VEHICLE THEFT, DRUNK AND DRIVE DETECTION SYSTEM USING GSM AND GPS

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Abstract

Local offenses are said to yearly drift around 10 million. Of this, vehicle burglary beats the rundown and frequently happens in all regions of the planet. Numerous late advances are developing and new techniques are being moved up to beat this issue. The techniques associated with vehicle burglary discovery have become mindful to everybody including the robbers and they attempt to break the framework and take the vehicle. This paper proposes a framework introducing a system to limit vehicle robberies & theft. The framework gives security by sending an alert message as soon the vehicle is taken or moved without information on the proprietor. The framework additionally offers clients about alcohol detection to enhance security measures. This arrangement for burglary vehicle and alcohol detection consists of Arduino Uno, Alcohol (MQ-3) sensor along with GSM & GPS module. GPS innovation is used to send locations. GSM innovation is utilized to send an alert message to hint to the proprietor when the vehicle is begun and the alcohol level is detected. The GPS is the abbreviation for Worldwide situating framework. This GPS beneficiary is equipped for distinguishing the area wherein it was available as scope and longitudes. The GPS gives the information obtained from the satellites. For this data, the GPS speaks with something like three satellites in space.

Keywords: - GSM, GPS, MQ-3(Alcohol Sensor), Arduino Uno.

1. INTRODUCTION

Lately, vehicle theft and road accidents due to drunk & driving are been considered a major issue. The assurance of the vehicle is required. There are likewise a few hurdles and a portion of the more costly ones. In this manner, a successful security vehicle is required. This undertaking identifies the vehicle robbery. The Arduino connection point is a fundamental part of the DC engine and GPS. A remote constancy module is utilized to look throughout the vehicle's area through the Worldwide Situating Framework (GPS). GPS might be a route framework that will be adapted to track the vehicle, and it gives the position of the

destructive gadget by and large weather patterns. Exploitation of the GPS radio wire gives the scope and meridian of the gadget. At the point when we leave the vehicles outside, right now assuming the vehicle is taken, the D.C. engine turns over and accordingly, the technique on top is finished and the data is conveyed through the web content. The utilization of vehicles in the present time is compulsory.

At the indistinguishable time, vehicle take a day is that the speediest developing day in extent connection. Thus, vehicle insurance from robbery is vital. Avoidance of vehicles is frequently finished by approving proprietors and by building a hostile-to-robbery framework in vehicles.

2. LITERATURE SURVEY

Because the number of accidents are increasing day to day, continuous monitoring and tracking of the accidents is necessary. The root cause of this is drunkenness, drowsiness of the driver, and irrelevant behavior of the vehicle.

In the past few years many technologies have been introduced to protect vehicles from drunk driving. The system contains a Raspberry Pi microcontroller along with camera and alcohol sensor to detect the face car driver along with the alcohol level concentration [1]. In the system along with Arduino, GSM, GPS a Wi-Fi module is introduced for integrating the system with internet [2][5]. Combined GSM & GPS technologies provides a particular theft location of the vehicle to the authority or owner [3]. Smart technology is implemented introducing a RF module to store the data of theft and alcohol concentration in the cloud [4]. A real time model has been developed that can automatically lock the engine when a drunken driver tries to ride a car [6].

To overcome the drawbacks and failures of the system a framework is implemented to provide a solution to the above issues with certain content and continuous monitoring of alcohol consumption level of the driver in this paper.

3. IMPLEMENTATION

Driving under the influence is a significant reason for street mishaps. Be that as it may, successful checking of plastered driving is trying for the police officers and street security officials. Tipsy driving is one of the significant purposes for street mishaps around the world. In all of the street mishap cases, overall drivers have been seen to approach alcohol content in their blood. The framework presented by us targets lessening the street mishap in the future because of drunk & drive.

This paper presents the advancement in utilizing the alcohol discovery and motor locking system when any theft occurred by utilizing Arduino Uno associated with GSM and GPS for giving precise areas. The framework considers programmed detecting of alcohol in inhale we likewise utilize an engine to exhibit as a vehicle. We utilize a GPS module with GSM Sim 800l to send SMS messages to the concerned individual on the off chance that an alcohol level is identified. The framework comprises an Arduino Uno alongside an MQ-3 alcohol sensor for recognition of alcohol content in the air of the user and GSM, a GPS module for warning the authority.

At the point when the framework identifies the presence of alcohol in the air which the driver or user released for checking if the level of alcohol content is detected then the framework quickly locks the motor of the vehicle.

The block diagram for the framework is shown in the Fig: -1 &Hardware Connections of the framework is displayed in Fig: -2.

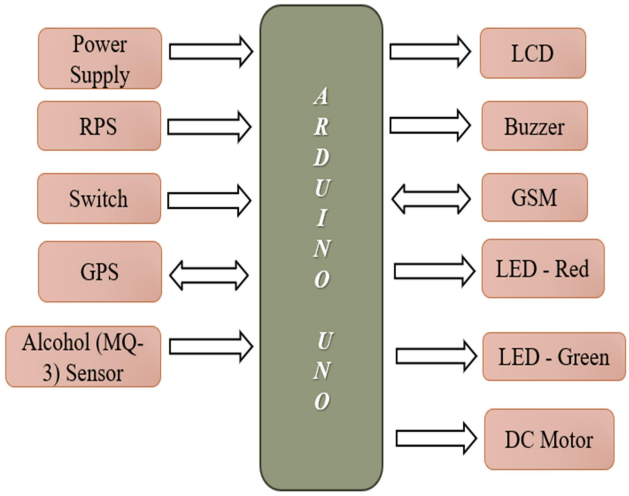


Fig: -1 Block Diagram of the proposed framework

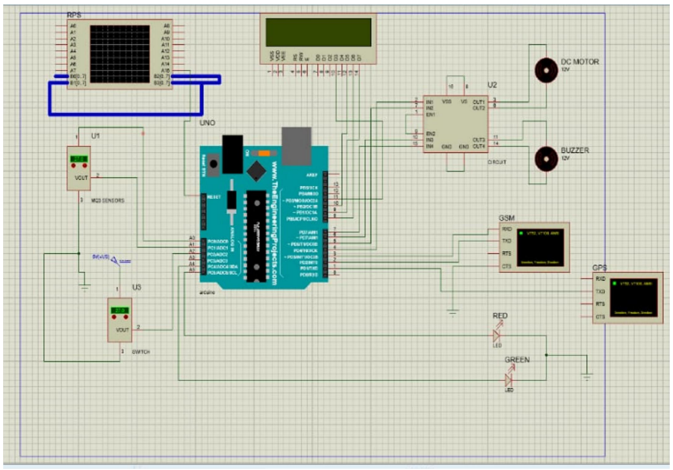


Fig: -2 Circuit diagram with Hardware Connections

4. OPERATIONAL WORK FLOW

For the case of alcohol level detection, the alcohol sensor (MQ-3) plays a vital role for detecting the alcohol content present the air released by any person. The flow of work of the alcohol detection system is as shown in Fig: -3.

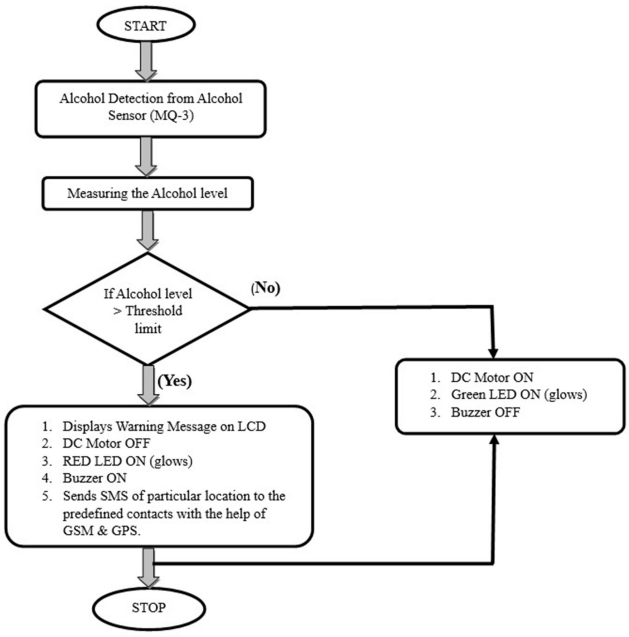


Fig: -3 Flow chart for Alcohol detection system.

Whereas in the Vehicle theft scenario there is no work of alcohol sensor. The flow of work is mean for distinguishing any unexpected event happened without the authorized person. The operational work flow of the vehicle is as mentioned in Fig: -4.

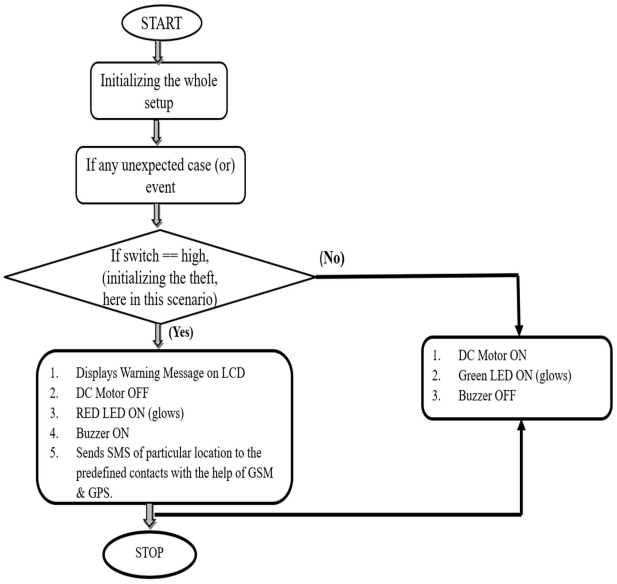


Fig: -4 Flow chart for Vehicle Theft detection system.

5. DESCRIPTION OF COMPONENTS

The essential components of the frame work are explained in detail. They are as follows:

ARDUINO UNO

The Arduino Uno is a microcontroller board in light of the ATmega328 (datasheet). It has 14 computerized input/yield pins (of which 6 can be utilized as PWM yields), 6 simple data sources, a 16 MHz clay resonator, a USB association, a power jack, an ICSP header, and a reset button as shown in Fig: -5. It contains everything expected to help the microcontroller; just interface it to a PC with a USB link or power it with an air conditioner to-DC connector or battery to get everything rolling. The Uno varies from all first sheets in that it doesn't utilize the FTDI USB-to-chronic driver chip. All things being equal, it includes the Atmega16U2 (Atmega8U2 up to form R2) customized as a USB-to-chronic converter. Correction 2 of the Uno board has a resistor pulling the 8U2 HWB line to ground, making it simpler to place into DFU mode. Amendment 3 of the board has the accompanying new highlights.

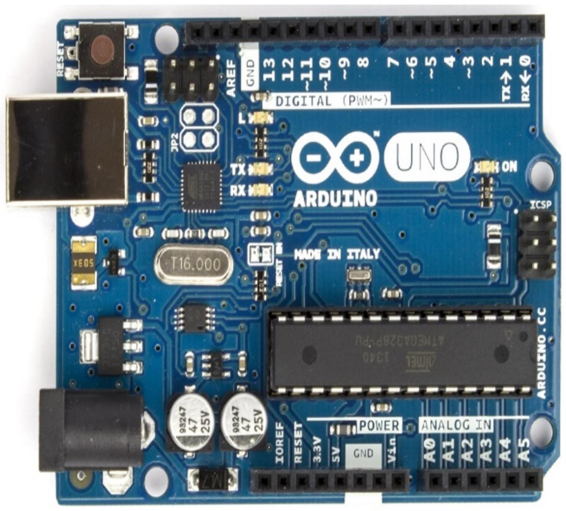


Fig: -5 Arduino Uno Board

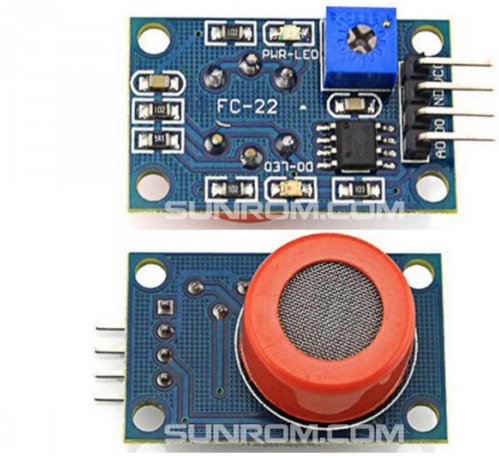
LCD (Liquid Crystal Display)

Fluid Precious stone Presentation likewise called as LCD is extremely useful in giving UI as well with respect to troubleshooting motivation. The most usually utilized Character put together LCDs are based with respect to Hitachi's HD44780 regulator or other which are viable with HD44580. The most usually utilized LCDs found in the market today are 1 Line, 2 Line or 4 Line LCDs which have just 1 regulator and backing all things considered of 80 characters, while LCDs supporting in excess of 80 characters utilize 2 HD44780 regulators. The 16*2 LCD of 2 line is shown in the Fig: - 6.

*Fig: -6 LCD (16*2)*

MQ-3 Alcohol Sensor

It is a low-cost semiconductor sensor which can detect the presence of alcohol gases at concentrations from 0.05 mg/L to 10 mg/L. The sensitive material used for this sensor is SnO2, whose conductivity is lower in clean air. Its conductivity increases as the concentration of alcohol gases increases. It has high sensitivity to alcohol and has a good resistance to disturbances due to smoke, vapor and gasoline. This module provides both digital and analog outputs. MQ3 alcohol sensor module can be easily interfaced with Microcontrollers, Arduino Boards, Raspberry Pi etc. This alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyzer. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration. The drive circuit is very simple, all it needs is one resistor. A simple interface could be a 0-3.3V ADC.



The essential picture of the MQ-3 sensor is displayed in the beneath Fig: -7.

Fig: -7 MQ-3 Alcohol Sensor

BUZZER

A ringer or beeper is a sound flagging gadget, which might be mechanical, electromechanical, or piezoelectric. Regular purposes of ringers and beepers incorporate caution gadgets, clocks and affirmation of client information, for example, a mouse snap or key stroke. Bell is a coordinated construction of electronic transducers, DC power supply, broadly utilized in PCs, printers, copiers, alerts, electronic toys, auto electronic gear, phones, clocks and other electronic items for sound gadgets. Dynamic ringer 5V Evaluated power can be straightforwardly associated with a nonstop solid, this part committed sensor extension module and the board in mix, can finish a basic circuit plan, to "fitting and play."

The overview of buzzer as displayed in the Fig: -8

Fig: -8 Buzzer

SWITCH

A switch is an electrical part that can detach or associate the directing way in an electrical circuit, interfering with the electric flow or redirecting it from one transmitter to another. The most widely recognized kind of switch is an electromechanical gadget comprising of at least one arrangements of portable electrical contacts associated with outside circuits. At the point when a couple of contacts is contacting current can pass between them, while when the contacts are isolated, no current can stream. Switches are made in a wide range of designs; they might have different arrangements of contacts constrained by a similar handle or actuator, and the contacts might work all the while, consecutively, or on the other hand. A switch might be worked physically, for instance, a light switch or a console button, or may work as a detecting component to detect the place of a machine part, fluid level, strain, or temperature, like an indoor regulator.

Many particular structures exist, one of them is as shown in Fig: -9. For example, the flip switch, revolving switch, mercury switch, press button switch, turning around switch, transfer, and electrical switch. A typical use is control of lighting, where different switches might be wired into one circuit to permit helpful control of light installations. Switches in powerful circuits should have exceptional development to forestall horrendous arcing when they are opened.

Fig: -9 Switch

GSM(Global System for Mobile Communication)

SMS is a portable correspondence modem; it is representing worldwide framework for versatile correspondence (GSM). The possibility of GSM was created at Chime Labs in 1970. It is generally involved versatile correspondence framework on the planet. GSM is an open and advanced cell innovation utilized for sending portable voice and information administrations works at the 850MHz, 900MHz, 1800MHz and 1900MHz recurrence groups. GSM framework was created as a computerized framework utilizing time division various access (TDMA) method for correspondence reason. A GSM digitizes and diminishes the information, then sends it down through a channel with two unique surges of client information, each in its own specific time allotment. The computerized framework has a capacity to convey 64 kbps to 120 Mbps of information rates.

There are various cell sizes in a GSM system such as macro, micro, pico and umbrella cells. Each cell varies as per the implementation domain. There are five different cell sizes in a GSM network macro, micro, pico and umbrella cells. The coverage area

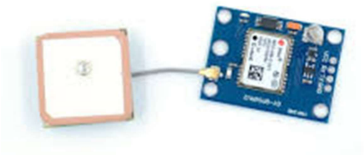
of each cell varies accordingly. The structure of GSM SIM900A is as shown in the Fig: -10.

Fig: -10 GSM Modem

GSM sends the SMS to the user by the help of GPS innovation known as trilateration for tracking the position of the vehicle of that area.

GPS (Global Positioning System)

GPS stands for Global Positioning System by which anyone can always obtain the position information anywhere in the world. The essential picture of the



GPS module is as shown in the Fig: -11.

Fig: -11 GPS module

(Trilateration: It is a surveying technique used to determine the position or location of a point by measuring distance to known reference points.)

The formulas required for finding location of 2D co-ordinates by a GPS are shown in the below Fig: -12.

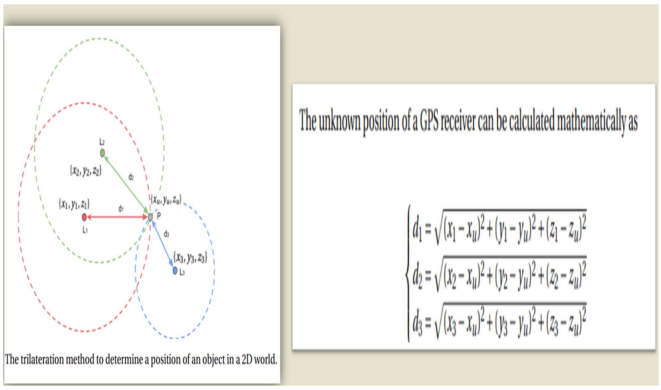


Fig: -12 GPS location fetching equations

ARDUINO IDE

Arduino IDE (Integrated Development Environment) is required to program the Arduino Uno board. The overview sketch of Arduino IDE is as mentioned in below Fig: -13.

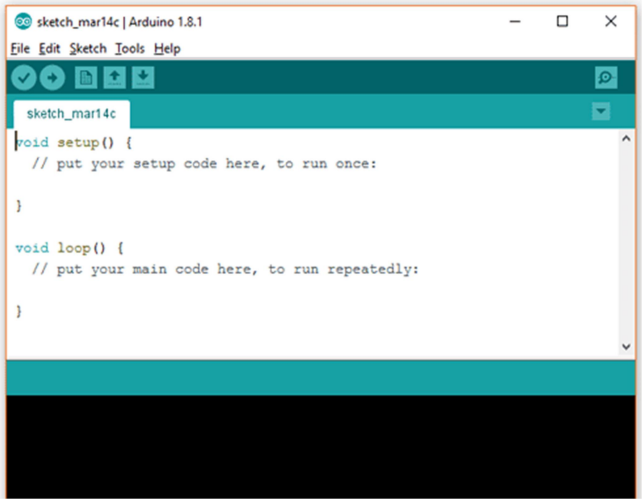


Fig: -13 Arduino IDE Sketch

Programming Arduino:

Once Arduino IDE is introduced on the PC, interface the board with PC utilizing USB link. Presently open the Arduino IDE and pick the right board by choosing Tools>Boards>Arduino/Genuino Uno, and pick the right Port by choosing Tools>Port. Arduino Uno is modified utilizing Arduino programming language in view of Wiring.

To kick it off with Arduino Uno board and squint the implicit Drove, load the model code by choosing Files>Examples>Basics>Blink. When the model code (likewise displayed underneath) is stacked into your IDE, click on the 'transfer' button given on the top bar. Once the transfer is done, you ought to see the Arduino's underlying Drive flickering.

6. EXPERIMENTAL RESULTS

The overall model implementation of the framework is displayed as Fig:14. And the graphical, SMS results are displayed as Fig:15 & 16.

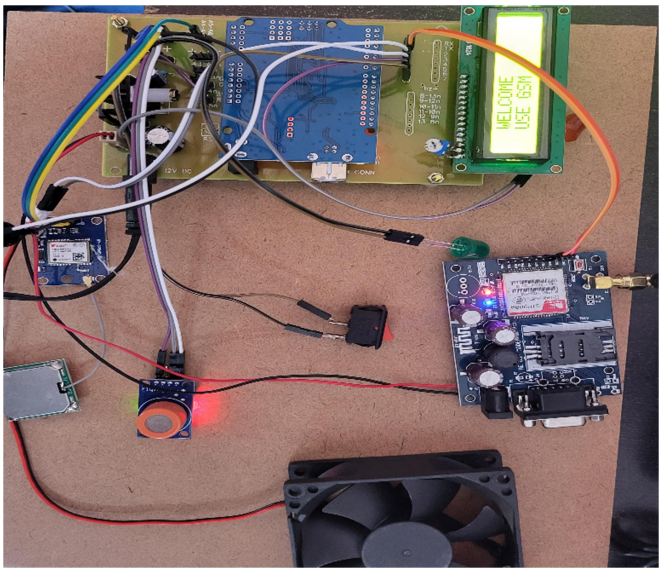


Fig: -14 Framework model

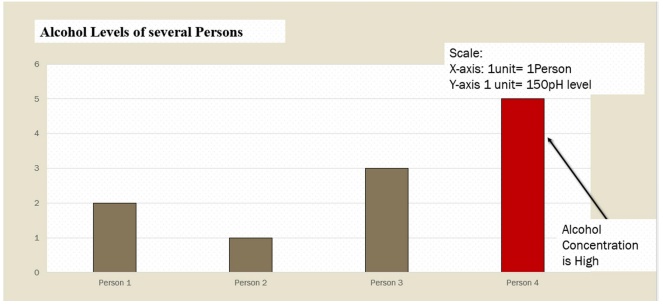


Fig: -15 Measured alcohol levels of different persons.

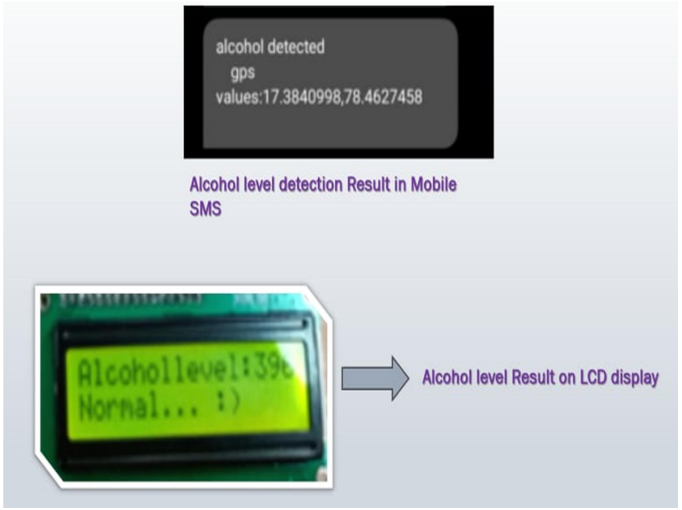


Fig: -16 Results on LCD & SMS to Phone

7. CONCLUSION

This undertaking is planned as a framework to give a total answer for transport-related issues, for example, mishap alerts and vehicle robberies. It is proposed as a minimal expense improved arrangement utilizing GSM and GPS innovation. A powerful arrangement is given to foster the shrewd framework for vehicles which will detect the different degrees of liquor present in the breath of the driver and would answer appropriately. The framework took on various standards as made sense of in this paper, by utilizing the equipment stage whose Center is Atmega8, Liquor sensor mq3, GPS, and GSM module. The correspondence with preregistered telephone numbers in this planned framework is done through GSM, GPS, and control of different boundaries. The entire control framework has the advantage of a little volume and high unwavering quality.

The future extent of this framework is to diminish mishap numbers and give helpful insights concerning the incidental vehicle, accordingly decreasing the pace of mishaps occurring because of tipsy driving. This framework acquires modernization to the current innovation of the vehicles and furthermore keeps up with and further develops the security highlights, subsequently ending up a powerful advancement in the car business.

Advantages:

- The alcohol detection with an engine locking system can be implemented in any 4-wheeler.
- The Government can track drunken driving cases.
- It can provide quick & accurate results.
- Chance of life & property can is minimized.
- Warning the nearest authority using the GSM module will provide accurate information for a specific vehicle located using a GPS tracker.

Disadvantages:

- Breath analyzers using alcohol detection are available at high prices.
- They have a shorter lifetime.
- Breathe analyzer requires continuous recalibration.
- Damage to sensors can't be detected.

8. FUTURE SCOPE

***Stolen Vehicle Recovery*:** One of the primary applications is to facilitate the recovery of stolen vehicles. These systems often utilize GPS technology to track the location of the stolen vehicle, enabling law enforcement to quickly locate and recover it.

***Preventive Measures*:** Vehicle theft detection systems act as a deterrent to potential thieves. The presence of visible anti-theft devices or alarms can discourage thieves from attempting to steal the vehicle in the first place.

***Insurance Premium Reduction*:** Many insurance companies offer discounts for vehicles equipped with anti-theft devices. Installing a theft detection system can lead to lower insurance premiums, saving money for vehicle owners.

***Fleet Management*:** In commercial settings, such as logistics companies, vehicle theft detection systems are crucial for monitoring and safeguarding fleets of vehicles. This ensures the security of valuable assets and prevents disruptions to operations.

***Prevention of Accidents*:** One of the primary goals of drunk driving detection systems is to prevent accidents caused by impaired driving. By accurately detecting signs of intoxication in drivers, these systems can alert drivers or authorities, potentially preventing a dangerous situation.

***Law Enforcement*:** Drunk driving detection systems can assist law enforcement agencies in identifying and apprehending impaired drivers. This helps in enforcing drunk driving laws and reducing the number of incidents on the road.

Ignition Interlock Devices: In some jurisdictions, individuals convicted of drunk driving may be required to install ignition interlock devices in their vehicles. These devices prevent the vehicle from starting if the driver's blood alcohol concentration (BAC) is above a certain threshold.

Public Transportation Safety: Drunk driving detection systems can be integrated into public transportation systems, such as buses or trains, to ensure the safety of passengers and other road users. Operators can be alerted if a driver shows signs of impairment, allowing for timely intervention.

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