Accident & Alcohol Detection Surveillance Robot

M. Rajani Devi¹, V. Jyothi²

¹,²Department of ECE, Vardhaman College of Engineering, Telangana, India
Mail id: rajimerigala@gmail.com¹, jyothinaikv@gmail.com²

Abstract. Nowadays in India many accidents are occurred due drunk and drive. So, we have made a project to resolve and predict these incidents, in which we used Arduino, Alcohol sensor, GSM and GPS modules. Here the Alcohol sensor is placed inside the car which will detect whether the driver of the car has drunk or not. If the driver is drunk then the Alcohol sensor will get triggered and the car engine will not turn ON or it will OFF the engine if it is already in ON state. Here the other two modules which are GSM and GPS. If the car has met with an accident the limit switch which is present inside the car will trigger the Arduino by which an SMS will be sent to the particular contacts which are been saved in the Arduino program. The GPS will be connected to the number of satellites so that when the car met with the accident the live location of the car will be sent to the contact through the GSM module. This entire setup of GPS and GSM will be kept inside the car. This entire project can reduce the accidents which are occurred by the drunk and drive and dead corners and also predict the location of the accidents. It results in increasing the human safety and protection

Index Terms—Alcohol Detection sensor, Arduino Uno, Arduino Nano, GSM, GPS, Relay, Switch, Motor Driver.

1. Introduction
In this concept the driver will be forced to follow the safety measures like avoiding driving under the influence of alcohol. In this changing world, Arduino has grown dramatically to invent new concepts to make things smarter. The world’s second largest road network has included in India with approximately 3 million km of highways, 60 percent of which are paved. Every year, more than 97k people die due to road accidents in India. Arduino UNO is used as a microcontroller in this project to implement the driver monitoring system [1]. The alcohol level consumption by the driver is monitored using the alcohol sensor. We also use GSM module for communicating in an abnormal case and GPS module for tracking their location.

As the road safety is the major concern, the lanes, direction arrows, and signboards have followed some rules and guides that make the travelling easier for citizens. But, accidents still happen because of uncontrollable factor like drunken people. Driving under the influence of alcohol many people are affected and destroyed their lives if we drink and drive, we have to be very careful on the roads. We should think about the other people who were on the roads. The alcohol detection works on the principle, If a driver drunken, the alcohol level will detect by the alcohol breath analyser sensor. When a level increases above the threshold level, an alert will come and engine of the vehicle stops immediate [2]. This is done in order to ensure the safety of the people. This project will be all the more meaningful for the people to reduce the number of accidents involving drunk drivers in the city. The main purpose of a vehicle tracking system is to ensure the safety of all of a vehicle. The main
objective of this scheme is to reduce the number of accidents. In the latter, such as a GPS, is a highly useful and, at the moment, this system will make it possible for the owner to track and trace the whereabouts of your vehicle, and the vehicle, and the history of the vehicle operation.

This technology, popularly called vehicle tracking system, it has created many wonders in the field of vehicle safety. When a vehicle is stolen, the information on the location of the tracking system can be used to determine the location, and may be reported to the police for further action. [3] This system is also able to detect the vehicle's motion, and then notify the site owner. It's an accident warning system, which detects the accident, the partner of the accident and send the GPS co-ordinates in order to identify a mobile phone, personal computer, etc., to determine the alcohol level of driver when he blows in the air. The level of alcohol that exists in the air is detected by using the sensor. An email will be sent to the Arduino UNO where the alcohol has been set. The Arduino UNO to compare the amount of alcohol that is being received by the sensor of the level of the natural alcohol. If the alcohol level is much higher compared to the normal or usual level, the Arduino executes the code that allows it to be the driver of your car.

2. Literature Review

Driving under the influence of alcohol many people are affected and destroyed their lives if we drink and drive, we have to be very careful on the roads. We should think about our family and the other people who were on the roads. The alcohol detection works on the principle, if a driver drink and drive the alcohol breath analyzer sensor will estimate the level of alcohol in the breath of drunken driver and if the alcohol level has increased above the threshold level, an alert will come and engine of the vehicle stops immediately [4]. This is implemented for the safety of people. This project must be more significant to the people to reduce the accidents by the drunken drivers. The main purpose of the vehicle tracking system is to ensure the safety of all of a vehicle.

This scheme has a major objective of decreasing the number of accidents. In the latter, such as a GPS, is a highly useful and, at the moment, this system will make it possible for the owner to monitor and track the location of your vehicle and to find out the position of the vehicle and the past of the vehicle activity [5]. This technology, popularly called vehicle tracking system, it has created many wonders in the field of vehicle safety. When a vehicle is stolen, the information on the location of the tracking system can be used to determine the location, and may be reported to the police for further action. This system is also able to detect the vehicle movements and then the warning to the user.

3. Proposed System

One of the rules that should be followed is the driver should not drink alcohol while driving. These cases are increased in our country. The sensor of alcohol places on the steering to comply with the law that should identify the level of alcohol taken by the the driver from the breathing of air. The alcohol sensor need to be placed at the seat belt if the accuracy level didn’t match. Any other opportunity to get the smell of alcohol is possible, but we can overcome those problems by using our theory. The alcohol amount will measure continuously using the sensor and the image is sent to a microcontroller for verifying whether the driver consumes the alcohol or not. A warning message will send to the owner or police when the image of microcontroller has detected the poisoned alcohol consumed by the driver.

A. Procedure:

Step 1: The system is initialized.

Step 2: Once the person enters the car alcohol, sensors will check out whether he or she has taken alcohol or not.

Step 3: If the alcohol level is more than some threshold value the car ignition is turned off automatically.

Step 4: If not, the car runs normally.

Step 5: Whenever an accident occurs the switch in the current system gets triggered and GSM and GPS gets turned on.

Step 6: With the help of GPS the location of the car is identified.
Step 7: With the help of GSM this location is sent to the concerned family/friend. Step 8: By this, help can get to that location and lives are saved.

B. Flowchart:

C. System Design

Fig1. Flow Chart

Fig2. Block diagram of system
i. Arduino UNO:
This project consists of an Arduino Uno r3, the version, the Arduino is an open-source platform that allows the user to choose a program. In this work, the GSM and GPS modules are controlled by an Arduino uno r3. The voltage range for the Arduino Uno r3 is a 7 to 12. The Arduino is a hardware and software, management software, open-source projects, enterprises, and specific to the world that have designed and made single-board microcontrollers and a set of architecture of digital computing to the micro. Under the GNU General Public License (GPL) or the GNU Lesser General Public License (LGPL), the products are manufactured [6], which makes it possible for anyone to create and deploy the Arduino software, as well as the board of directors. Thus, the control of the board of directors of the Arduino are used by a variety of micro-processors and microcontrollers.

The board embedded with analog and digital input and output link (I/O) that related to the different expansion board for achieving the connectivity (the screens), and other circuits. The boards are equipped with a serial communication interfaces, including USB (Universal Serial Bus). It has been utilized in a program for downloading into the COMPUTER on some devices.

![Arduino UNO](image1)

Fig3. Arduino UNO

ii. Arduino Nano:
Arduino Nano is the compact version of Arduino Uno and when compared to Arduino Uno and the memory is quite small. Two Arduino nanos are used in this project. One is an intermediate between GSM and GPS module and another is used to monitor the alcohol sensor and status of the engine. For the Arduino nano, the voltage range is 6-12v. The size of UNO is twice as large as Nano and thus consumes more space. Arduino Super is typically used for projects that require a lot of I/O pins and various protocols of communication.

![Arduino NANO](image2)

Fig4. Arduino NANO

iii. Driver Module:
The L298N is a national of the 15 - pin industry " housing and PowerSO20 the housing of the system. It is designed to accept conventional TTL logic, the sand level of the unit of inductive loads, high voltage and high current, binary, full-bridge, motors and engines, such as relays, solenoids, DC motors, and stepper motors, for example. For enabling or disabling the device, two activated inputs are generated independently of the input signals. This project is made up of the L298N driver module with a 5v voltage rating. The four wheels of the vehicle can be programmable with the assistance of the
driver module. This driver module is directly linked to the Arduino Uno, which makes the cars travel in all directions.

iv. Receiver: This project consists of an FS-R6B receiver, which is connected directly to the Arduino Uno [need to write pin numbers]. The specification of this receiver is that the receiver range is 1km, the receiver channel capacity is 8 channels, the receiver antenna length is 26mm.

v. Alcohol Sensor MQ3: This project is equipped with a mq3 alcohol sensor, the Arduino Nano alcohol sensor is dedicated, the Arduino Nano is designed such that if the alcohol readings are high, the car ignition device switches off automatically based on the reading of this alcohol sensor. For alcohol leakage detection, the Grove Alcohol Sensor (MQ3) module is useful (in home and industry). It is suitable for detection.

vi. Transmitter: The transmitter used in this project is CT6b, this Tx is programmed with help of T6 config. software in which each and every moment of the car is controlled by assigning channels. and it also consist of 6
channels with a range of 1km line of sight, the operational frequency is 2.4GHz.

![Fig8. Transmitter](image)

**vii. GSM and GPS:**
GSM stands for Global Communication System and GPS stands for Global Pointing System, GSM is used for mobile communications having voltage range as 5V. GPS is used to find the location of device in latitude and longitude using a network of satellites having strong satellite search capability.

![Fig9. GPS module](image)

**Software:**
T6config is used to configure the channels for the communication between transmitter and receiver to move the car in the required direction. Arduino IDE is an open-source technology which is used to write and dump the code into the Arduino hardware.

![Fig10. GSM module](image)
4. Results

We have carried out many experiments in our college the lab, with the aim to detect an accident, discover Alcohol-Control of the Robot. In this project, we are developing a system that automatically shuts off the engine when the driver's breath is the discovery that a certain amount of alcohol. As a result of an accident, the family members are not aware of the incident. Therefore, we are proposing an idea to solve this problem is through the use of GSM and GPS module in order to send messages to the members of the family when the accident occurs. With the help of this app, Soon, we can see that the car is in motion.
5. **Merits**
Advantages of this project can greatly reduce the amount of drunk and drive scenarios. It helps reduce the number of accidents. It helps to identify the location of the car in case of an emergency/accident.

6. **Conclusion**
This is a proposal, in which the model is a cost-effective, efficient, and very thorough in their work. This type of research is used for reducing the number of incidents owing to the driver's use of alcohol, and in order to save people's lives with unexpected cases. For collecting the parameters of state drive and state, the proposed design has been implemented using different kinds of sensors in order to make any decisions, and to communicate the current location using the components, like wi-fi, GSM and GPS modem.

**References**

[1] Alcohol Detection and Accident Alert system for car, based on the Internet of Things (IoT),
International Journal of Research in Applied Sciences and Engineering Technologies (IJRASET), ISSN: 2321-9653; IC, Price: 45.98; SJ Impact Factor: 6.887, Vol. 6 Issue IV, April 2018.

[2] Fleischer, Paul Benjamin, nelson, astoyao , Robert adjetey, Design and development of GSM/GPS based vehicle tracking and alert system for commercial intercity bus , ©2012 IEEE 4th International Conference on Adaptive Science & Technology (ICAST).

[3] Shreenivas R. Jog ,M.S.Sutaone , V.V.Badawe , Ruggedisation Methodologies for GPS based Vehicle Tracking System , ©2011 IEEE

[4] A. ISuge, H.Takigawa, H.Osuga, H.Soma, K.Morisaki, ACCIDENT VEHICLE AUTOMATIC DETECTION SYSTEM BY IMAGE PROCESSING TECHNOLOGY , ©IEEE 1994 Vehicle Navigation & Information Systems Conference

[5] Paul Baskett, Yi Shang, Michael V. Patterson, Timothy Trull, Towards A System for Body-Area Sensing and Detection of Alcohol Craving and Mood Dysregulation, © 2013 IEEE

[6] Sahabiswas, Suparna, et al. "Drunken driving detection and prevention models using Internet of Things." Information Technology, Electronics and Mobile Communication Conference (IEMCON), 2016 IEEE 7th Annual.IEEE, 2016.

[7] Sakairi, Minoru. "Water-cluster-detecting breath sensor and applications in cars for detecting drunk or drowsy driving." IEEE sensors journal 12.5 (2012): 1078-1083.

[8] Guo, Huiwen, et al. "Image-based seat belt detection." Vehicular Electronics and Safety (ICVES), 2011 IEEE International Conference on.IEEE, 2011.

[9] Tushara, D. B., &Vardhini, P. H. (2016, March). Wireless vehicle alert and collision prevention system design using Atmel microcontroller. In Electrical, Electronics, and Optimization Techniques (ICEEOT), International Conference on (pp. 2784-2787). IEEE.

[10] Anil, B. S., Vilas, K. A., &Jagtap, S. R. (2014, April). Intelligent system for vehicular accident detection and notification. In Communications and Signal Processing (ICCSP), 2014 International Conference on (pp. 1238-1240). IEEE.