ISSN: 2278-4632
Vol-11 Issue-01 2021

ACCIDENT RECOGNITION AND PREVENTION OF AUTOMOBILE

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ABSTRACT

The main purpose behind the implantation of the Accident prevention is to reduce the accidents on roads which causes the loss of lives and expensive goods. Prevention of accidents and recognition System save lives by reducing the time required for emergency responders to arrive. This system will prevent accidents by detecting fog and provide clear view on the screen. It will not gave permission to ignition to ON while it detect the consumption of alcohol. Alerting the driver by buzzer while the blinking of eye detect by the blink sensor, if the driver ignores the alert then ignition will be OFF. If any rain is detected by the rain sensor Wipers will be automatically operated. Limit switch activates during accident and system will be OFF and alert will be sent to the parents through a registered Twilio account.

I.INTRODUCTION

Unfortunately, most counties on the planet have a disturbing record in number of death/handicaps because of huge number of mishaps. Mishaps are happened in view of ignorance of individuals. Analysts [1] seen as that 57% of accidents where due to exclusively driver factors, which incorporate his conduct, dynamic capacity, response speed and sharpness. The examinations [1] show that the mishaps can be kept away from assuming driver was furnished with notice alert few minutes before so, they can took some elected course or be careful to keep away from gridlock or accidents [1]. The vehicular adhoc network was taken on to impersonate the adhoc idea of exceptionally unique organization. In this organization two vehicles can speak with each other.. VANET Communication is arranged into two unique sorts' Vehicle to Vehicle correspondence and Vehicle to Infrastructure Communication. The automobile to vehicle information exchange is a communication between two vehicles (i.e.) one bounce correspondence [4], like vehicle-to-vehicle correspondence. It goes about as a multi bounce correspondence. The vehicle-to-vehicle correspondence is a system intended to move essential security related with vehicles to give notice to drivers concerning mishaps. The primary target of this system is to caution drivers when he closes to front vehicle. The correspondence between the vehicles happens through LI-FI. The distance between two vehicles is estimated utilizing Ultrasonic sensor. The microcontroller controls the whole circuit and is modified to inform the driver with a message when the vehicle comes quite close to locate [3]. There are a few snags that thwart the security while driving. The vehicle, for example, vehicle or transports might stall in widely appealing particularly during the evening these turns into a genuine hindrance basically in parkways where the streets are not lit. The vehicle coming behind may not pass judgment on the fixed vehicle and may cause mishap; the vehicle coming behind may hit barely to the rear of fixed vehicle and may prompt more noteworthy harm. Numerous situations were considered for the plan of the system.

Intelligent Transport System (ITS) are progressed applications that are utilized to offer different creative types of assistance to work with street wellbeing and traffic the board, Vehicular correspondence is a development innovation that can be utilized in ITS. Vehicle-to-Vehicle (V2V) correspondence framework utilizing the arising remote framework gives early admonition signs to decrease street mishaps and clogs. To work on the security of the clients an agreeable driving is proposed it additionally assists with working on the proficiency by empowering vehicles to convey mishap related messages with one another. Agreeable driving can likewise be invaluable in working on the wellbeing of the area. It helps and assist driver with taking appropriate choice and keep away from impact and clog.

In this system we plan for providing the correspondence to the vehicle to automobile by using Li-Fi technology. The proposed utilization of Li-Fi Technology in this paper involves principally of Light Emitting Diode (LED) bulbs as a method for availability by sending information through optical range as an optical remote mode for signal engendering. Truth be told, the use of LED disposes of the need of complicated remote organizations and conventions. A limited scale model of vehicle-to-vehicle correspondence framework utilizing Light constancy is introduced.

1.1 Aim of the project

The main purpose of the proposed system is to avoid accidents. When there is heavy rain and fog this project is very useful for this, we are implementing a project by using raspberry-Pi. When there is a heavy fog with the help of camera, we can visualize the fog and we can observe the vehicle which is coming from the opposite end for that we are using open cv and image processing technique. When the driver felt droves and falls into sleep means immediately the blink sensor will be activated and an alert will be given and if the driver is alcoholic it can be identified by alcohol sensor and the ignition won't be ON, otherwise ignition will be ON. And Limit switch activates during accident and system will be OFF and alert will be sent to the parents through a registered Twilio account

1.2 Significance of the work

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ISSN: 2278-4632
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Sensors implanted in a system can warn the driver by detecting dangers in surroundings and Image processing technology can help make vehicles visible to others in poor visibility. This is a great technology to bring about a change in security features of vehicles. GSM/GPRS which is used to trace the location and obtain the latitude and longitude values these values will be send with the help GSM to give the alert.

II.LITERATUREREVIEW

The area of vehicle to vehicle (V2V) technology is speedily developing and to addressing the transportation needs of residents represents the encouragement of innovation and financial development. Global mobility and advancement of numerous urban communities have altogether expanded the quantity of vehicles on roads [1]. Because of the expansion in the scope of the vehicles, there is a gigantic exercise in futility, and an increment in pollution is happening and from opposite side the level of car crashes has expanded significantly. Not just vehicles, but conjointly people on foot face the security danger from traffic accidents [2-3]. After years of analysis and normalization efforts, associated vehicle innovations are almost ready to take off and financially feasible and utilized by the general public in an extremely enormous choice of conditions, mechanical headways are hurrying on the mechanized innovation time toward this destination [4].

Traffic congestion has become an issue these days, driving huge urban communities to control the innovation to give better, speedier and more effective techniques to get entrance. The fundamental driver of road blockage is the drastic growth of the traffic population. Nonetheless, it tends to be settled through appropriate arranged street organizations and shrewd traffic the board techniques [5]. This new worldview of sharing street and traffic information among vehicles continuously frameworks can adjust a scope of utilizations for driver help, security, traffic effectiveness, metropolitan detecting and infotainment to be fused into current plans of vehicles [6-7]. Basically, intended to support driving wellbeing and empower crash avoidance through the solid opportune scattering of caution messages among vehicles. Associated vehicle advances are relied upon to fulfill the steadily expanding information appetence of clients on wheels involving vehicle-to-everything (V2X) interactions as displayed in Figure 1. Vehicles trade data with different vehicles (V2V), yet additionally can impart information to Roadside unit (V2I), anyway with a few elective hubs inside the vehicle's local like the private specialized gadgets of walkers, cyclist and charging stations [8].

III.PROJECT OVERVIEW

3.1 IMPLEMENTATION OF HARDWARE COMPONENTS:

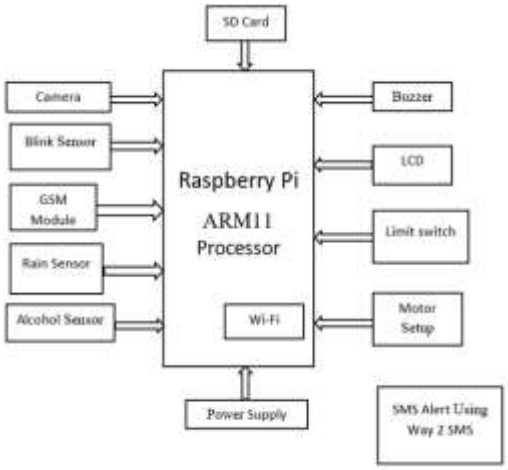

Fig1:Block diagram of Accident recognition and prevention of automobile using raspberry-Pi

The block diagram consists of Raspberry-Pi 3b, Camera, Rain sensor, Buzzer, GPS-GSM, Mobile phone, Limit switch, Blink sensor, Alcohol sensor, LCD.

The main intention of this system is to avoid the road accidents. The circuit has been designed to detect the fog , rain and alert the driver during his/her unconscious condition. The MQ3 gas sensor detects whether the driver is alcoholic or not, if the driver is alcoholic the system will be OFF. In middle of the journey if the driver feels drowsiness the buzzer will alert the driver. If the driver not responded to the buzzer the ignition will be OFF. During raining the ipers automatically ON through DC motor. In winter season we are unable to see or identify the object which is present Infront of a vehicle this can be avoided with the help of open CV image processing technique. Unfortunately, if any accident occurs the information will be delivered through message and immediately it traces and sends the location with the longitude and latitude values to the to the mobile number registered on Twilio account.

3.2 Algorithm:

Step1: Initialize the system.
Step2: Detection of Alcohol if the driver drinks and immediately ignition will be off.
Step3: ignition on/off according to the condition of drowsiness of driver detected by the eye blink sensor.
Step4: Detection and Removal of fog through image processing technique.
Step5: During rain wipers will be activated through motor.
Step6: message alert will send and ignition will off while get an accident.

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ISSN: 2278-4632
Vol-11 Issue-01 2021

Step7: End of the system.

3.3 Flowchart:

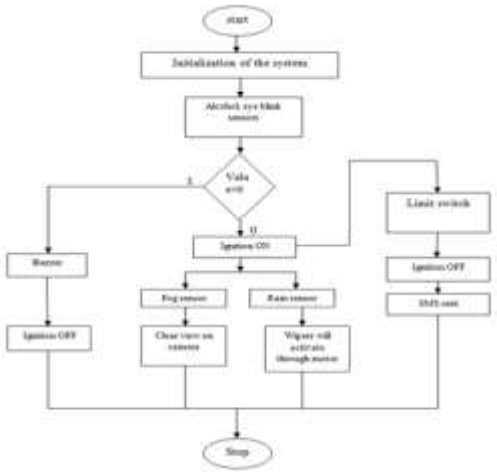

Figure 2 Flow chart of Accident recognition and prevention of automobile

The flow chart represents step by step procedure of the system it consists of decision box, conditional box etc. At first, the system has to initialize that means the user has to enter all the required things to that the system to work at the first stage then connect the system with the same network and switch on the power supply. When the Alcohol and eyeblink sensors are activated then the ignition of the vehicle will be OFF.

When the ignition ON it checks the status of the sensors and next When there is a heavy fog with the help of camera, the comparative visualization of the image is provided on the camera monitor with fog and after the removal of fog using image processing technique. Next when there is a rain occur then the rain sensor will be activated and rain wipers will be activated through motor. During accident the information will be delivered through message and immediately it traces and sends the location with the longitude and latitude values to the parents and authorized contacts. When all the conditions are true the system will perform the operation otherwise it again checks the conditions of the sensors and the status will be updated.

IV.IMPLEMENTATION OF HARDWARE

Architectural Implementation:

In this we are using the major components are Rasbarrypi-3b it is the heart of the system because it activates all the sensors which are connected to the board with the help of software. The main advantage of using this board is itself containing in built WI-FI and by using this we can perform multitasking operations with the help of kernel services we can increase the speed off operation. Pulse oximeter will be helpful here to get all the heart rate and oxygen levels of the patient. A servo motor can be fixed to organize the medical shelves. Temperature sensor will provide the temperature details according to the timing.

Raspberrypi-3b

Raspberry Pi Model 3b is a powerful license-card sized computer with single board, and is a 3rd generation board. So, it is faster then the 1stb generation by maintaining with more powerful processes of and with the popular board format. Bluetooth and lane connectivity makes this as a powerful design.

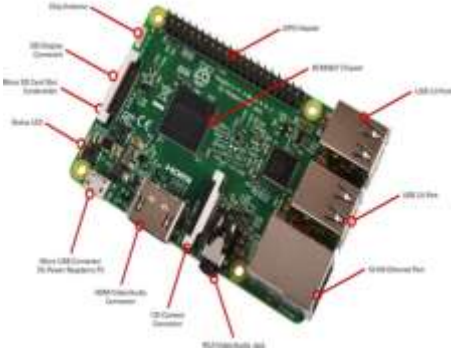

Figure 3: Raspberry-Pi 3b

Camera Module in raspberry-Pi

Camera in raspberry-Pi plug straightforwardly connected to CSI connector in raspberry-Pi. It is ready to convey a perfectly 5MP goal picture, or 1080p HD video recording at 30fps! Most recent Version 1.3! Hand crafted and fabricated includes a 5MP (2592?1944 pixels) Omni vision 5647 sensor in a decent center module.

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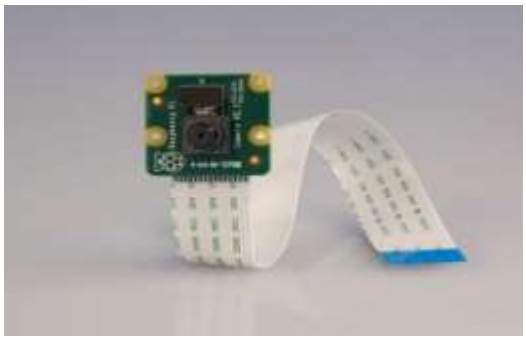

Figure 4: 5MP Raspberry pi camera module

Buzzer Module:

A Buzzer or beeper is an audio signaling tool, which might be mechanical, electromechanical or piezo-electric. Common employments of buzzers and beepers incorporate alarm devices, clocks and affirmation of client info, for example, a mouse click or keystroke.

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ISSN: 2278-4632
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Figure 5: Piezo electric buzzer

LCD 2×16 working

Nowadays, we generally utilize the appliances which are comprised of Liquid crystal displays like personal computers, innovative watches, Compact disk players, DVD players and so out These are usually utilized in the screen businesses to succeed the use of CRTs. The CRTs utilize huge power when compared and Cathode Ray Tubes, Liquid crystal displays heavier just as greater. These gadgets are slenderer too power utilization is very less. The LCD 2×16 instruction for working is, it hinders the light as opposed to disseminating. This article examines an outline of LCD 2×16 , pin design and the working. These are basically depend upon the seven segment LCD display. We know how a seven segment LCD display works, whatever the data that is collected by the sensors in the project are displayed in the Liquid Crystal Display, by interconnecting the LCD display with the sensors. The LCDs are easily programmable and they are conservative. The most popular LCD display is 16x2 LCD display, it is called as 16x2 LCD display because it shows sixteen characters for every line and there are two types such lines.

Figure 6: 16×2 LCD

Rain Sensor Module

Figure 7: RAIN SENSOR

The rain sensor is a simple module for pour finding. It is used as a switch when rain drop fell through the pouring element for analysing force of pouring. The rain sensor consists of a board for pouring and also board for control and is independent of power and resistance

The result of this sensor is recognised for the measuring of rain fall. It is associated with an LED and a 5 volts power supply. The LED will turn ON when there is no rain pouring and yield to be high. When a little amount of water is poured on the sensor then the output will low and then LED may turn OFF or may it have blown like dim.

Eye-Blink Sensor

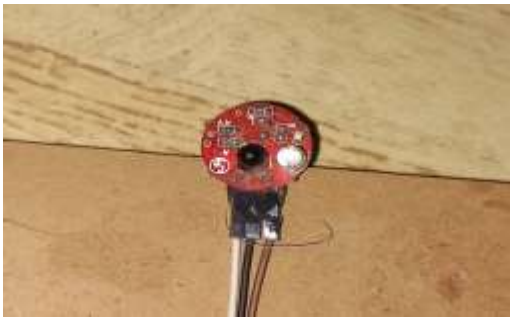

Figure 8: Eye-blink sensor

This sensor is a type regarding the eye and will differ across the eye blink. Assuming that the shut case for eye means the result must be high . This mentioning that the eye is opening or shutting continuously. It includes forestalling accidents due to drowsiness in vehicles. The IR transmitter sends infrared beams into the eyes. the beam reflected from the eye is gotten by the recipient which is in an orderly fashion to the transmitter. Eye blink indication by LED Great Quality

- Simple to Use Instant result advanced sign for straightforwardly associating with a compact sized microcontroller.
- 5 volts DC is the working voltage, Transistor-Transistor Logic yield 5V or 0VOn board 3-pin header and

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ISSN: 2278-4632
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Facility to interface microcontroller gadgets

MQ3 Gas sensor

MQ 3 gas sensor module is effective for detecting alcohol, Hexane, CO, benzine, CH4, and LPG etc. Sno2 is the material used for making a gas sensor. In the cleared air this gas sensor conduct less. When at any point the alcohol gas or any dangerous gas exists then the gas sensor will conduct and its conductivity is become higher according to the concentration level. It is highly sensitive to alcohol and will provide the protection from dangerous gases and also smoke and fume,

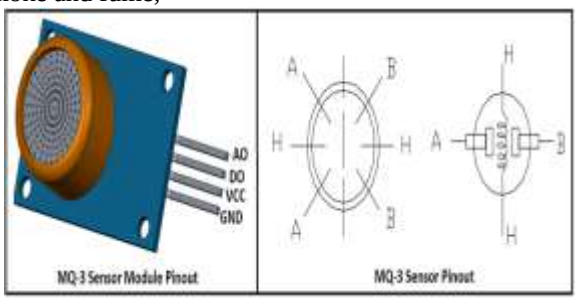


Figure 9: MQ-3 Alcohol Gas Sensor Module Pinout

DC Motor working

An electrical motor is utilized to run on dc power. Two principles are of complete DC plans are Michael Faraday's homopolar engine it is a phenomenal, and the ball bear in engine, a current carrying conductor experiences a mechanical force by it is placed in a magnetic intensity field. Here the flux is created by a winding at field and winding on armature plays a role of current conductor.

Limit Switch

Limit Switches are sensors that let you know when a part is touching it or not. They can be utilized to keep instruments from moving excessively far toward some path, or - whenever set outwardly of the robot - assuming that you've hit something. They do this by conveying a message to the motor regulator or robo RIO announcing it has maximum distance.

Figure10 : Limit switch sensor

Robo RIO

To get a limit change to the Robo RIO, we can utilize typical Pulse Width Modulation link. You can weld the wire straightforwardly as far as limit switch sensor, but some connectors like as these and imprint connectors have permit to make a speedy interface wire. I suggest patching in light of the fact that the little wires are difficult to get a decent crease with, and connectors can become turned off, however I suggest connectors also on the grounds that you can turn off them in case you want to change something.

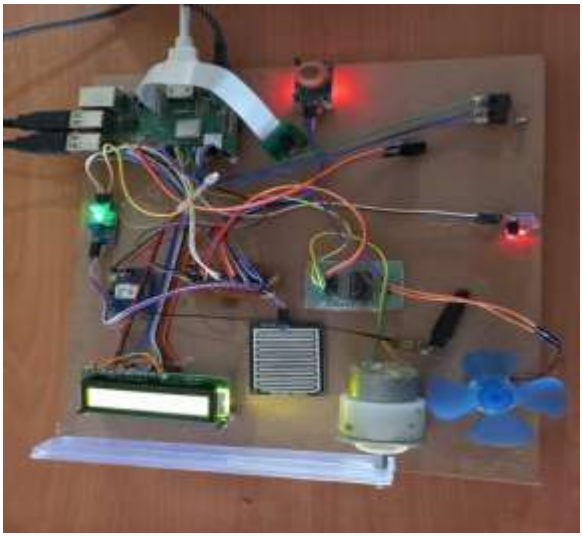
GSM Block

GSM module stands for global system for mobile communication. It is used like a modem. In this project this GSM module place a very crucial role as it helps the patient from as the health condition of patient is monitor or reported to the doctor, if the condition of the patient goes worse. This is done by interfacing the global system for the mobile with the ARM7. This GSM module is called as versatile device. This was invented in early 1970s in the Bell laboratories. It works at 850 to 900 MHz groups.

Figure11 : GSM Module

V.RESULTS AND DISCUSSION

5.1 Results:



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ISSN: 2278-4632
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Figure 12: Hardware set up of Accident recognition and prevention of automobile using raspberry-Pi

The above figure mention that the hardware implementation of the project it consists of different sensors are connected like eye Blink sensor, Limit switch, Alcohol sensor, Buzzer, IR Proximity sensor, DC motor, Rain sensor, LCD, GSM/GPRS etc

Figure 13: Display of all the sensor conditions

The figure shows the detailed information of the circuit, The MQ3 gas sensor detects whether the driver is alcoholic or not, if the driver is alcoholic the system will be OFF.

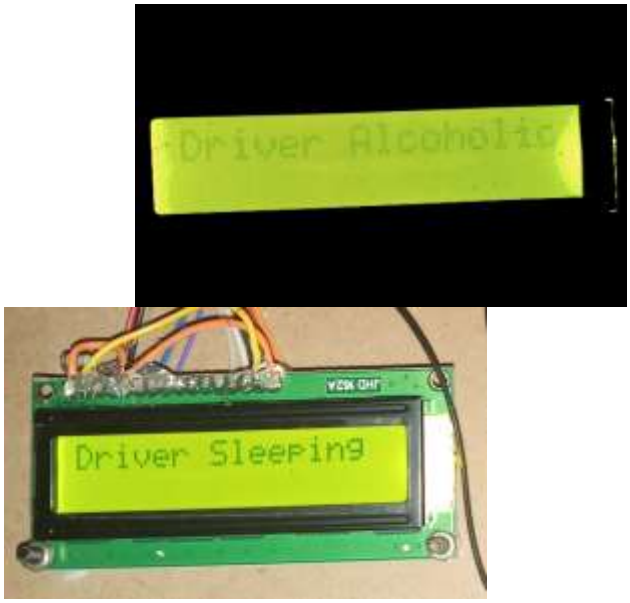

Figure14: Driver Alcoholic Output and Eyeblink Sensor Output

Figure15 : Wipers ON condition

Figure16 : Monitor view of fog detection

VI.CONCLUSION AND FUTURESCOPE

6.1 Conclusion:

- This project presents planning about the basic issues looked by the fog on the roads.
- Clear picturization of the route will be displayed.
- Utilizing the several sensors like Eye blink, Limit sensor, Alcohol sensor and Rain sensor.
- Alerting can be done when accidents occur.

6.2 Future scope:

Security traffic images can distinguished and as per the prerequisite the start can be worked.

- By consolidating this large number of highlights, this can be a finished human security observing system.
- Any place, information checking, remote sending and remote controlling is required, a similar system is relevant straightforwardly with little adjustments, for example, giving vehicle and human existence security without utilizing web, occasionally taken the sensor results and, by sending the cautions to the closest police

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ISSN: 2278-4632
Vol-11 Issue-01 2021

headquarters and clinic that can be extremely simple to settle issue.

- The whole framework can be connected to each vehicle as a straightforward screen. Accordingly; such a system can be carried out utilizing a minimal expense PC like Raspberry Pi which can work like a little PC.
- The most recent headways of innovation and new sheets coming each day, it clear that every inserted application and system will be executed as IOT application.

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