IOT based DD Detection System

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Abstract: Drunk driving, or officially driving under the Influence (DUI) of alcohol, is a major cause of traffic accidents throughout the world. Drunk driving is the reason behind most of the deaths. In this paper, Proposed system aimed at early detection of alcohol consumed driver. Crashes caused by impairment of alertness in vehicle drivers pose a serious danger to people, not only to drivers themselves but also often to the general public. According to the report of U.S. National Highway Traffic Safety Administration (NHTSA), more than a million people have died in traffic crashes in the United States since 1966. During these tragedies, drunk driving is one of the main causes. Proposed Drunk and Drive Detection (DDD) system detects drunk driving in the vehicle itself. System constantly monitors the sensitivity of alcohol sensor for drunk driver detection. If driver is drunk, the processor instantly stops the system ignition by stopping the motor. This system can also be giving the location of the vehicle using GPS to the pre-programmed numbers by using GSM. 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.

IndexTerms **- National Highway Traffic Safety Administration (NHTSA), driving under the Influence (DUI), alcohol sensor, drunk driving detection.**

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 drunken 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 totals are more.

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.

II. LITERATURE REVIEW

Ralph Oyini Mbouna et al. presents visual analysis of eye state and head pose (HP) for continuous monitoring of alertness of a vehicle driver [1]. The proposed scheme uses visual features such as eye index (EI), pupil activity (PA), and HP to extract critical information on nonalertness of a vehicle driver.

Proposed a robust real-time embedded platform monitor the loss of attention of the driver during day and night driving conditions [2]. The percentage of eye closure has been used to indicate the alertness level. The system is found to be robust under actual driving conditions.

Many of the authors explained the vehicle tracking in embedded system. One of them, Benjamin Coifman [3], explained a real-time computer vision system for vehicle tracking and traffic surveillance. His paper proposed a feature based tracking system.

V.Ramya, B. Palaniappan, K. Karthick [4] explained the system which provides vehicle cabin safety. This system 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. The system sends SMS to the authorized person through the GSM. Detection of gases prevents further accidents. Asaad M. J. Al-Hindawi, IbraheemTalib[5] explained the GPS and GSM network. In their paper, system has the two parts, first is a mobile unit and another is controlling station. System results are compatible with GPS technologies. Abid khan, Ravi Mishra [6] explained GPS-GSM Based Tracking System. In their paper, design a tracking unit that uses the global positioning system to determine the precise location of an object, person or other asset to which it is attached and using GSM modem this information can be transmit to remote user.

III. 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 analyser. The alcohol detection system works on simple principle if driver has been drinking the alcohol, breath analyser 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.

This project is design for the safety of the people seating inside or outside the vehicle. Here we proposed the system that along to detect drunk driving in the vehicle itself. 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 detect 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.

3.1 System Flow

The Flow Chart of the system is shown in the figure 1. It 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.

Fig.1 Flowchart for drink and drive detection

3.2 System Implementation

The proposed designed to inform alcohol detection, eye blink detection as shown in figure 2. Using a vibration sensor, proposed system can detect vibration when an alcohol will detect. Pin A0 connected to vibration sensor, 1 for input supply and 1 for ground. Vibrations detect then voltage increase (5v output).Pin 8 to 13 connected to LCD display. We also use alcohol sensor which detect the alcohol. We also use eye blink sensor. The range is between 3sec to 5sec, if in this range if your eye is not blink that time buzzer is on relay is logic 0 and ignition is off. When alcohol sensor, vibration sensor, and eye blink sensor are detected then the output is display on the LCD (liquid crystal display). It will send signal to microcontroller (MCU). The MCU read the data from GPS modem , the GSM modem send an SMS(9600 bit per second data send) to the predefined mobile numbers and inform about the location (latitude and longitude) from remote place. This microcontroller will provide all the functionality of the SMS alert system. We use diode for analog to digital current bipass and capacitor is used for filtering purpose. Register is used for passing limited current to LED and we are used transformer in the project which is 12V and used to convert the AC to DC. The proposed system consists of various modules such as sensor, Global Positioning System, Global System of Messaging, LCD, Buzzer, and Key Shows the proposed system for project. An LCD display is provided to get the display of the tasks carried out.

The objective of this project is to design and implement a Drink and drive detection and ignition key using technology. The research and study on how both technologies work is essential to complete the whole project. The purpose of this project is to detect the Vehicle Accident and locate the vehicle. In this project, 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 indicate the alarm and alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyzer and high sensitive and fast response. A liquid-crystal display (LCD) is a flat panel display, electronic visual display or video display that uses the light modulating properties of liquid crystals. Relays are switches 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.

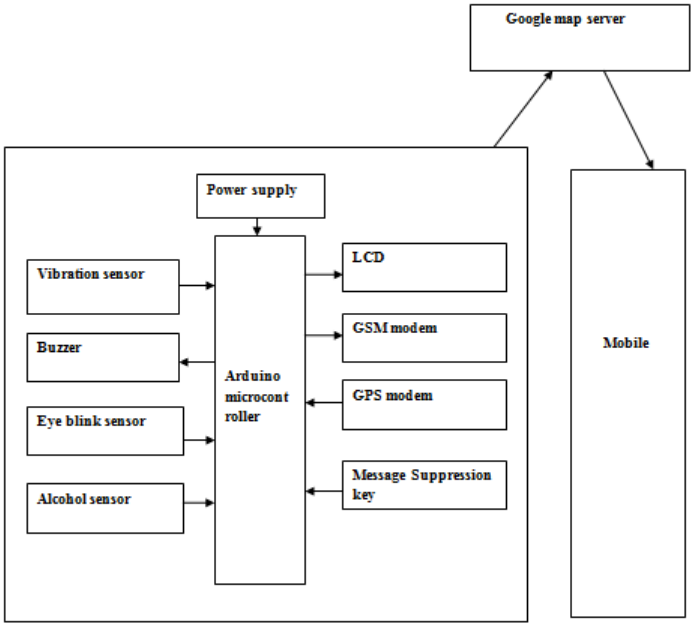

Fig.2 Design for drink and drive detection

IV. Experimental Result and Discussion

Proposed DDD system detect drunk driving in the vehicle itself. Our system uses alcohol sensor and GSM modem for sms notification and LCD display Additionally, 'alert SMS' indicating drunk driver location, tracked by onboard GPS receiver, along with vehicle number is communicated remotely to authorized (family members, traffic police) mobile user using GSM cellular network to take appropriate action. System constantly monitors the sensitivity of alcohol sensor for drunk driver detection. If driver is drunk, the processor instantly stops the system ignition by stopping the motor. If alcohol sensor is not giving high alcohol intensity signals, system lets engine run. MQ3- Alcohol Gas Sensor is a low-cost semiconductor sensor which, used to detect the presence of alcohol vapour gas at concentrations from 0.05 mg/L to 10 mg/L. This project also involves measure and controls the eye blink using IR sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reflected infrared rays of eye. Buzzers and Piezoelectric transducer is used as vibration sensor where it detects the mechanical vibration and converts it into the corresponding voltage values.

3.1 Alcohol Detection

Figure 3 show alcohol detection. The value A=50 shown in Fig. 3a indicates that the driver is safe for driving and he has not consumed alcohol. If the reading cross threshold value, A=70 then this will indicate that the driver has consumed alcohol.
The value A=129 in the figure 3b 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.

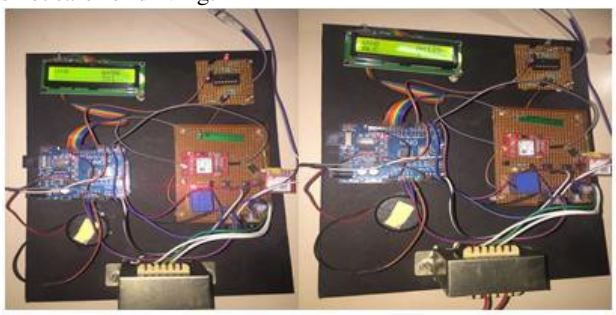

Fig 3 a) Normal Alcohol level b) Alcohol Detected

3.2 Vibration Detection

The figure 4a shows the value for vibration where V=0 indicates that the system is at normal vibrations. If the value exceeds above 300 then this indicates that the system had some vibrations. The value V=1023 shown in the figure 4b indicates that vibrations has occurred in the system. After this the system sends the msg and location to the authority.

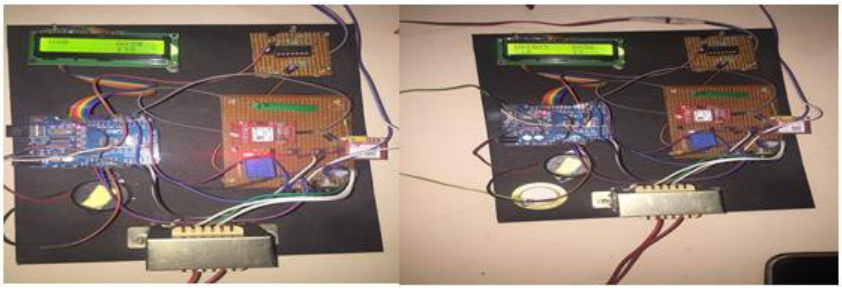

Fig 4 a) Normal Vibration level b) Vibration Detected

3.3 Eye Blink Detection

The value 159 shown in the figure 5a 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. The value 301 shown in the figure 5b 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.

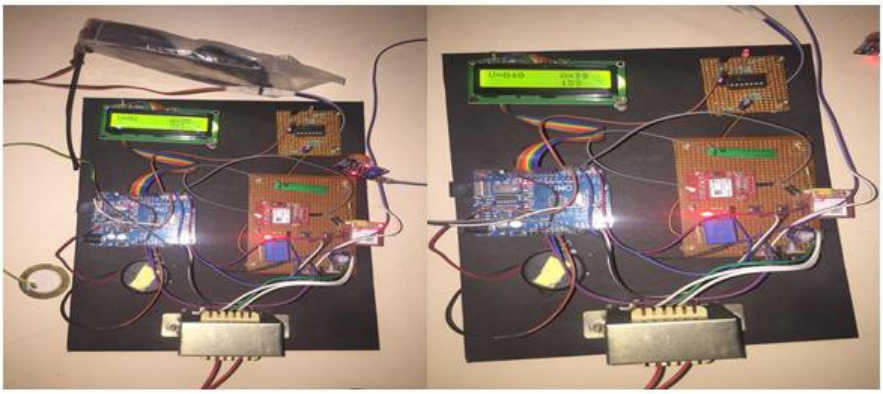

Fig 5 a) Normal Eye blink rate b) Eye blink detected

3.4 GPS Based Location Detection

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. As shown in figure 6, the integration of the GPS tracker with the Google map ensures the position of the off ender is given out on the maps readily to ensure easy location and possible further action.

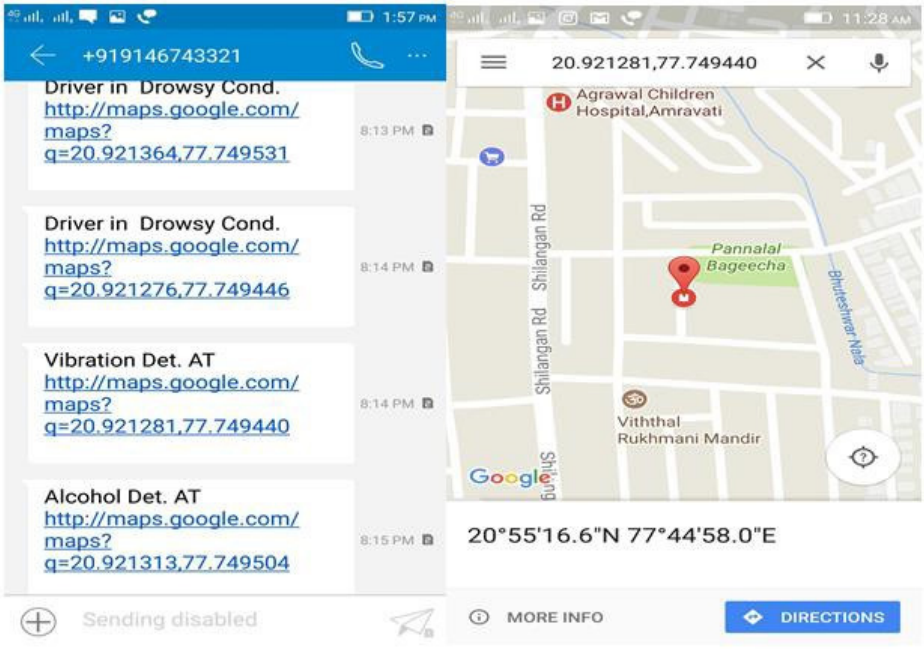

Fig 6 Message of alcohol detection and its location

V. CONCLUSION

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 system can also be giving the location of the vehicle using GPS to the pre-programmed numbers by using GSM. 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.

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