

Smart Car with Driver Alert System

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Abstract - Nowadays, pollution has been increased in India up to extreme level due to which people are suffering from lots of health issues and even sudden deaths which is not good. 60 to 70 percent of air pollution occurs due to vehicles running on the road and harmful gases emitting from them. Also some cases of accident occur due to drink and drive which is a serious public health problem. Road safety has become another major issue in India.

Proposed system will try to overcome this problem which occurs due to vehicle gases. Many a times driver does not come to know about that the large amount of gas is leaked which becomes problematic for the people travelling around the vehicle. So to overcome that gas leaked problem we have come across the solution.

Project consist of MQ2 sensor which sense the harmful gases and if the amount of gas is increased from the given threshold then it will start the GSM module to send the message to the driver to alert him about the harmful gas which vehicle is throwing. [1] The system also consists of MQ3 sensor which detects the presence of alcohol in vehicle and as soon as system detects the alcohol, it stops the engine. And if the alcohol is detected in moving vehicle then system will slow down the engine and will give indication to the vehicles present around. [3]

Along with that we are implementing Accident detection using vibration sensor, Accelerometer, GSM and GPS. If car has met with an Accident then it is detected by vibration sensor and accelerometer after that using GPS we trace the location of place where the accident has occurred and send the SMS on a registered mobile number using GSM module. [2]

Key Words: MQ2, MQ3, GSM (Global System for Mobile) Module, Accelerometer, Vibration sensor, GPS (Global Positioning System) Module.

1. INTRODUCTION

Speed along with drinking and driving cases has become major reason for accident of vehicles in India. If there was an availability of emergency services in remote areas then maybe situation would have been different by quickly getting the accident information. Also informing necessary individual becomes difficult when drivers phone is password locked. Drivers are also consuming alcohol while driving which is another major concern which should have been controlled. Internet of Thing (IOT) is a technology that helps devices to connect various perspectives in one module which helps to evolve alert system in vehicle.

Nowadays due to increase in accidents locating the position has become difficult and also difficult to know the state of driver while driving the vehicle.

Smart car with driver alert system will consists of a leakage sensing component to detect the leakage of car, accident tracker (accelerometer and vibration sensor) which when cross the threshold values to get location of car at time of accident which will be embedded in cars and will be informed to the necessary individual to take appropriate actions, alcohol detection to know whether driver is drunk or not and will take the necessary actions to keep the vehicle safe.

2. LITERATURE SURVEY

2.1. Aastha Singh, Mr. Manish Verma, Mr. Lumesh Shahu (2018), Detection of Liquefied Petroleum gas using sensor through arduino uno microcontroller.

In this paper author has proposed about how to detect the leakage of gas in car using Arduino Uno. Basically with the help of paper, concept of LPG (Liquefied Petroleum Gas) and how detection of gas or leakage of gas could be detected has been understood.

LPG is most commonly used fuel for cooking all over India and even it cost low and is easily available. But not only in cooking, LPG is also used in cars as a fuel. Due to the increase in the use of this fuel safety measures should also be taken into consideration in order to protect surrounding from fire. Leakage of gas in car has become major problem due to which any worst can happen like car accidents or can lead to fire which can be dangerous as LPG is combustible. Since LPG is inodorous gas but due to Ethanethiol which is present in LPG, powerful odour of gas leakage can be observed or noticed easily. To stop

leakage of gas in vehicle, a system is made to detect the presence of gas using IOT (Internet of Thing) which include simple Gas Detector Mechanism. Whenever presence of gas leakage is observed or detected by the Gas Detector Mechanism, an equivalent message is sent to the owner of the vehicle with the help of GSM (Global System for Mobile) Module to take the necessary action before any hazard situation takes place. Gas is detected using sensor named as MQ2 sensor which detects the leakage of gas and is very useful due to its high sensitivity and fast response time and even the values are measured as soon as gas is detected. Various types of gases are detected by MQ2 sensor which includes LPG, Propane, Hydrogen, Methane and other combustible steam. This system is still under many modification process in future based on the safety measures. Gas Detector Mechanism can also be used in residential, hotels, industries, restaurants, warehouse, petroleum industries and in many other places where there is presence of combustible steam.

2.2. ACCIDENT DETECTION AND ALERTING SYSTEM USING GPS & GSM Ajith Kumar.A1, Jaganivasan.V2, Sathish.T3, Mohanram.S*4

In this paper author has proposed about how accident can be detected using IOT components and will inform the nearest hospital or any other medical services which are available. With the help of this paper, proper mechanism about accident detection system has been understood and used in proposed system.

Due to increase in accidents in past few years it is necessary to take some quick actions as soon as possible. This system is used to detect the accident and inform to the nearest hospital and medical services for necessary treatment. Components which are used in this project are Accelerometer and Vibration sensor for accident detection, with the help of GPS module accident location is detected and using GSM module co-ordinates are sent on registered mobile number.

Accelerometer detects the vibrations in X, Y and Z axis and if the threshold level exceeds the given limit then accident is detected and GPS trace the location of the vehicle and message is sent using GSM. This system is very useful in the country like India which has poor facilities for rescuing people who meets with an accident in remote areas.

2.3. Alcohol Detection and Vehicle Controlling Pratiksha Bhuta, Karan Desai, Archita Keni

Drinking and driving can cause accidents in day to day life in real world that is the reason author has proposed the system in which alcohol is detected and how the vehicle is controlled using IOT components. The aim of project was to reduce the road accidents that are happening due to drink and drive cases.

Increase in drink and drive cases has become serious issue due to which author has developed this system which detects alcohol, control vehicle and inform the location of vehicle to the contacts which are registered in system in case in some emergency situation. MQ3 sensor is used to detect the alcohol, when value crosses the threshold value then system gets lock or engine of vehicle stops immediately and on LCD screen it displays "Alcohol is Detected". After the engine is stopped an SMS is send on the 3 registered numbers along with the location using GSM and GPS module. Using this system driving has become safer and also if any emergency situation occurs it would become easy to detect the present location of the vehicle and can able to take the necessary actions.

3. EXISTING PROBLEM

Air pollution due to vehicles has increased day by day, so it was important for the driver to know status of the vehicle while driving. Sometimes it is unable for the driver to know that their vehicle is emitting harmful gases due to which it causes problem for surrounding people. And also due to increased in use of automobiles, cases of accidents and drink and drive cases are also increased simultaneously which has also become serious problem nowadays.

In existing system, mechanism of accident, alcohol and gas combustion detection was not present so due to this reason it was difficult for the driver to know the state of vehicle as well as it was also difficult to know the location of vehicle if meet with an accident.

4. PROPOSED SYSTEM

This multifunctional car has various modules where each component consists of various functionalities. Due to advancement in technology and IOT this project can be use in various.

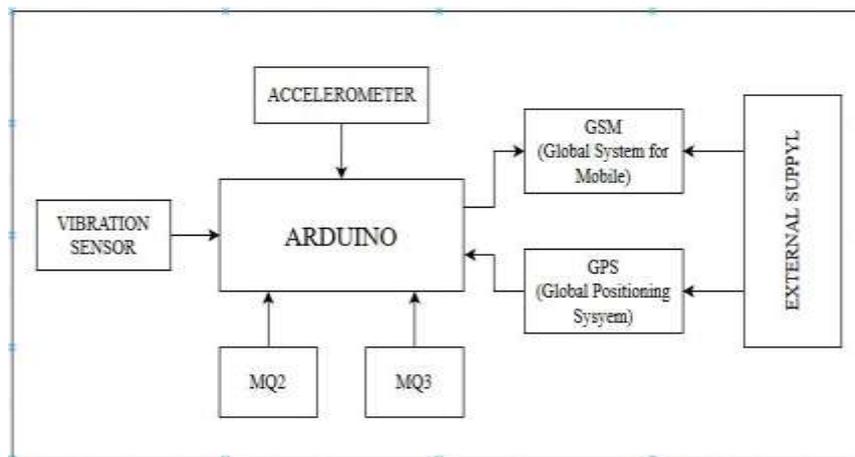


Figure 4.1: Block Diagram for Smart Car with Driver Alert System

Initially, Alcohol sensor, Gas detection sensor and Accelerometer will get started. Alcohol sensor is MQ3 which detects the presence of alcohol from 0.05 mg/L to 10 mg/L. It will detect the alcohol as soon as you start breathing. Threshold value of Alcohol sensor is given in system code and as soon as sensor detects the value and if it is crossing the given threshold value, then vehicles engine will not start. And when the alcohol is detected in moving vehicle, then vehicle will slow down while giving indication to nearby vehicle so that they do not collapse with each other.

If the vehicle engine is started, that means the alcohol is not detected and vehicle will start the engine and along with that, GSM will get activated and Gas detection sensor that is MQ2 sensor will be continuously detecting for gas emission in vehicle. MQ2 sensor will detect the gas anywhere from 200 to 10,000 ppm (Parts – Per – Million) and consist of Anti- Collision Network which is stainless steel mesh to ensure that sensor will not cause explosion because of using the flammable gases for testing. Since MQ2 sensor is continuously checking for the values, if the value of gas crosses the given threshold value, then GSM module will send the message on the registered mobile number, that the vehicle is emitting harmful gas so that driver or the respectful person can take the necessary action to avoid any problems.

Accelerometer and Vibration Sensor will continuously detecting the values for major and minor accidents respectively. Accelerometer is usually operates in three axis which is X, Y and Z axis and Vibration sensor operates based on mechanical principle for detecting observed system vibrations. Accelerometer and Vibrations sensor will take the values simultaneously. If the values of X or Y or Z axis is greater than maximum value or the values of X or Y or Z axis are smaller than minimum value of Accelerometer then it will assume that major accident has happened and if the values of vibration sensor cross the threshold value then it will assume that minor accident has happened. When accident has happened at that time GPS module will get started and will get the Latitude and Longitude, GSM module will send the link of location where accident has happened on registered phone number so to take necessary action.

Flowchart:

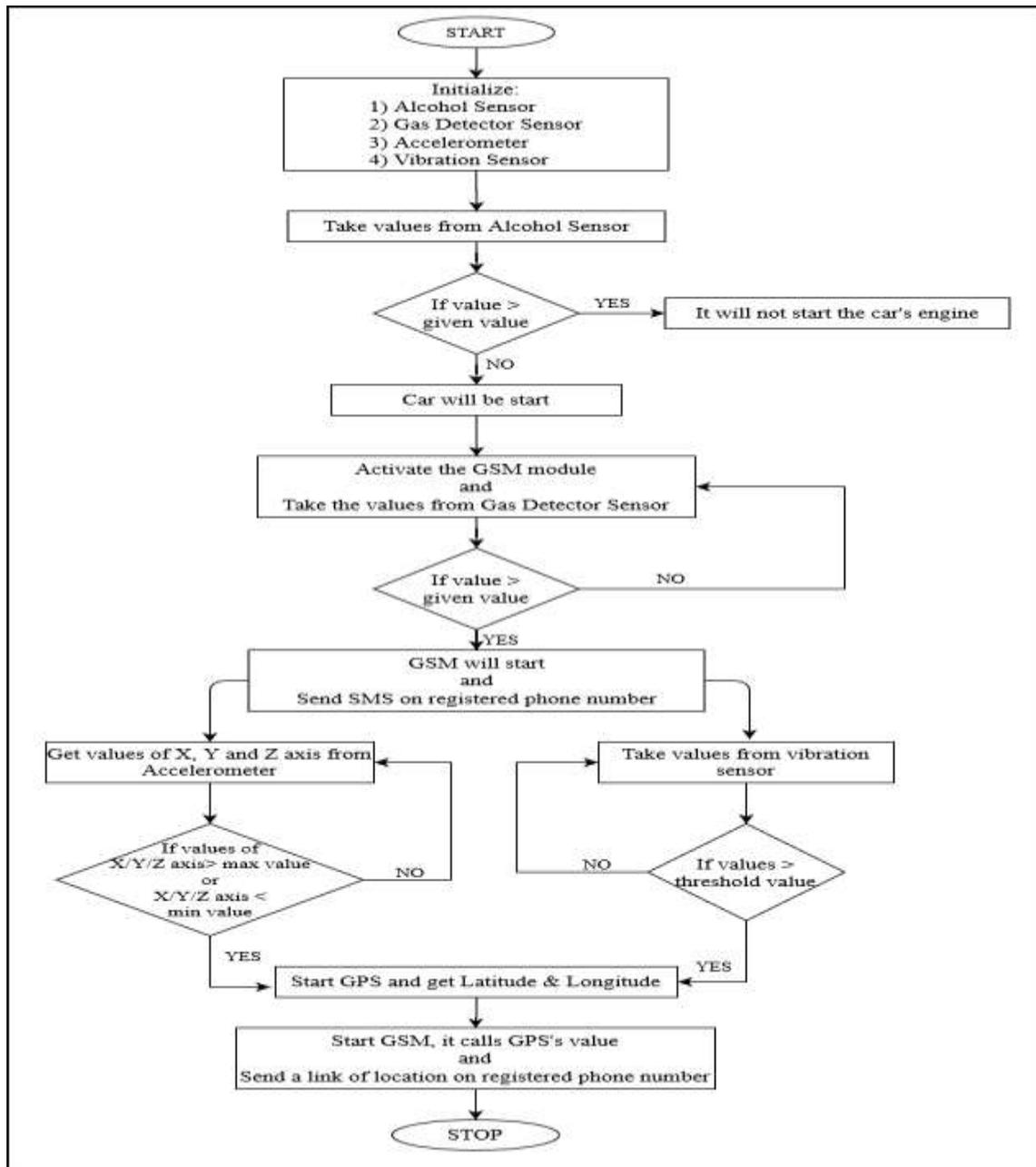


Figure 4.2: Flowchart of Smart Car with Driver Alert System

Step 1: Initialize MQ3 Sensor, Accelerometer, GSM Module, MQ2 Sensor and Vibration Sensor.

Step 2: MQ3 sensor will take value, if the value is greater than given value then vehicle's engine will not start and if alcohol is detected in moving vehicle then vehicle will slow down by giving the indication to nearby vehicle.

Step 3: If vehicle is not started then system will activate the GSM module and take the values from MQ2 sensor. After initializing the sensors it will take the values from MQ2 sensor, if the values are greater than the given value then it will send the message on the registered phone number that gas is leaking in car.

Step 4: If value is not greater than given value then system will start taking values from accelerometer and vibration sensor.

Step 5: After taking values from accelerometer and vibration sensors if the values of X, Y, and Z is greater than given threshold value then it will start the GPS and sends the SMS using GSM Module to the registered phone number with location.

Step 6: If values of X, Y and Z is not greater than the given threshold value then goes to step 4.

Step 7: Stop

5. CONCLUSION

Due to increase in consumption of alcohol has increased, it has simultaneously increased the death rate because of drink and drive cases also gas emission has become problematic. This paper has been proposed to overcome all this problems which has arrived and will help the people to save their own lives. Project has executed successfully by fulfilling all the objectives. Further extension can be made as per the requirements.

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