RESEARCH ARTICLE   OPEN ACCESS

Pollution and Alcohol Level Based Automobile Ignition System

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Abstract:

The purpose of this project is to decrease the death rate due to accidents caused by drunk driving. This project also keeps the pollution level of the atmosphere by checking the vehicle smoke level using MQ2 sensor. We used MQ3 sensor for driver alcohol level detection and if the level of alcohol in permissible the ignition gets on otherwise the vehicle will not start. In this project, we have used ATMEGA328 microcontroller to process the inputs and outputs based on the conditions. An LCD display is used to display the status of the vehicle. GSM module is used to send messages for the family members if the person is drunk and the location of the person is obtained by using the GPS module. The Latitude and Longitude of the location are sent to family members by GSM. In this project, the engine is demonstrated by using the dc motor.

Keywords**: MQ2 sensor, MQ3 sensor, air pollution, Latitude and Longitude, GSM and GPS**

INTRODUCTION:

From the guidelines of World Health Organisation,"The immediate effects of alcohol on the brain are either depressing or stimulating in nature, depressing on the quantity consumer". It also says that consumption of alcohol above the normal range "results in an impairment which increases the likelihood of a crash since it produces a poorjudgment, increased reaction time, lower vigilance and decreased visual activity acuity. Physiologically, alcohol also lowers blood pressure and depresses consciousness and respiration. Alcohol can impair judgment and increases the crash risk even at relatively low Blood Alcohol Concentration (BAC) levels. However, the effects become progressively worse as the BAC increases".

Pollution through vehicles has gradually increased due to vehicular exhaust in developed areas is particularly in large letter, this resulted in a serious issue. We can easily seethe pollution rate from vehicles which leads to Lungs infection, Respiratory problems, and various bronchial and visibility problems.

The pollutants released from the automobiles are CO2, lead or CO, SO2,

NO2 and C6H6. The pollution through vehicles in the cities is due to the pure engine and fuel quality and improper maintenance etc.

ADITYA MADHAB BARUAH, RITURAJ CHARIHA [1] proposed a study of the incidence of Alcohol use in Fatal Road Traffic Accidents. They describe those accidents that occurred due to the traffic issues are the main reason in the loss of many lives and property which are resulting in economic rate. The death of the people every year due to road accidents has raised to the 150,000 mark. From the report of the National Crime Records Bureau (NCRB) states,that drunken driving is the actual cause of road accidents. It is reported in India that 25% of accidents occur due to drunken driving.

ALEENA MARY ANSON, DR.KARANJIT [2] had proposed a review on the automated pollution control system in vehicles. In many countries, most of the people travel daily for work. In this present Era, most of the people have their own vehicles like cars, 2 wheels etc. The major issue of these automobiles is air pollution. Each vehicle has to emit gases, which is due to the combustion of fuel. To a particular limit, this emission of gases due to combustion is not the major reason to cause pollution. The actual pollution problem occurs when these gases emit above the standard limits. The main reason for the emission of gases is the improper fuel combustion that supplied to the engine.

NAGENDRA BABU, H. CHANDRA SHEKHAR [3] has proposed Automated System for Controlling Air Pollution in vehicles using ARM7 Micro Controller. The entire system is dealtfor two reasons. The main reason is the amount of identifying and controlling the limit of gases that cause pollution and directing it to the person who is driving the automobile. The next reason is that this system is the biggest achievement in technology, which keeps the Environment safe from gases that are emitting from automobiles. In addition, it will control it when it crosses the standard mentioned by Government. Actually, this system cannot change the engine configuration but it is easy to employ in vehicles.

HARNAM SINGH, A.D.AGGARWAL [4] had proposed a review on Fatal Road Traffic Accidents among young children. In this review, they mentioned that in many nations around the world, accidents are the main reasons for death. Around 20% of all unnatural deaths worldwide occur in children under 15 years old. Road accidents account for 21% of all death in this age group. These road accidents and death in children is almost due to the negligence of a child was considered to be fault. They conducted a study in which under 65 children aged are teenagers died due to road accidents out of four hundred and fifty cases out of which 80 percent were males and 16 percent were females. The common age group is around twenty years.

NAMITHA SHINDE, AMRESH GIRI, SWATI RIMA, PARUL SINGH [5] has proposed Alcohol Detection and Vehicle engine Locking System. In this paper, they have developed a kit, which is used to trace

the occurrence of drunken driving. The main idea is to reduce the occurrence of accidents that results in loss of people life and property this system when adjusted on automobile alert the person who is driving by turning off the engine. Moreover, informing the nearby people by sending messages. By turning off the engine, it does not allow the drunken person to drive which helps in reducing the accident rate.

GPS: GLOBAL POSITIONING SYSTEM

GPS module is used to obtain the location where the vehicle is located. We will receive the Latitude and Longitude value of the location through GSM [6] when the person is found drunk. In addition, this GPS continuously tracks the vehicle location.

Global System for Mobile Communication is a standard developed by European Telecommunications Standard Institute (ETSI) to describe the protocol for second generator (2G) digital Cellular networks used by mobile devices. In this project, we need GSM to send the message to the registered person when the driver is found drunken by the system. It is also used to stop the engine by sending #1 command to the GSM using the registered mobile number[8].
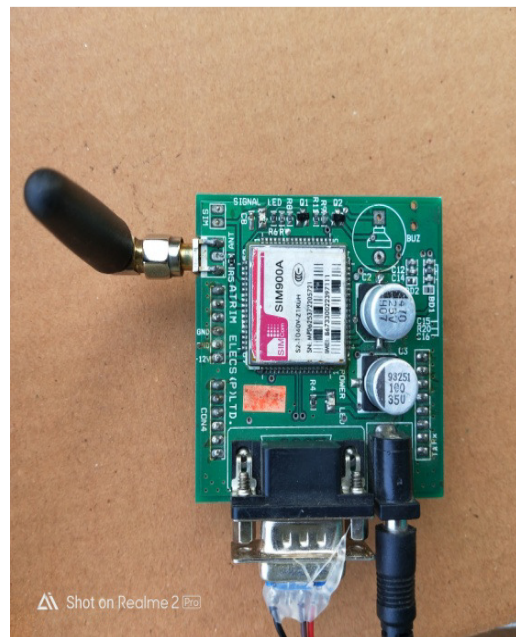

Figure-1: GSM Module

COMPARATOR:

In this project, we have used LM358-IC, which is an 8pin IC. It has very good low power and it is very easy to use dual channel OP-AMP IC. In this project, this compares the obtained value with the threshold value [7]. We also used two Potentiometers for a threshold value.
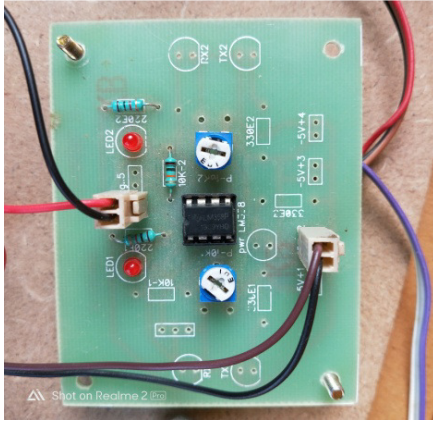

Figure-2: GPS Module

GSM:

Figure-3: Comparator Board

MAX 232N:

In this project, we used 232N for serial communication from GSM to the MAX 232. We used MAX 232N for TTL logic to convert 232 to TTL logic to send to Arduino. In this 232N i.e., -12v to 12v logic is converted to TTL logic -5v to +5v.
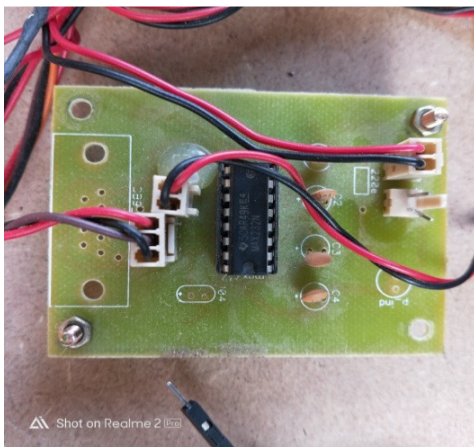

Figure-4: MAX 232N Board

PROBLEM IDENTIFICATION:

According to WHO (World Health Organization), 50 to 60% of accidents are due to drunk and driving. People when they drunk over than the normal range they go to the unconscious stage. They do not have command over their body. In this condition, if they drive a vehicle that may lead to an accident. Sometimes these accidents may cost their lives, which is a great loss to their family and friends. In our daily life, we observe many incidents that occur due to drunk driving which is a challenging issue to be addressed. Another issue that is to be noticed is the harmful gases from vehicular exhaust. They are also polluting the air. This pollution is a global issue [9]. Due to these dangerous gases, ozone layer is depleting every day. As the ozone layer is, depleted harmful IR rays are directly contacting the earth surface these are resulting in many diseases. In recent incidents nearly, many people died due to inhaling the polluted air. The only solution to these problems that are generated in the automobile can be solved by using our proposed method.

PROPOSED SYSTEM:

By considering all the parameters of accidents due to drunken driving and pollution level due to vehicular emission and eliminating the drawback of methods used earlier, the Pollution and Alcohol-based Automobile Ignition System helps to reduce the accidents and save lives. It also reduces the burden of government to control pollution due to vehicle emission.
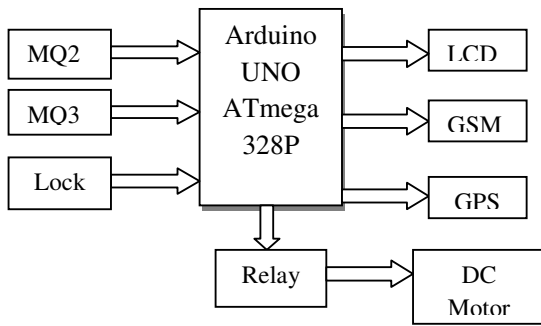
Figure-5: Block Diagram of the project.

OVERVIEW OF THE PROJECT:

The system is programmed using the Arduino IDE associated with all the electronic and electrical components. In this system, the two sensors MQ3 and MQ2 continuously monitors to ignite the motor.The program is designed to continuously monitor Alcohol sensor and smoke of the vehicle when the Ignition key is ON. If the alcohol (or) smoke is detected and more than the threshold level, the comparator compares them and the GSM module sends the message with the location (Latitude and Longitude) values got from GPS to the registered mobile number. After the detection of any of the three or conditions is false i.e., OFF the relay remains off thereby the ignition gets off. If all the conditions of the program are satisfied then the relay gets ON and the ignition gets ON.If the person is drunk in the middle of the system then also the vehicle gets off as the system continuously monitor the smoke and compares them using a comparator.

The LCD is used to display the status of the project. This LCD indicates the systematic procedure that is going on in the system [10].When a message with #1 is sent to the registered mobile number, the vehicle forcibly gets off. This mechanism is used when our vehicle stolen by anyone.

RESULTS:

Initially, the system asks to register a mobile number to make the GSM send a message to that registered mobile number. We need to register the mobile number by giving *986618xxxx to the sim available in GSM. After the mobile number registering, we will get an SMS to the mobile phone as shown in fig.6.

Figure-6: Module showing registered mobile number.

Next, we need to turn ON the ignition key. The alcohol sensor and smoke sensor checks for alcohol and pollutants are in limit then the microcontroller turns ON the relay and thereby the motor (Engine) gets started.

The status of key, alcohol sensor and the LCD display as shown in the fig.7

Figure-7:Showing the status of Sensors and Key.

If the alcohol and pollutants are not on a limit then the microcontroller turns the motor (engine) gets OFF. The status of the key, alcohol sensor and smoke sensor and the relay are shown on the LCD display as shown in the fig.8

Figure-8: Showing sensors are ON and OFF.

The status of the vehicle is continuously sent to the registered mobile number.

If the vehicle engine is turned OFF due to over alcohol level or smoke level (or) key is in OFF state an SMS showing "vehicle is turned OFF" and also the location (Latitude and Longitude) values are also sent as shown in fig:9
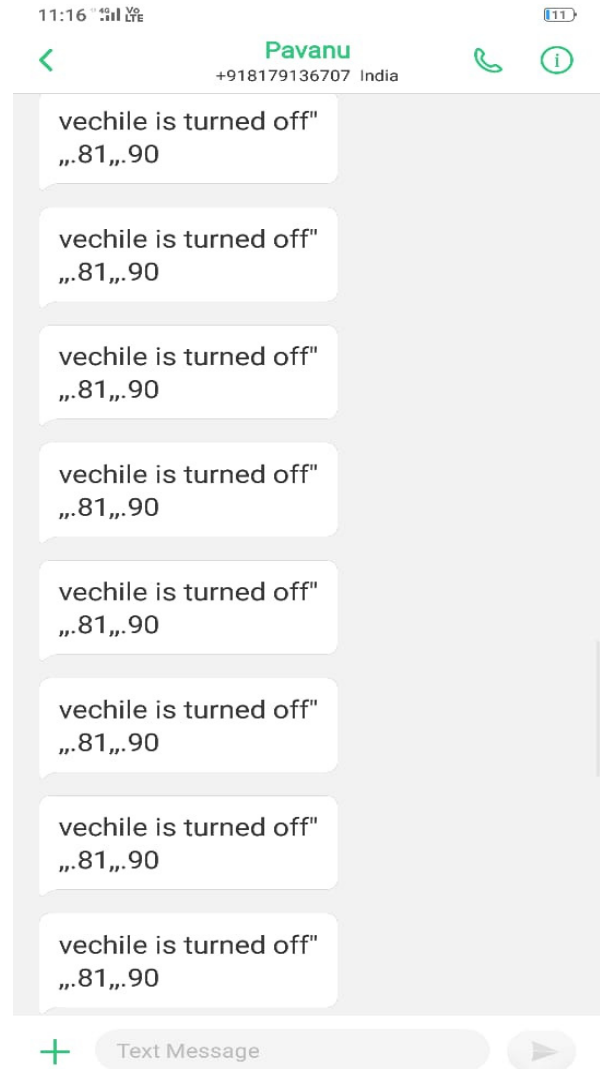

Figure-9:Showing the status of the vehicle.

If the vehicle engine is turned ON due to the permitted alcohol level or smoke or key is in ON state an SMS showing "Vehicle is turned ON " and the location is sent as shown in the fig10
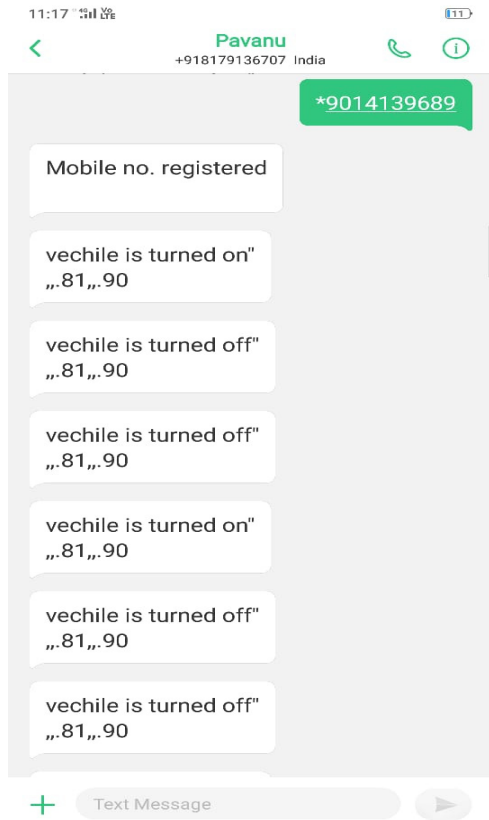
Figure-10:Showing the status and location in the registered mobile number.

CONCLUSION:

The Technologies that are used in this system are adequate to make certain practical and perfect alcohol and pollution based automobile ignition system. The system is computable to any of the market. The system is capable of monitoring alcohol and pollutants of the vehicle continuously using ATMEGA 328 Micro Controller (Arduino UNO). The system consists of a 12v relay circuit to which dc motor that demonstrates the engine of the vehicle. This developed system is used to prevent road accidents causing due to drunken driving. This system also helps in reducing the pollution level of the environment by monitoring the pollutants of the vehicle using anMQ2 sensor.
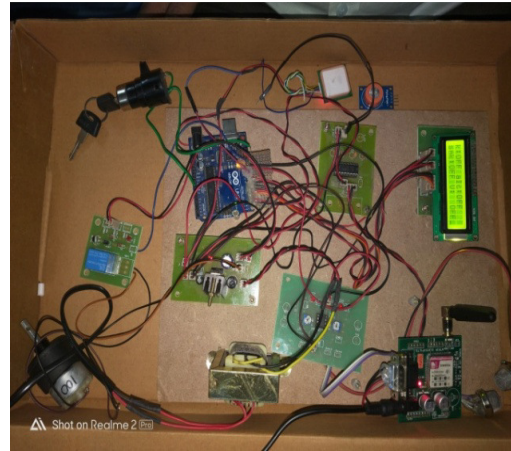

Figure-11: Complete setup with working.

FUTURE SCOPE:

1) In case the driver feels sleepy while driving, the object and amazing module of the sensor will analyze his eye moments and vehicle will not start.
2) An Infrared feature can be used to avoid a problem if the driver acts smart to fool the system.
3) The system can be implemented to send a message to the police station in case any accident happens.

ACKNOWLEDGMENT:

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