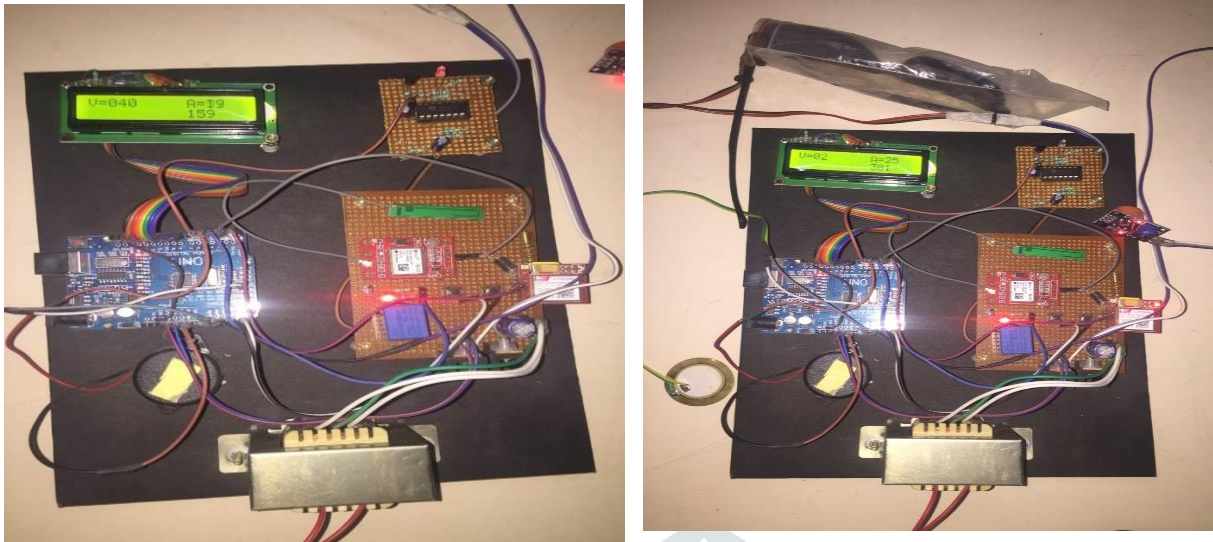


FIG 5: NORMAL EYE BLINK RATE AND EYE BLINK DETECTED

IV. CONCLUSION

The Model “Drink and Drive Detection” is a model fused for detecting alcohol consumed driver. This system is successfully developed to minimize the deaths and save many lives by providing emergency services. This system will have broad application prospects; it integrates the positioning systems and will reduce the number of accidents. The result shows that higher sensitivity and accuracy is achieved using this project. This made the project more user-friendly and reliable. The proposed method is verified to be highly beneficial for the automotive industry. This model is design for the safety of the people seating inside or outside the vehicle.

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