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Alcohol Detection and Accident Avoidance Using Locking With Tracking

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Abstract: *Now-day's accident due to alcoholic drink consumed by car drivers has increasing and drivers are often not found by police. So we are introducing system that will detect drunken driver by alcohol sensor through driver breath fitted on steering in front of driver. We will also provide GSM system that will send message to police station and relevant numbers provided in the application of the driver upon detecting alcohol. As well proposed system also focuses on providing GPS base system to track those cars and when alcohol detects at starting of ignition of car then car's ignition will immediately turn-off and if alcohol detected after starting and while driving then application will reduced the fuel supply. We will also use heart pulse sensor to notify normal or abnormal condition of driver and collision of vehicle will detect by bumper switch.*

Keywords: *Alcohol Sensor (MQ-3), GSM Module (SIM300), Microcontroller (ATmega328), GPS System, Fuel Blocker, Heart pulse sensor, Bumper switch.*

I. INTRODUCTION

Every hour, 40 person which under the age of 25 die in road accident. And as per the world health organization, road traffic injuries caused an about 1.24 million deaths worldwide in the year 2010, slightly down from 1.26 million in 2000. that is one person is died for every 25 seconds. only 28 countries, representing 449 million people (7% of the world's population), have adequate laws that address all five risk factors (speed, drink-driving, helmets, seat-belts and child restraints). over a third part of road traffic death are in low- and middle-income countries are among pedestrians and cyclists. however, less than 35% of low- and middle-income countries have policies in place to protect these road users [12].

The main intention of this system is to avoid the rate accidents which are normally happened due drunkenness of driver. this system detect the drunkenness of driver and prevent them from driving, so this try to provide one type of security or safety mechanism to driver and save live. there are also lot of accident reason such as high speed of vehicle, drinking, drowsiness of driver, seat belt adjustment ,and avoid the use helmet that's all lead to accident.

II. LITERATURE SURVEY

Now-a-days, mobile phone is used almostly by all people .with internet usage are also at all.so these mobile phone also provide communication platform as they are equipped with 2G or 3G network .There are lots of cause of acciedent of car and they are drunkenness of driver, drowsiness of driver, unconciuosness of driver, and many time what happen driver is not

responsible for accident but their (car) neighbouring car behavior also have made role to enforce accident. There are also some system have been implemented to avoid accident but that do not give proper solution to implement in car to avoid various accidents that they are normally being happen. For example when driver at speed suppose 80 km/h suddenly stop ignition system may lead to chances of dangerous accident.

In [1] , they had use PIC 16876A controller, Alcohol sensor, LCD Display And Alarm system to notify driver only, ignition system was immediately off when detected alcohol.

In [2] , GSM and GPS was used to send location and alcohol detected related message to relative of driver. Location was normally in longitude and latitude which was difficult to locate. Ignition system directly turn off when detected alcohol.

In [3] , IR LED 894 was used. It was produces high intensity IR ray's ,which mean's it absorb alcohol of only high content from air, so this symbolies that this mechanism will work only when driver is over drunk for lower concentration of alcohol it was detected accurately.

In [4] , IR sensor was used to detect obstacle which comes in front of this sensor(vehicle), and when obstacle detected vehicle was stop. It was also monitoring the toxic gases such as CO₂,LPG, Alcohol from inside area of the vehicle .If there is high content of gases then SMS had been send to authorised person to notify only.

In [5] , It describes a real-time online prototype driver-fatigue monitor. It uses remotely located charge-coupled-device cameras which was equipped with active infrared illuminators to acquire video images of the driver. Various visual cues that typically characterize the level of alertness of a person are extracted in real time and systematically combined to infer the fatigue level of the driver. The visual cues employed characterize eyelid movement, gaze movement, head movement, and facial expression. If the eye of driver is being continuously closing it mean eye-blink frequency is beyond the normal state and it is in sleeping condition then ignition system would be off immediately.

III. PROPOSED SYSTEM

In our proposed system our efforts to detect drunk-ness of driver and if they have drunk 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..

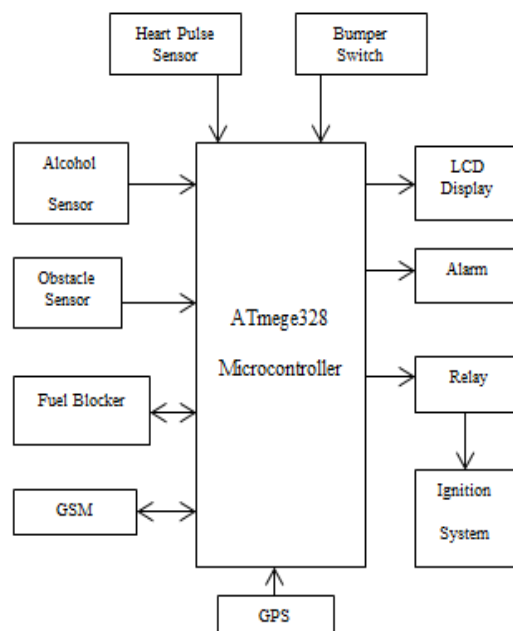


Figure 1: Proposed System Block Diagram

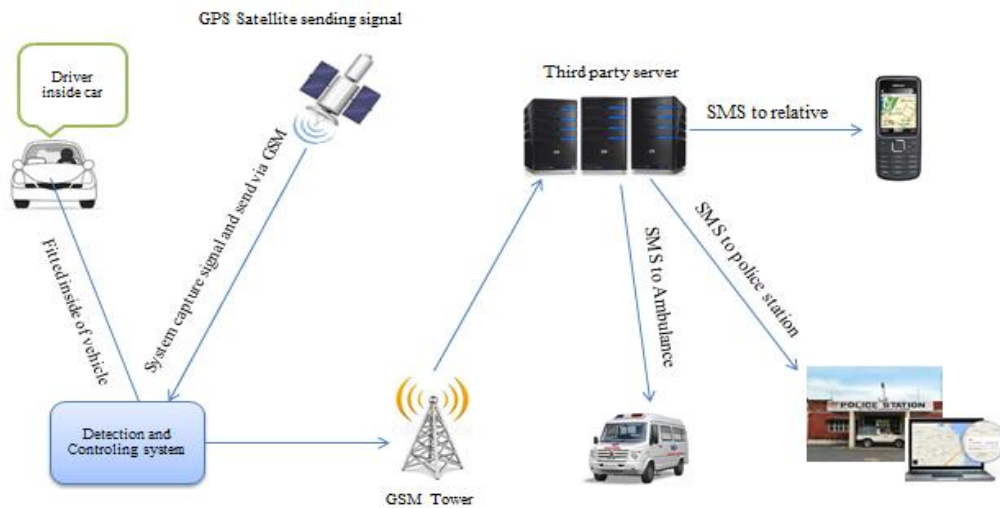


Figure 2: Proposed System Architecture

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 stoping 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.

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.

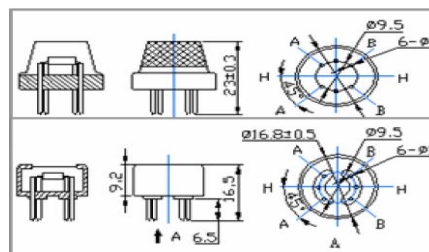


Figure 2: Overview of MQ-3 Sensor.

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.

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. 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 minuit.There are two heartbeat condition one normal which is called bradycardia and second is abnormal which is called tachycardia.The nomal .human heartbeat is 70 beat per minuite 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 warining also send to relative of driver and to ambulance.

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.

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 estimate 2D 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.

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 -40°C to 85°C ,32KB Flash ,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.

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.

7. 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.

IV. FLOW OF PROPOSED SYSTEM

- When driver starting car/vehicle then alcohol sensor start sensing at condition vehicle speed equal to zero.
- If alcoholic driver detected then immediately ignition system will turn off along with SMS about detection is send to relevant of driver for notification and notification will be displayed on LCD with alarm.
- A flag is set when first condition is passed without detection of alcohol.
- When speed of vehicle is greater than zero. i.e vehicle started to driving then again along with alcohol ,obstacle sensor and heart bit sensor start to sense collected parameter values are send to microcontroller.
- If alcohol detected in this case then signal is send to fuel blocker by microcontroller for blocking fuel supply to ignition system.so driver feel's that vehicle is going to stop and then place car at appropriate location .At the same time SMS with current location of vehicle ,vehicle number and detected information send to relative of driver and police station.
- Obstacle sensor sense whether any obstacle in front as well as in back of driver and if any then notify using alarm and display on driver.
- At the same time heart pulse sensor, start sensing in that heart pulse is determine through finger of driver placed on steering and if it is above the normal and below the critical rate then it will be notify to driver by display LCD whereas if it is in abnormal (critical or very high) rate then fuel is block or vehicle will slow speed and SMS will send to relative and ambulance.
- If bumper switch is ON then it is detected as collision that will be notify to police (RTO).
- In other hand, when police station/RTO office received message then they will track car to identify driver.

V. ALGORITHM STRATEGIES TO BE USED FOR PROPOSED SYSTEM

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.

VI. 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.

References

1. M.H. Mohamad , Mohd AminBin Hasanuddin,Mohd Hafizzie Bin Ramli "Vehicle Accident Prevention System Embedded with Alcohol Detector", IJRECE, Volume 1-Issue 4 October
2. "Alcohol Detection and Accident Prevention of Vehicle" ,IJIERE, Volume 2,Issue 3,2015.
3. "Automatic Drunken Drive Prevention System",IJSRTM,Volume2,March-April 2014, ISSN 2321-2543, pg. 74-77
4. "Embedded Controller For vehicle Obstacle Detection and Cabin Alert System" .pdf
5. "Accident Prevention using eye-blinking and head movement" ,ETCSIT2012,IJCA
6. MQ-3 Alcohol Sensor Datasheet.
7. Arduino A000066 datasheet.pdf
8. "Driver Behavior Monitoring through Sensors and Tracking the Accident using Wireless Technology",IJCA (0975 – 8887), Volume 102,page no.2,Sept 2014.
9. Prof.P.H.Kulkarni ,Ms.Ravina Wafgaonkar,Ms.Shruti ,Mr.GauravAbhirao"Alcohol Detection and Automatic Drunken drive Avoidance System".
10. S.P.Bhumkar, V.V.Deotare, R.V.Bobar "Accident Avoidance and Detection on Highway",IJETT,Volume3,Issue2(2012)
11. Dhivya M and Kathiravan S,"Driver Authentication and Accident Avoidance System For vehicle" ,Smart Computing reviews,Vol-5,Feb-15.
12. https://en.wikipedia.org/wiki/List_of_countercou_by_traffic-related_death_rate [Date of access :Sept 10,2015].
13. Amitya kumar tripathy, sejal chopra, Samantha Bosco, Srinidhi Shetty, Firdos Sayyad,"Travolution-An Embedded System in passenger car for road safety",ICTSD-2015,Feb 04-06-2015,Mumbai,India
14. Shan Zhu and Hanghui Zhu,Mi Zhou,"A Design of Vehicle Collision Avoidance System Based On DSP",International Conference of Mechatronics and Automation,IEEE-2009,August-2-12-,Changchun China.