Alcohol Detection and Vehicle Engine Locking System

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Abstract
The drunk driving is the main reason of accidents of all over the world. Now-a-days the alcohol attributable accidents are increasing rapidly, every year it is reported nearly 2.3 million deaths due to harmful consumption of alcohol. This happens because most of the drunken drivers aren't able to handle the vehicle when they are driving . In our project we propose to solve this problem by designing a system which automatically switches off the vehicle's engine whenever alcohol sensor range reaches to the abnormal level. As soon as the presence of alcohol is detected by the MQ3 sensor the engine of the vehicle will be stopped. After this the location of the vehicle will be tracked by using the GPS technology and the SMS will be sent to the registered mobile number by using the GSM technology. This when implemented in real time saves many lives and losses.
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I. INTRODUCTION

Driving while drunk is hazardous and drivers with high blood alcohol content are at expanded danger of auto crashes road way wounds and vehicular passing. Drunk driving has been listed as the main reason for the fatal vehicular accidents. The accidents caused death more than 50% with drunk driving is concerned. Aimed at the serious Phenomenon of drunk driving in modern society .The main purpose behind this project is "To Reduce Drunk driving". Although many laws in India are prohibiting drivers to drink and drive .But in the ground reality these laws works very poor so people are least bothered about these laws and they are repeating the same mistakes again and again with out any fear . Whatsoever, a keen observation of inebriated drivers could be a very difficult task to the policemen because it is undoubtedly impossible to monitor them every where .So, there is need of a system which can reduce the number of road accidents caused due to drunk driving. In order to mitigate this serious problem "Alcohol Detection And Vehicle Engine Locking System" is designed not only for the safety of the people who are in the vehicle but also for , people in other vehicles or pedestrians too . When this system is installed in a vehicle over the dashboard ,the MQ3 sensor which is present in the system detects the alcohol concentration in the breath air of a person who is in the driver's seat in a vehicle, based on the alcohol sensor output the simulated vehicle presented here with a DC motor, which will be stopped automatically. If the alcohol sensor output reaches the threshold value then the engine of the vehicle will shutdown and the condition ,location of the driver will be sent as a message to the pre registered number using GMS and GPS Technologies. automatic safety system for cars and other vehicles reduces the number of accidents occurring . The innovation introduced here is exceptionally basic, This can be utilized as a demo module, yet ,In real time for genuine applications, we must install genuine sensors which can detect even a very small grouping of liquor fumes present in the air so that we can expect accurate results .

II. LITERATURE REVIEW

Mugila J *et al* [1] proposed a system to prevent the accidents due to drunken driving. Major drawback of this system is that they have used PIC16F877A microcontroller which is not as useful as Nano microcontroller that we are using. The PIC16F877A is a 8-bit 40 pin microcontroller. It has a complex structure so in place of this we are using the Nano microcontroller this nano microcontroller is a very tiny and simple microcontroller. The cost of the nano microcontroller is very less as compared to the other microcontrollers, this nano microcontroller has occupied less space in the system.

Dhivya M *et al* [2] suggests the system to overcome the issue but using MQ2 sensor has come flames. This MQ2 sensor is not authentic and it is best for detecting the methane gas. In place of this MQ2 sensor we are using the MQ3 sensor this sensor is suitable for detecting the ethane gas because the alcohol is mostly contains the ethanol. It can detects the alcohol concentration ranging from 25 to 500 ppm(parts-per-million).

Nimmy James *et al* [3] proposed Health monitoring system based on Raspberry Technology. This system is very expensive and not economical in place of this we are using the GPS and GSM technologies. The cost the both GPS and GSM technologies are less and the GPS technology is used to track the vehicle, the GSM technology is used to send a message to the mobile.

III. PROPOSED METHODOLOGY

The methodology for the project "Alcohol Detection and Vehicle Engine Locking System" in which we use GPS and GSM Technologies can be broken down into the following steps:
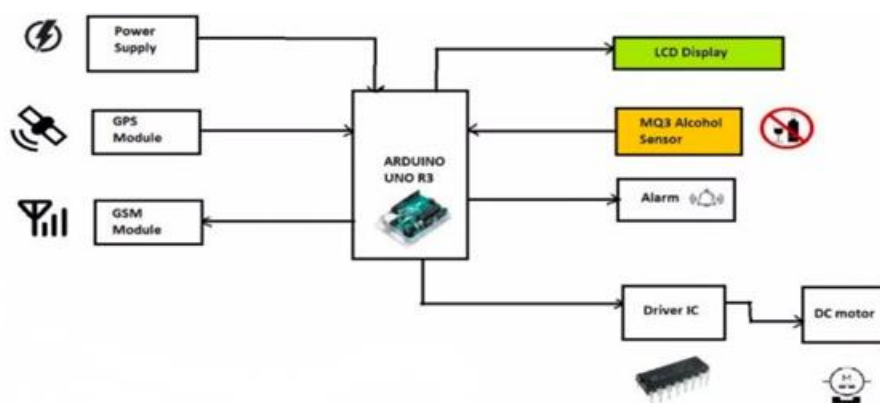

Fig: Block diagram

1.Alcohol Detection System: The first step in the process is to develop an alcohol detection system that can accurately measure the alcohol content in a driver's breath. This system can be based on various technologies such as infrared spectroscopy, semiconductor sensors, or fuel cell sensors.

2.Microcontroller Unit: The next step is to integrate the alcohol detection system with a microcontroller unit, which will be responsible for controlling the locking mechanism and sending alerts via GPS and GSM technologies.

3.GPS and GSM Modules: The system will also include GPS and GSM modules to allow for real-time tracking of the vehicle's location and to send alerts to the designated authorities
or emergency contacts.

4.Software Development: A software program will be developed to manage the system's data and enable the authorized personnel to view the driver's alcohol level, the vehicle's
location, and other relevant information.

5.Testing and Validation: The final step is to test the system thoroughly to ensure that it operates accurately and reliably under all conditions. The system will be validated against various scenarios, and necessary adjustments will be made to improve its efficiency.

IV. WORKING MODEL

The below figure is the working model of alcohol detection and engine locking system , in which the nano micro controller acts as heart of the project all the components like relay, MQ3 sensor ,relay ,GSM,GPS are connected to the micro controller at specified pins as shown in the below figure .This working model is placed at the steering of the vehicle .The MQ3 sensor detects the alcohol range in the drivers breath and sends signal to the micro controller ,and microcontroller sends signals to GSM and GPS to send the SMS to the pre registered number ,with the help of this model we can not eliminate drunk driving but we can reduce drunk driving to some extent .
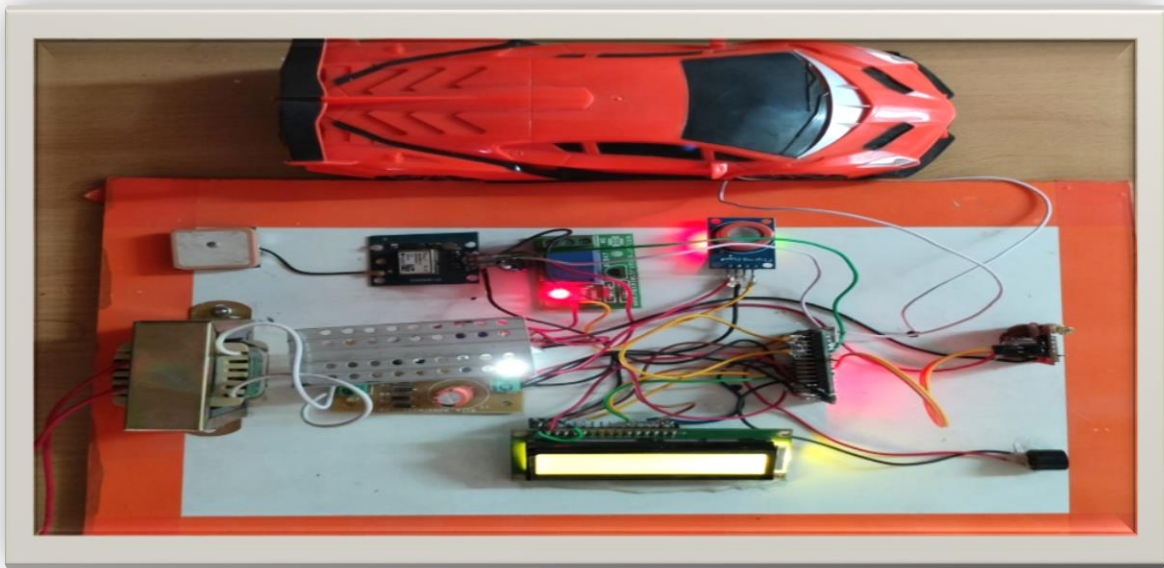
Fig: Working model

V. EXPERIMENTAL RESULTS

Case 1: Under normal condition

The ultimate result for this project on "Alcohol Detection and Vehicle Engine Locking System" could be the development of a prototype device that can detect the blood alcohol concentration of a driver using a breathalyzer and lock the engine if it exceeds a certain threshold.

Fig: LCD when alcohol consumption is within limit

The above figure show us that the alcohol consumption level is within limit that is why LCD display is showing engine is in normal condition. So, engine will not be locked and vehicle runs as usual.
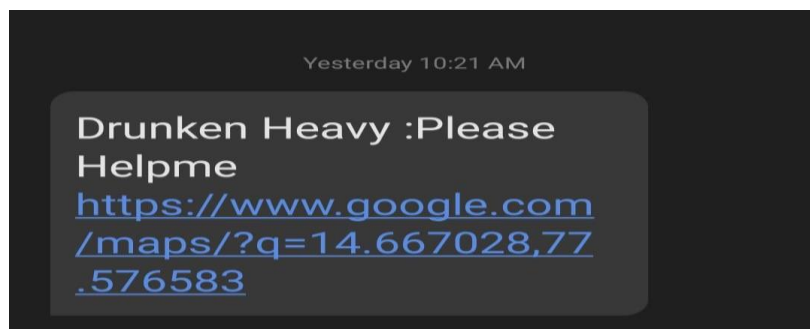
Case 2: Under abnormal conditions

Fig: Sample SMS alert

When alcohol consumption level exceeds the limit, an SMS alert will be sent to the registered mobile number of their guardian, friends whose number is registered so that there will be a high chance of avoiding accidents and the condition of the driver will be to their guardian or friends this helps them to take immediate action to save the drunken driver.

VI.   CONCLUSION

The development of an alcohol detection and vehicle engine locking system using GPS and GMS technology shows great promise in reducing incidents of drunk driving and increasing road safety. The system provides an efficient and effective way to prevent drivers from operating their vehicles while under the influence of alcohol. The accuracy and reliability of the system are crucial factors in determining its effectiveness. Therefore, further research and development should be conducted to enhance the system's accuracy and reliability. Additionally, implementing this system as a standard feature in all vehicles could significantly reduce the number of alcohol-related accidents and fatalities on the road. Overall, the alcohol detection and vehicle engine locking system using GPS and GMS technology has the potential to save countless lives and prevent injuries resulting from drunk driving. It is an important step towards creating a safer driving environment and should be considered for widespread adoption.

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