e-ISSN:2582-7219

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 6, Issue 4, April 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.54

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 7.54|

| Volume 6, Issue 4, April 2023 |

| DOI:10.15680/IJMRSET.2023.0604023|

Vehicle Anti Collision System Based on Arduino, Sensors & GSM Module

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ABSTRACT: The majority of cars outfitted with a variety of cutting edge safety features, like automatic systems that assist drivers in maintaining control of their cars and warn them of immediate dangers. The problem however, is that although while this system vastly increase safety, they are extremely expensive and not available for older, lower end vehicles instead they are only included in new, high-end automobiles. This study describe a collision avoidance system that is placed on vehicles and uses ultrasonic sensor, flame sensor for when car is start the burn, MQ3 sensor and GSM Module. We make use of the in car electronic system programme which is designed to decreased the devastation caused by auto accidents. The primary objective of this effort is to develop a model of an accident avoidance system for vehicles that can alert the driver when there is a gap between two moving vehicles and alert from burning using flame sensor, stop accidents using alcohol sensor and GSM Module. This system controlled by Arduino controller (ATmega328p).

KEYWORDS : Arduino Controller (ATmega328p), GSM Module, Ultrasonic sensor, Flame sensor, MQ3 sensor, 12v Battery, Motor Driver.

I.INTRODUCTION

The automotive industry of modern days are far from been defined by expensive cars, flashy cars, sports cars and big muscle cars. Rather, most of the cars seen on the roads today are dominated by features such as safety systems and how well the car can withstand accidents without injuring the driver and passengers within. Automobile manufacturers today can effortlessly assemble extremely safe cars for anybody willing to pay top bill, with some of these safety features now standard making them extremely expensive. As long as cars remain on the road safety is a top priority for automobile manufacturers and will continue to be for a very long time. In this project, we deal with advanced thoughts which include pre-crash sensing an ultrasonic sensor is used to experience the item in front of the vehicle and gives the signal to the Arduino unit. Based totally on the signal received from the ultrasonic sensor, the microcontroller unit is sending a signal to the braking unit for applying the break automatically. Also used Flame sensor, MQ3 sensor and GSM Module for automatic call to the base station. A vehicle or vehicle accident is a street traffic incident which typically involves one avenue vehicle being in collision with, either another car, or every other road user, or a desk bound street side object, and this may result in death, damage and belonging harm.

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II.LITERATURE REVIEW

Prof. NilavaDebabhuti, prof. Prolay Sharma.,[1] They discuss in their paper about A Novel Real time collision avoidance system for on road vehicle using microcontroller. Our proposed system can warn the driver in case the vehicles speed exceeds the lawful limit and also enables the driver to avoid collision with another object or moving vehicle in case the former exceeds the limit of safe distance from the latter.

Prof. MohnadAbdulhamid.,[2] He proposed a system on collision avoidance system using ultrasonic sensors using microcontroller. A distance sensor that detects objects at long distances is needed to apply on a real vehicle.

Mr. Manas Meter, Mr. Harihar Attal.,[3] They discuss in their paper on vehicle collision avoidance safety system using Arduino. It effectively works by stopping the car before the collision can happen. This prototype can save many lives.

III.METHODOLOGY OF PROPOSED SURVEY

The methodology for creating an Arduino based vehicle anti collision system defining the avoiding accidents, selecting the necessary hardware components, such as motors, sensors and batteries, writing the software code using the Arduino UNO, assembling the components in accordance with the design, testing and debugging the system to ensure it satisfies the requirements, improving the design to add requirements, improving the design to add features and documenting the design and code for later use. To produce a practical and effective tool that can carry out particular activities automatically or manually, this requires a mix of hardware and software design and testing.

IV.BLOCK DIAGRAM

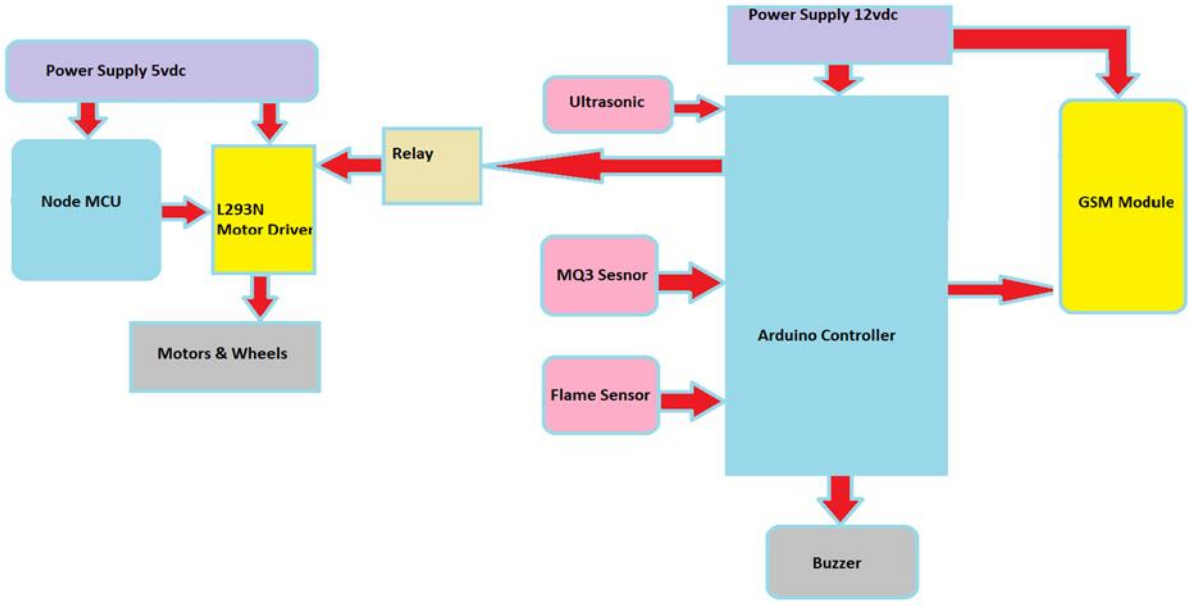

Figure 1. Basic Block Diagram

This project goal is by alerting the drivers or assuming control in an unclear circumstance , collision avoidance systems in cars are intended to stop accidents. The apparatus makes use of GSM and Arduino. In order for Arduino , sensors , GSM Module and other devices to work. One of the more recent safety features , it's becoming increasingly popular in

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contemporary vehicles. The technology can however be installed in more aged automobiles due to its versatility. We go into more detail about how collision avoidance technologies operate in the guide. Signals are sent to the sensor by the collision avoidance sensors , which also monitor the path. The information will be proceed and sent to the system by the sensor. The system then divides its operation into two parts direct control and warning only. Modern devices have sensors built in.

V.CIRCUIT DIAGRAM

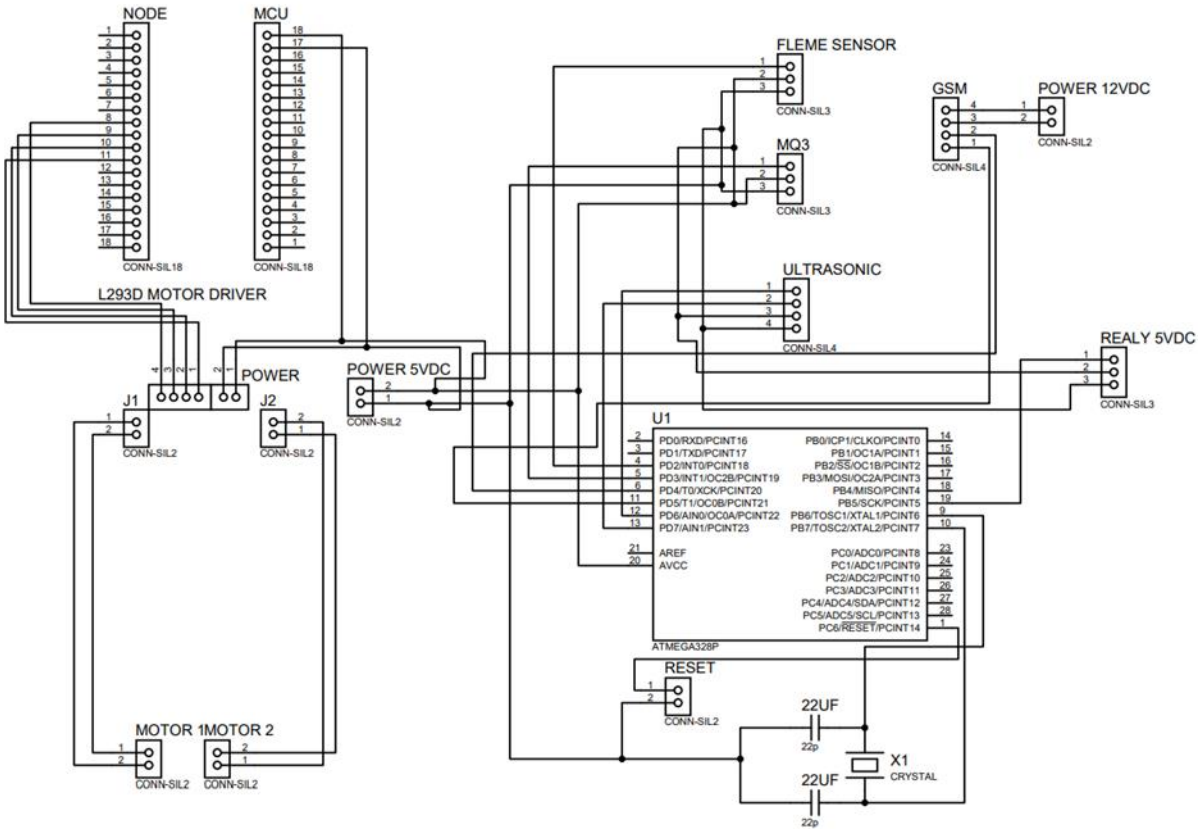

Figure 2. Circuit Diagram

In this circuit diagram we use At mega 328p this IC use as main controller. Crystal for generating clock pulses for controller. Relay use for controlling the system. Ultrasonic sensor is used to detect obstacle. It has 4 pins VCC, GND, Trigger and Echo. MQ3 is connected to Arduino 5 pin. Flame sensor is connected through Arduino 4 pin. Following are the components of circuit diagram.

VI. COMPONENTS

6.1 AT mega 328p: ATmega328p is a high performance yet low power consumption 8-bit AVR microcontroller that's able to achieve the most single clock cycle execution of 131 powerful instructions. The ATmega328p is a popular microcontroller due to it being a major component in the Arduino board products.

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6.2 Relay: Relay are used here to operate aour devices which are having a high voltage devices. There are 1 relay of 5VDC we are using.

6.3 Crystal: The 16 MHz crystal oscillator circuit sustains oscillation by taking a voltage signal from the quartz resonator, amplifying it, and feeding it back to the resonator in our project. It provides clock pulses of 8 MHz frequency. The popularity of the crystals is due to the low cost.

6.4 Blynk Application: Blynk is an IoT platform for iOS or android smartphones that is used to control Arduino, Raspberry Pi and Node MCU via the internet. This application we used to create a graphical interface or human machine interface (HMI) by compiling and providing on the available widgets.

6.5 GSM Module: We used GSM Module is able to receive serial data from radiation monitoring devices such as survey meter or area monitor and transmit the data as text SMS to a host server.

6.6 L293D Motor Driver: The L293D is a 16-pin motor driver IC which can control a ser of two DC motors simultaneously in any direction. The L293D is designed to provide bidirectional drive currents of up to 600 mA (per channel) at voltages from 4.5 V to 36 V (at pin 8).

6.7 Lithium Polymer Battery: We used this battery to operate on the principle of deintercalation and intercalation of lithium ions from positive electrode materials to negative electrode materials.

6.8 Buzzer: We used buzzer as a sounder is also known as audio alarm or audio indicator, a buzzer is a basic audio device that generates a sound from an incoming electricalsignals.

6.9 Sensors: We used there are sensors such as MQ3 Alcohol Sensor, Flame Sensor and Ultrasonic Sensor.

VII. FLOW CHART

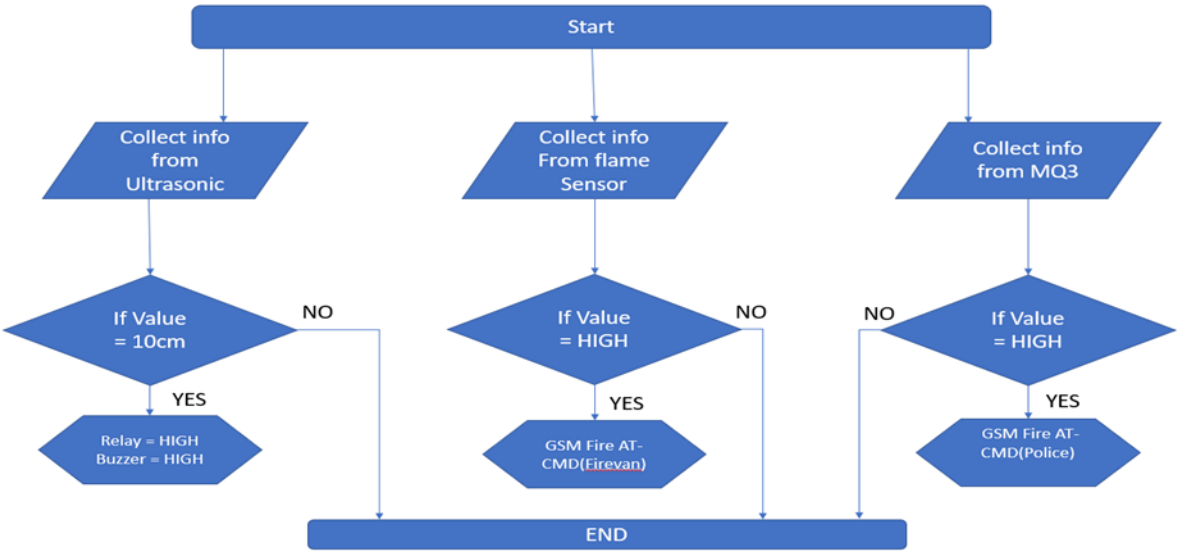

Figure 3. Design Flow Chart

The car's architecture and design are kept as straightforward as possible. Here, the automobile circuit has been built using a few electronic parts and modules. The hardware that is included in the system is listed in section 4 below. According to the flowchart, the smartphone initially detects the GSM module and connects it to the phone. The GSM module then awaits

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serial data. The Arduino reads these serial data and functions as though it were burned to it when the serial data is accessible. The system does not respond when the serial data is unavailable. This system activate before the accident. Screws, bow motors, sensors, battery, buzzer, components, motor driver, Arduino, GSM module, plastic car and rainbow wires were used to construct the car's body.

VIII. RESULT

In this project, the Arduino receives instructions from a smartphone via a GSM Module. The GSM Module receives instructions from the smartphone very accurately and alert within 10 meters. This system is capable of proper movement in any direction. The wireless signal transmission system has performed according to plan. All of the system sensors are operating correctly, as in the system transmission. The quality of the broadcasting signal is excellent. Currently, this anti-collision technology is capable of preventing accidents. Some issues with controlling the bow motor and integrating the GSM system came up when designing this system. By alerting the circuit and the programming code, all of the issues have been resolved. So it currently functions properly.

Figure 4. Project Model

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IX.FUTURE SCOPE

In this system, we've suggested and examined how well an active cars and collision avoidance system performs when the ultrasonic range finder, excitation circuit, and GSM are all operational. In the future, we will develop this system to record the locations of colliding vehicles for assistance applications.

X.CONCLUSION

We have successfully put the wireless car anti-collision system into operation. The android application works well to control the automobile. Even the real-time system feel is a complete success thanks to GSM technology we applied to our avoidance system.

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Impact Factor
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