SMART CAR MONITORING SYSTEM USING ARDUINO

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Abstract - *Security in travel is primary concern for everyone. This Project describes a design of effective information system that can monitor an automotive / vehicle / car condition in traveling. This project is designed to inform about the location of vehicle, accident that is occurred to a vehicle to the family members of the traveling persons and leakage of gases from the vehicle which in turn causes accidents. This project uses accelerometer sensor which can detect the unevenness of vehicle and vibrations when an accident is occurred. This sends a signal to microcontroller. Vehicle accident detection system using GSM and GPS modems is done. Messages notifications are sent to the mobile number which is prescribed. This monitoring system is composed of a GPS receiver, arduino and a GSM Modem. GPS Receiver gets the geo satellite information satellites in the form of latitude and longitude. The arduino processes this information and this processed information is sent to the user/owner using GSM modem . A GSM modem is interfaced to the MCU. Heat sensor used to detect temperature level and leakage of harmful gases in the vehicle.*

Key Words: GPS, GSM, ARDUINO UNO

1. INTRODUCTION

Major deaths occur due to the road accidents in all over the world. According to the recent Surveys from IIHS it is stated that these can be reduced by proper implementation of the IOT systems and based on notification sytems also. It can only reduce the deaths after accidents but we cannot manage the behaviours of the drivers such as alchohol driving and drug addicted persons drive etc. these behaviours cannot be controlled. Automatic detection of crashes is largely applied in various automobile industries such as tesla one of the leading example. The core principle of the project is to reduce the number deaths which caused due to lack of proper treatment at the right time.The system is currently in an unpolished level .i.e the complete end product has to be made only with the help of industries. In order to make these we need to reduce the dimensions of the system and also the cost with which it is implemented. furthermore advancement can also be made using ultrasonic sensors and cameras

2. LITERATURE SURVEY

The paper published on IJDCST at March-April-2017,Issue-V-5, I-3, SW-31 its ISN code is 2320-7884. This project uses accelerometer sensor which can detect the unevenness of vehicle and vibrations when an accident is occurred. This sends a signal to microcontroller. Vehicle accident detection system using GSM and GPS modems is done. Messages notifications are sent to the mobile number which is prescribed. This monitoring system is composed of a GPS receiver, arduino and a GSM Modem. GPS Receiver gets the geo satellite information satellites in the form of latitude and longitude. The arduino processes this information and this processed information is sent to the user/owner using GSM modem . A GSM modem is interfaced to the MCU. Heat sensor used to detect temperature level and leakage of harmful gases in the vehicle.
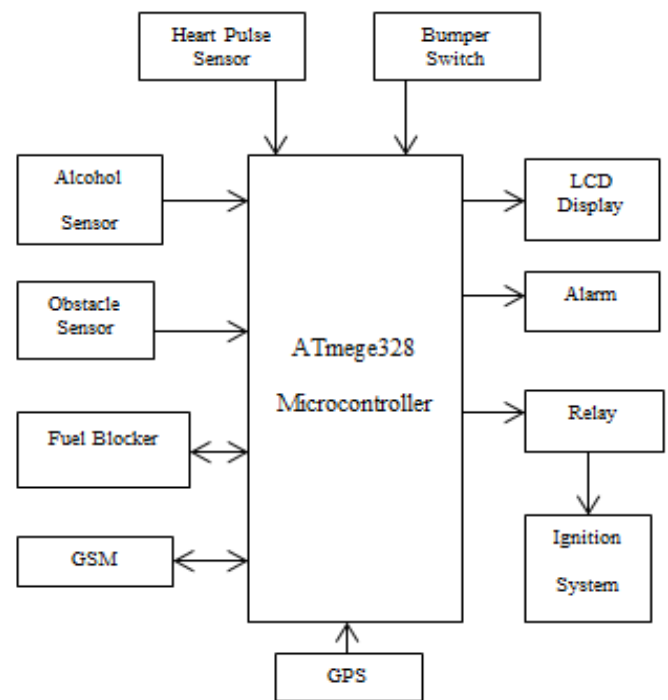
3. PROPOSED SYSTEM

FIG 3.1 Block diagram

In our proposed system our efforts to detect drunk-ness of driver and if they have drunked then prevent them from driving and notifying this detection of alcoholic driver to near police station who are suffering for identifying drunken driver and give punishment. Along with this scheme we are also going to monitor behavior of vehicle in both inside and outside of vehicle. Along provide help to driver when in case accident happened by sending message to ambulance, police station and relative of driver also. Following Figures 1&2 shows block diagram of our system with architecture.
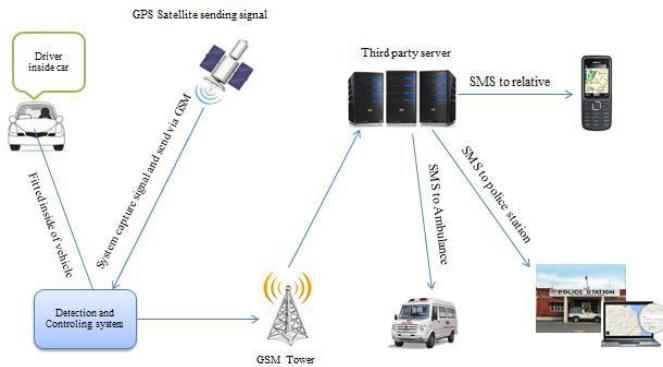
FIG3.2 PROPOSED SYSTEM ARCHITECTURE

In system construction, it mainly consist of two part namely as software part and hardware part. software part include embedded software for interfacing of various hardware component like LCD display ,microcontroller ,sensor ,GSM,GPS etc. whereas in hardware part include component used such as alcohol sensor(MQ-3), GPS, GSM, Obstacle Sensor, LCD display, Fuel Supply Blocker, Ultrasonic Sensor, Heart pulse Sensor, Bumper switch.

In this, upon detection of alcohol two condition are checked. The first is that ,if driver has drunk, he wish to start vehicle at that time at trying to the starting car sensing of alcohol will be done at which speed be 0. If alcohol is detected then signal is passed to microcontroller and car ignition will be stop immediately . so this prevent driver from being drive a vehicle. The second case in which speed is greater than 0 or 2 .It may happen that ,upon drinking alcohol his wish to start vehicle from anybody. So we also provide mechanism to cutt-off fuel supply instead of stop ignition system directly because direct stopping of ignition system on detecting an alcohol may be dangerous as driver driving a vehicle at high speed and it may lead to chances of accident. So after cut-off fuel supply driver will place car at proper position.

4 . Block Diagram Explanation

4.1 Alcohol Sensor:-

The alcohol sensor will detect the alcohol content from human (driver) breath and send it's value to microcontroller. Alcohol sensor (MQ3) is suitable for detecting alcohol concentration just like your common breathalyzer. It has a high sensitivity to small value of BAC and fast response time, provides an analog resistive output based on alcohol.it has sno2 as gas sensitive material to sense alcohol.

4.2 LCD Display:-

The LCD display is fitted inside the car and this LCD display is act as indicator to driver and other people who are sitting inside the car. This display gives indication of alcohol level detected by alcohol sensor, this also provide warning message to driver to stop car or vehicle within particular time afterward car will automatically stop, indication of smoke/gas detected in car.

4.3 Fuel Supply Blocker:-

When alcohol is detected while driving then instead of stop ignition system directly while driving state, signal is passed to fuel blocker and fuel supply is cut-off. This results in fuel supply cut-off to the engine. Thus the engine stops working or doesn't start depending on the position of the car.

4.4 Heart Pulse Sensor:-

In many case, accident due to increasing heartbeat and due to which driver are mostly distracted from driving.so we can also notify other people's sitted inside vehicle about health status of driver. Heart rate sensor consist of device that sense or receive the signal in the form of pulse rate and this determine the heart beat signal in beat per minute. There are two heartbeat condition one normal which is called bradycardia and second is abnormal which is called tachycardia. The normal .human heartbeat is 70 beat per minute and female has about 75 beat per minute. If heart beat sensor detects heart beat rete with abnormal condition satisfied, it means high pulse rate so this signal is passed to controller and related message display on LCD with alarm and warning also send to relative of driver and to ambulance.

4.5 GSM Modem:-

In this we using GSM Modem 300 ,this GSM Modem can accept any GSM network operator SIM card as like a mobile phone with its own unique phone number. Applications like SMS Control, data transfer, remote control and logging can be developed easily. The modem can either be connected to PC serial port directly or to any microcontroller. Heartbeat abnormal condition when detected then this message is send to relative as well as ambulance , alcohol detected is also send to relative and police station with car no and location using GPS system.

4.6 GPS (Global Positioning System):-

GPS is a global positioning system which is used to get the location of particular object in latitude and longitude. we are going to use GPS system to send position information to police and relative of driver when alcohol detected as well as accident happen then location, Vehicle no. is send to police station ,relative and ambulance for providing treatment immediately or as early as possible. And also police can track driver if alcohol detected, to give punishment. The Global Positioning System (GPS) is a satellite-based navigation system consists of a network of 24 satellites located into orbit. GPS works in any weather circumstances at anywhere in the world. Normally no subscription fees or system charges to use GPS. A GPS receiver must be locked on to the signal of at least three satellites to estimate2D position

(latitude and longitude) and track movement. With four or more satellites in sight, the receiver can determine the user's 3D position (latitude, longitude and altitude). Once the vehicle position has been calculated, the GPS unit can determine other information like, speed, distance to destination, time and other. GPS receiver is used for this research work to detect the vehicle location and provide information to responsible person through GSM technology.

4.7 Microcontroller (ATmega328) :-

In this system we are using Arduino board which has advantageous features in which microcontroller ATmega328 are present which is to be using for controlling system .The Arduino Uno is a microcontroller board based on the ATmega328.ATmega has features like speed 20 MHz ,Power supply 1.8-5.5 ,Operational range -400C to 850C ,32KB F lash ,1KB EEPROM ,2KB RAM. Arduino has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything require to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.

4.8 Relay:-

Relay is used to turn off the ignition system by passing low power signal to ignition system .that's mean when alcohol detected power signal is triggered.

4.9 Bumper Switch:-

Bumper switch is kind of switch which is a very effective sensor for collision detection. Bumper switch works as a pushbutton i.e. it is activated when pressed and the microcontroller then performs the necessary action for this condition. This sensor is a very simple way to test collision detection function in any scenario .when some another vehicle collide then this switch is get activated.

5. METHODLOGY

1 .Starting vehicle by driver.

2. Check speed of car.

3. If it is zero then start sensing by various sensor & notify detection .In this case alcohol is mainly checked if it detected then stop ignition .

 4. If speed is greater than 2 kmph then again sensing started. Detection of various   parameter will be sense by sensor & will be notify.

5. At a same time if alcohol is detected then fuel supply will blocked.

6. Vehicle will stopped & notify detection to relative and police station.

7. STOP

6. FLOWCHART
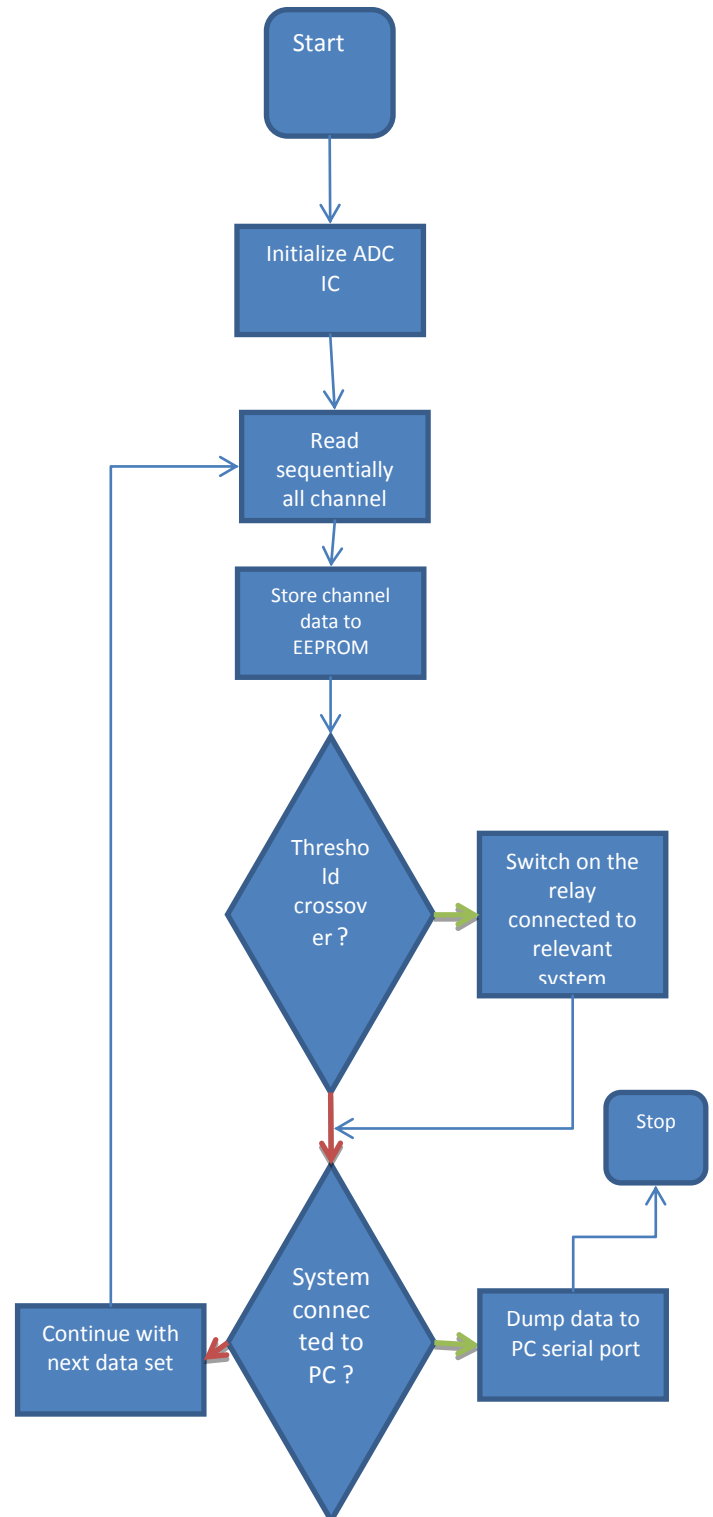
7. CONCLUSION

Proposed system will efficiently detect alcohol through driver breath and stop the vehicle by suspending the ignition, instead of directly stopping the vehicle. Proposed system can notify relatives of driver, police station. Future scope of this system is it can also check whenever the accident happens will notify immediately to the numbers provided in application by the end user and therefore people in the car can get service as early as possible by minimizing the casualties. To implement this approach GSM system can be used, it will also help police to identify drunken drivers and give punishment them by tracking it's vehicle using GPS system

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