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IOT BASED ALCOHOL ALERT SYSTEM WITH GSM MODULE FOR ROAD ACCIDENTS

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Abstract: The main objective of this project is to reduce motor accidents due to consumption of alcohol by alerting the vehicle pilot regarding the consumption of the alcohol through buzzer indication and also the consumption percentage of alcohol in the 16x2 LCD Display. Also when the vehicle is committed to an accident, it will be automatically reported to the nearby police station regarding the accident event in order to file FIR and also the ambulance is automatically booked for rescue the person from an accident.

Keywords: Alcohol, LCD, accident, ambulance.

I. INTRODUCTION

For reducing accidents, the reasons behind it must be understood. According to the records, many accidents occur due to rash driving caused by the alcoholic state of drunken drivers. According to a report presented by the Ministry of Road Transport and Highways Government of India in 2011, 4.97 lakhs of road mishap have occurred, which is 1 accident per minute. Out of which 1.42 lakhs of people were found dead. It is also very common that accident victims do not get medical help in time because of a lack of accidental information to nearby authorities. In some cases, lives could have been saved if the medical team would have arrived timely. There are also cases where mishap occurs due to crossing a certain speed limit. The details of causes of accidents as given by Government of India is due to the driver (77%), weather conditions (1%), vehicle condition (2%), pedestrian fault (2%), cyclist fault (1%), road condition (2%), others (14%). It is also very common where accident victims do not get any medical help in time because of the lack of accidental information to nearby authorities.

An alcohol detection system was developed for road transportation safety in smart city using Internet of Things (IoT) technology. We have developed a alcohol detecting system where a danger light glows which is fixed at the front of the car if the intensity of alcohol is sensed using the analog alcohol sensor. We fixed a 2 threshold value above which the light glows but the intensity of the light is low. If the level of alcohol is high then the light glow with full intensity and a sound from the buzzer is produced to indicate that the car is being driven by the drunken person.

This system aims at ensuring the safety of the other passengers and to inform the police that the driver is drunk. Over the past decade, the use of auto mobiles has improved linearly, which increased the risk of human life. This is because the emergency services are inadequate. We use an alert system in this paper that helps to strengthen the emergency system of the crash system. This device senses the occurrence of the accident and the coordinated accident is reported to the emergency team. Where the car rolled off is shown by a message, This application aims to provide the weak emergency facilities with a suitable alternative. This accident warning system identifies the accident and the location of the accident and sends GPS coordinates to the Smart Phone, device, etc. listed in it. Thus we can provide timely medical aid to the victims.

II. LITERATURE SURVEY

Marwan Hannon et al[1] developed a system, where blood alcohol content of the driver is determined by sampling the alcohol content of the air within a predetermined vehicle zone. A control module is coupled to the detector module to control at least one vehicle operations in response to the electrical signal from the detector module. In another embodiment cell phone contains the detector module and is wirelessly coupled to the control module.

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A vehicle status module is included in some embodiments. Alcohol Detection Sensor. Jones et al[2] provided an automotive safety system, comprising the steps of collecting and analyzing data from the proximity of a potential drive. System comprises an intoxicating substance sensor for detecting the presence of intoxicating substances in a potential drive and disabling the automotive ignition system if the potential driver is determined to be under the influence of intoxicating substances.

Stephanie Sofer et al[3] invented An alcohol monitoring system for monitoring a driver of a car includes a vapor analyzer system for detecting the amount of alcohol in a driver operating the car through hand perspiration. A speed controller is provided for setting the maximum speed of the car to a predetermined level in the event that the amount of alcohol detected in the driver is above a predetermined threshold. Matthew Hogyun Son et al[4] invented a sensor which is a replaceable breath alcohol sensor module that can be replaced with a new pre-calibrated breath alcohol sensor module or re-calibrated. The breath alcohol sensor module requiring calibration can be removed from the body of a Breath Alcohol Testing Device (commonly called “breathalyser” or “breathalyzer”).

Marc A. Deshusses et al reviewed a gas sensing device (nanosensor) includes a Substrate with at least a pair of conductive electrodes spaced apart by a gap, and an electrochemically functionalized semiconductive 7 nanomaterial bridging the gap between the electrodes to form a nanostructure network. depending on the nanoparticles employed in the functionalization, the nanosensor may be used to detect a selected gas. The existing system controls the speed of the car if sensed drunken and the car will be auto-locked and the engine cannot be turned on. This system ensures the safety of the driving person from causing accidents. This system cannot identify the drunken person just by seeing the vehicle.

III. PROPOSED METHODOLOGY

In our proposed project, the entire system is carried out by physical sensors that have been placed in appropriate place in the driver dashboard. Since our proposed system utilizes the sensor models, the time to obtain the desired output is very less when compared to image and video processing methods which requires huge memory and data for processing. And hence our system is much faster in operation. Additionally when the person is consumed alcohol while driving the vehicle, our system will automatically alert the driver “not to drive the vehicle” but still if the driver drives the vehicles, the system will automatically alert the outer world that the car driver is drunken by alert lamp placed on the top of the vehicle. Through this system of methodology the cops on the patrol can easily identify the car which is violating the traffic rules. Also in our system we have deployed vibration impact measuring sensor which is helpful in identifying vehicle which has been met with an accident. Once the vehicle is met with an accident, the alert SMS is automatically sent to the ambulance along with the GPS location embedded in the Google Map through web link.

IV. SYSTEM ARCHITECTURE

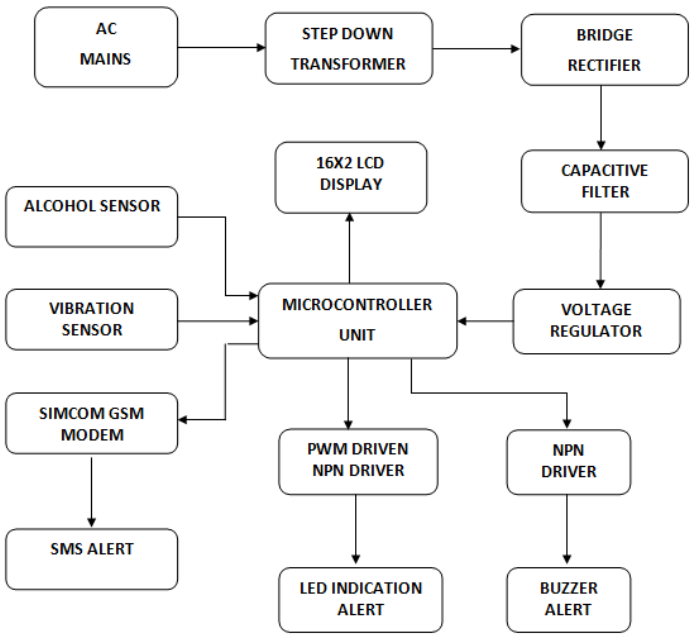

Fig. 1 Dataflow diagram

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The above shown Fig. 1 diagram represents the overall data flow of our project "IOT BASED ALCOHOL ALERT SYSTEM IN CAR WITH GSM MODULE FOR ROAD ACCIDENTS". In the above figure, the AC line is taken from the EB mains and hence it is processed in to the required DC voltage as the microcontroller requires DC supply for its operation. Here we have utilized AC supply whereas in real time, the AC supply is replaced by the Vehicle Battery Source. Initially, the AC supply is taken from the EB mains is passed in to the step down transformer's primary coil and as per the transformers rating, the input AC signal is thus converted to the output AC signal in its amplitude.

Thus acquired lower amplitude AC signal is passed to the Bridge rectifier which is constructed with the help of four 1N4007 diodes in diamond shape circuit which is displayed in the above figure. This process will converts the AC signal to its equivalent rippled DC signal. Since the rippled DC signal cannot be used up by the microcontroller as it requires the stable DC signal, the rippled DC signal is passed to the capacitive filter in the rating of 470uf/25V and the purest form of DC signal is obtained.

Since the acquired DC signal is unregulated DC signal and cannot be used up for the microcontroller due to its in stability, the unregulated DC signal is passed to the linear voltage regulator in order to obtain the regulated constant 5V DC supply for microcontroller operation.

In this model, the analog alcohol sensor is used in order to determine the intensity of alcohol consumed by the driver. If the intensity of the alcohol consumed is very high, the alcohol consumed alert LED will glow in full intensity and likewise if the intensity of alcohol consumed will be sensed low means the alcohol alert led brightness is controlled to its 50% with the help of PWM pulse. Also when the vehicle is met with an accident, the accident alert is sent automatically to the nearby ambulance or hospitals with the help of GSM modem. The accident is determined by the microcontroller unit with the help of vibration sensor. And the piezoelectric buzzer is triggered to alert the nearby persons.

V. RESULT

If the person is drunk, it is identified by the alcohol sensor placed in the vehicle dashboard with the help of an analog-based detector and indicated to the public and police through a danger alert light that is placed in the anterior side of the vehicle along with a sound alarm.

The attached vibration sensor in the vehicle senses the accident impact of the vehicle and sends the signal to the microcontroller unit. Thus, the acquired signal from the vibration sensor is further processed by the microcontroller unit and takes the decision to send the information to the ambulance service along with the GPS location integrated with the GOOGLE maps. The accident report is also automatically sent to the police station with the help of GPS and GSM technology through our project.

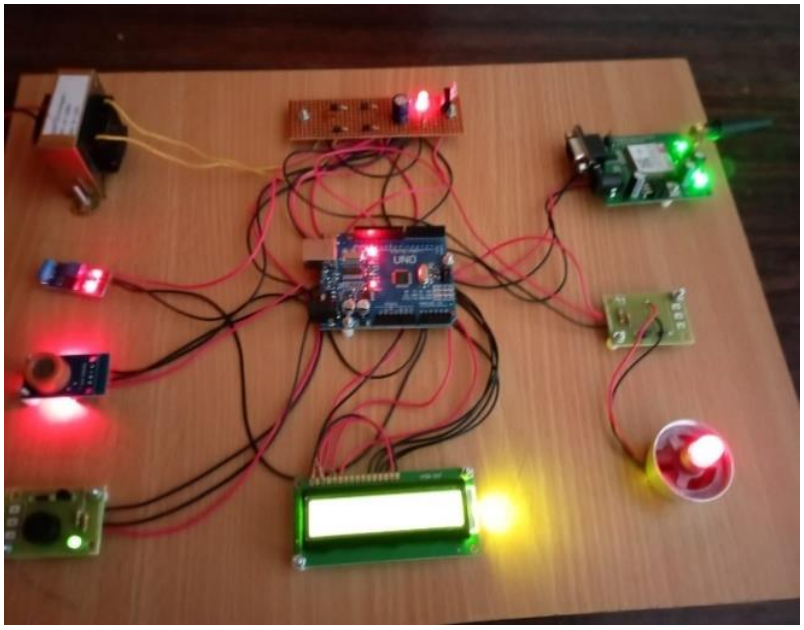

Fig. 2 Hardware Implementation

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The Fig. 2 represents the overall hardware implementation model of our project “IOT BASED ALCOHOL ALERT SYSTEM IN CAR WITH GSM MODULE FOR ROAD ACCIDENTS”.

Fig. 3 Booting Modem Output

The Fig. 3 indicates the time delay given for Modem for Booting up. This time delay is required for GSM modem to acquire network connectivity.

Fig. 4 Alcohol consumed value in percentage

The Fig. 4 represents the intensity of alcohol that has been consumed by the driver.

Fig. 5 LED Indication

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The Fig.5 represents the alert LED given to the outer environment stating that the driver has been consumed alcohol this brightness of LED is adjusted according to the intensity of alcohol consumed by the vehicle driver.

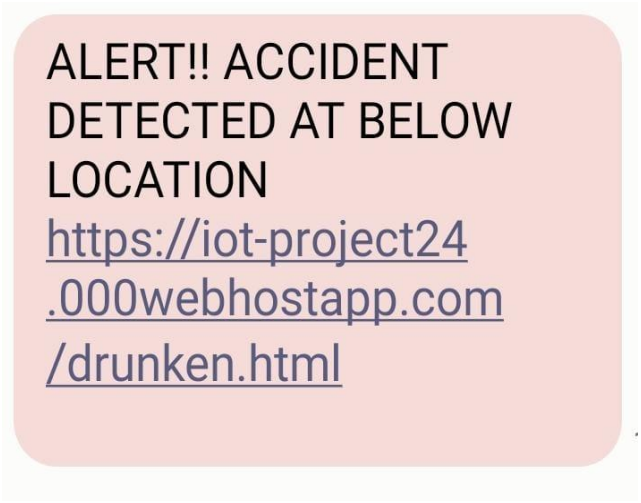

Fig. 6 Alert message to ambulance station

The Fig. 6 represents the alert SMS that has been sent to the ambulance station when the person is met with an accident. In this message it is clearly visible that the URL is defined where the accident has been occurred. Once the ambulance driver clicks on the URL, it will automatically direct to the Google Map pinpointing where the accident has been occurred.

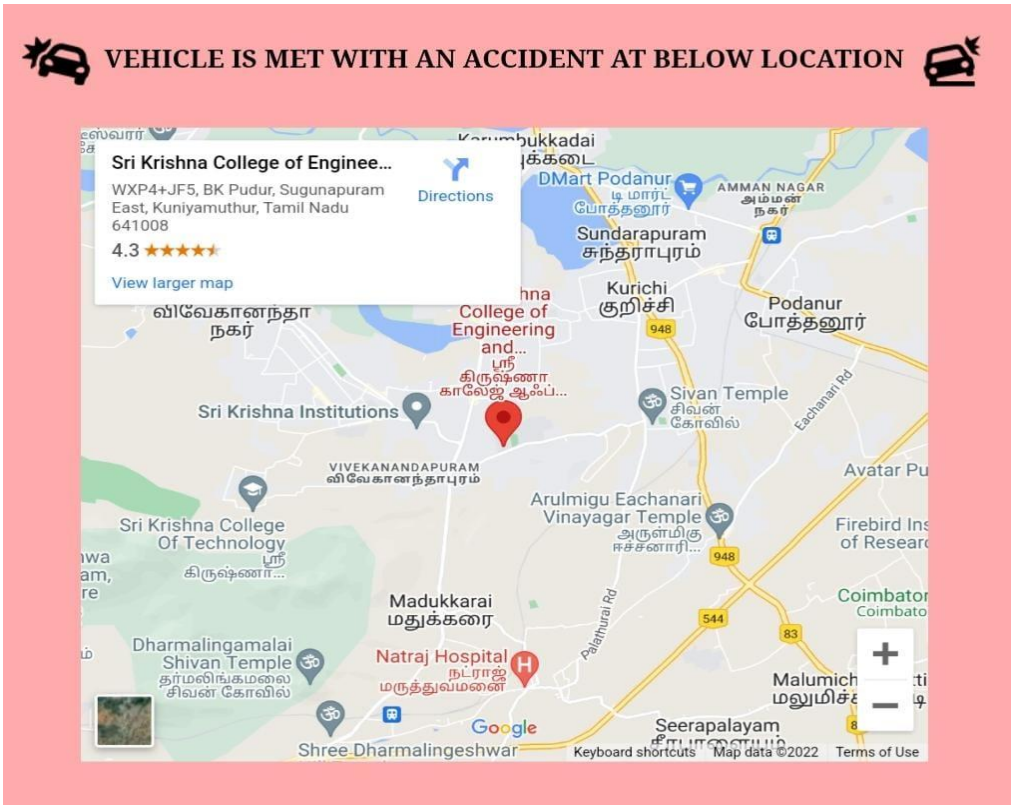

Fig. 7 Google map location of accident

The Fig. 7 represents the Google Map alert stating the place where the accident has been occurred. By knowing the place exactly the driver will automatically put the shortest route through Google Map itself to reach the appropriate destination in right time.

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VI. CONCLUSION

Thus, it helps to identify the drunken driving person just by seeing the vehicle without checking on them by placing an alcohol alert sensor in the dashboard of the car and an alert light along with alert sound is placed in the anterior region of the car that helps the public in recognizing the drunken driving person to make sure of their safety by themselves and also helps in simplifying the work of the police in identifying the drunken driving person. Additionally, an alert message is also sent to the ambulance immediately right after the accident along with live Google map location to save lives in time, with the help of GPS and GSM technology.

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