Safe Driving Using Voice Controller In Android With Embedded System

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Abstract— **As per the data cited in the 2017 report of transport research wing under the ministry of road transport & highways, Government of India has revealed that the country recorded at least 4,80,652 accidents in 2016, leading to 1,50,785 deaths. The pain point is people have no any premonition to avoid accidents in the difficult weather conditions. To overcome this issue presents a new technique in the automobile. Develop a vehicle with an Android application for attaching to the ultrasonic sensor and the LDR sensor. Ultrasonic sensor can detect the obstacles with distance and LDR sensor can control the light brightness for automatically this information transferred to the driver via voice message using Android application and GSM modem. To provide safety for using ultrasonic and LDR sensors which give the feedback at the receiver end. Advanced technologies available in costly cars, but It is low cost and suitable for any vehicle. This is useful for middle-class family persons and the solution is the new one for people.**

Index Terms—**Weather, Accidents, Obstacles, Automatic, Light, Voice Message**

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I. INTRODUCTION

Accidents are   an unexpected (not purposefully caused) event which occurs suddenly and causes injury or loss. . It ruins the lives of many people causing tremendous losing the life of people. Preventing accident refers to activities designed to foresee and avoid accidents. There has been an increase of 17.4% in the total number of death rate caused by road accidents during the period of 2011-2014.This percentage has raised eyebrows and caught the attention of many to curb the growing rate. It is found that 80% of the times it is the fault of the driver. Much prevention system has been so far suggested and some were successful to a few percentages. But unfortunately still the accident rate remains a mysterious and very serious problem yet to be solved. So the technique to prevent accidents by alcohol sensor since most of the accidents occurring today is mainly because of drunk and drive.

In order to avoid rash driving, using a new technique of distance measure from the front side of a vehicle system which uses the ultrasonic waves fitted to the vehicle to detect distance they are apart from which can reduce the speed of the vehicle automatically if the vehicles to present mere closer. Prevention of accidents remains on one side as a huge question mark, but rather on the other side look up for something as a life-saving measure to safeguard our self in case of occurrence of any accidents. Many lives would have been saved if the emergency service could get the crash information in time. Extreme weather conditions can make a difference in your normal driving. That mostly affects your ability to see, which is very limited in adverse weather conditions such as rain, fog, ice, snow, smog and dust. Moreover, in night time some person cannot dim the light, then drivers blinded by high beams that were lead to accidents. There is one death every four minutes due to a road accident in India and One serious road accident in the country occurs every minute and 16 children die on Indian roads for every hour.

II. LITERATURE SURVEY

Driving is a compulsory activity for most people. People use cars to move from one place to another. The number of vehicles is increasing day by day. It is produced tacked tightly and risks to the accident. Nowadays, the numbers of the accidents are so high and uncertain. Accidents occur frequently and cause worst damage, serious injury and death over all Format Specifications. In the existed technology [2] [4] has no any detailed premonition to avoid accidents. At the night time some person cannot dim the light in the vehicle and the bad weather condition the road is not visible. These events can lead to an accident. This problem is continuously happening here, then it has no any solution to stop the accidents that the main pain point for everyone. The people have needed one good solution. They need two type of solution for avoiding accident those are obstacle detection and automatically control the light brightness of the vehicle. In the operation of obstacle detection, people can analysis the distance between the vehicle and obstacles (vehicle, animals, birds and human) and the automatic light density control can lead to an accident during the night time driving. From [1] [7] has no solution for avoiding an accident from different weather conditions and This two solution can overcome the accident from difficult weather condition.

III. SYSTEM REQUIREMENTS

The ultrasonic sensor can emit short or high-frequency sound pulses at the intervals, then propagate within the air at the speed of sound. If the frequency sound touch an object and they're reflected this process is used to compute the gap to the target based on the time-span between emitting the signal and receiving the echo. The distance to an object is calculated by the activity of time to travel between the device and object, then not by the intensity of the sound.
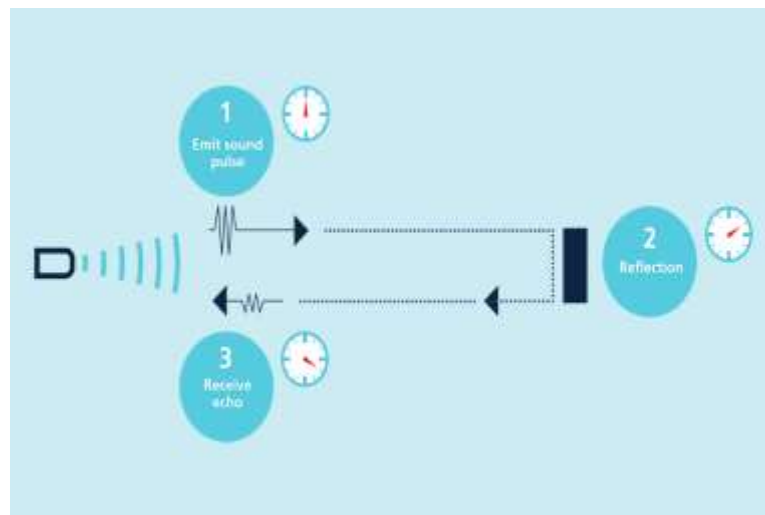
Fig.1 Ultrasonic principle

A Light Dependent Resistor (LDR) is also called a photoresistor or a cadmium sulfide (CdS) cell. It is also called a photoconductor. It is basically a photocell that works on the principle of photoconductivity. The passive component is basically a resistor whose resistance value decreases when the intensity of light decreases. This optoelectronic device is mostly used in the light varying sensor circuit, and light and dark activated switching circuits.

Fig.2 LDR principle

The snake like track is the Cadmium Sulfide (CdS) film, which also passes through the sides. On the top and bottom are metal films which are connected to the terminal leads. It is designed in such a way as to provide the maximum possible contact area with the two metal films. The structure is housed in a clear plastic or resin case, to provide free access to external light. As explained above, the main component for the construction of LDR is cadmium sulfide (CdS), which is used as the photoconductor and contains no or very few electrons when not illuminated. In the absence of light, it is designed to have a high resistance in the range of mega ohms. As soon as the light falls on the sensor, the electrons are liberated and the conductivity of the material increases. When the light intensity exceeds a certain frequency, the photons absorbed by the semiconductor give band electrons the energy required to jump into the conduction band. This causes the free electrons or holes to conduct electricity and thus dropping the resistance dramatically ($<$ 1 Kiloohm).A light-emitting diode is a two-lead semiconductor light source and the p–n junction diode that emits light when activated. When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence, and the colour of the light (corresponding to the energy of the photon) is determined by the energy band gap of the semiconductor.

The GSM module/modem is used for sending the message from sender to receiver. It has SIM port and this is allowing multiple types of SIM for communication. The buzzer produces sound before initialization and the led lights (red, green) indicate the connection between Arduino and power supply. It can be connected to a computer through serial, USB or Bluetooth connection. GSM modem duly interfaced to the MC through the level shifter IC Max232. The SIM card mounted GSM modem upon receiving the digit command by SMS from any cell phone, send that data to the MC through serial communication. While the program is executed, the GSM modem receives command 'STOP' to develop an output at the MC, the contact point of which are used to disable the ignition switch. So the command so sent by the user is based on an intimation received

Fig.3 GSM 800A module

The Arduino could be an open-source microcontroller and it will be programmed, erased and reprogrammed at any time. The Arduino platform was designed to produce an affordable and simple manner of produce devices that move with their hardware surroundings using sensors and actuators. Supported simple microcontroller boards, it's an open supply computing platform that's used for constructing and programming electronic devices It's conjointly capable of receiving and causation info over the web with the assistance of assorted Arduino shields and these microcontroller is programmed simply using the C or C++ language within the Arduino IDE.

Fig.4 Arduino UNO

IV.PROPOSED SYSTEM

In the planned system are going to be performing two operations that are obstacle detection and management the light density for automatically. It includes Arduino UNO, LDR, ultrasonic sensor, LED, GSM Module and connecting wires. These are interacted with the Android application and whole hardware system is controlled with Arduino UNO. The ultrasonic sensor emits an ultrasound at 40,000Hz, that travels through in the air and if there's an object or obstacle in its path it'll reflect in the module. Considering the time period and also the speed of the sound will calculate the gap. In order to get the ultrasound need to set the Trig on a High State for 10 µs. Which will transmit an 8 cycle sonic burst which can travel at the speed, sound and it'll be received within the Echo pin. The Echo pin can output the time in microseconds the undulation travelled. This operation is helpful for detecting the object or obstacles with distance. This data will be transmitted to the Arduino UNO.
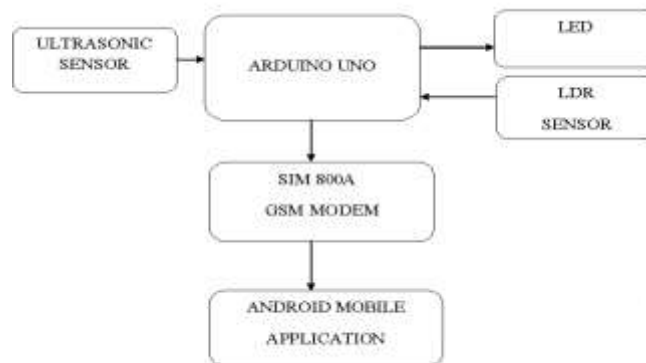

Fig.5 Block diagram

The LDR is used for sensing the intensity of light and gives out an analog voltage when connected to VCC (5V), which vary in magnitude in direct proportion to the input light intensity of it. Since the LDR gives out an analog voltage, it is connected to the

analog input pin on the Arduino. The Arduino, with its built-in ADC (analog-to-digital converter), then converts the analog voltage (from 0-5V) into a digital value in the range of (0-1023). When there is sufficient light in its environment or on its surface, the converted digital values read from the LDR through the Arduino will be in the range of 800-1023 then the program of the Arduino to turn on a relay. Correspondingly, turn on an appliance (LED light), when the light intensity is low (this can be done by covering the surface of the LDR with any object), that is, when the digital values read are in a higher range than usual. Set a threshold light value at 250. You will need to find out the particular value at which the LED light should turn on. This needs to be done after testing it empirically. The Arduino turns on the LED light (via the relay) whenever the light intensity falls below 250. When it is above 250, it turns the light off.
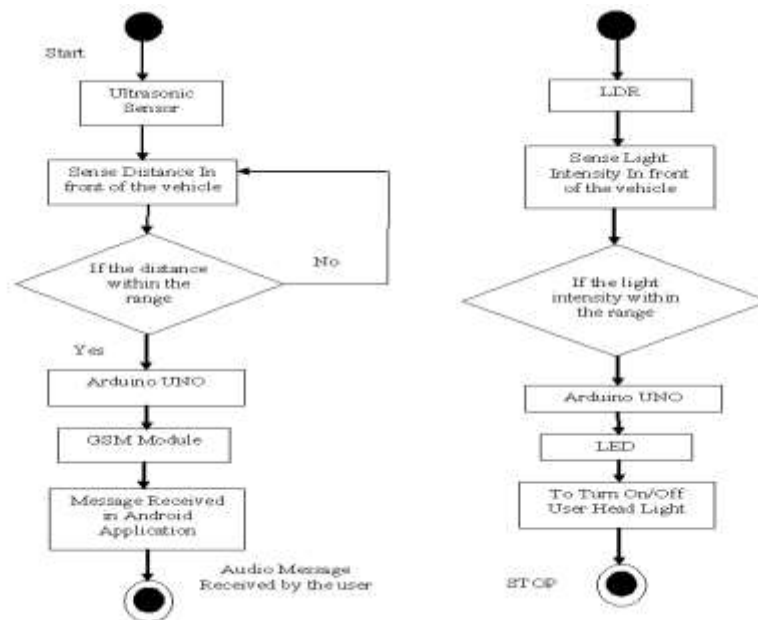

Fig.6 Flow Diagram for obstacle detection and automatic light control.

GSM module requires 12 volts and the GSM stands for Global System for Mobile communications.This is a global standard, which is followed by the GSM modules inside the cellular phones which enables them to be connected to any mobile network around the globe. In this application, the microcontroller based systems have to be connected to the GSM network, which will enable a user to control the system by sending messages to the Android mobile for alert or inform about the status of the system running. The advantage of using a GSM communication with a system or device is that the user can control the system wirelessly no matter how far it is kept compared to any other wireless communication, provided that both the user and the device should be in a cellular coverage area. The GSM module is interfaced using the serial port of the Arduino board. The text message is transferred to the receiver and the message will be converted into the voice message using the android application. These functions can be coded using Arduino C and eclipse software.

V. RESULT AND EXECUTION

The project is aimed at providing a simple and efficient way for providing the solution to avoid accidents in difficult weather condition being faced in today's world. For the project, the first thing is that we have to make all the input and outputs ready and available for sensing and processing of data. The figure shows that the total hardware connections. In the obstacle detection process, the distance is not accurate due to heavy rainfall and winter(ice cube) season for the reason is the ultrasonic sensor can take as consider that raindrop and an ice cube are objects. The android application initialization and voice message outputs are shown in the following figure
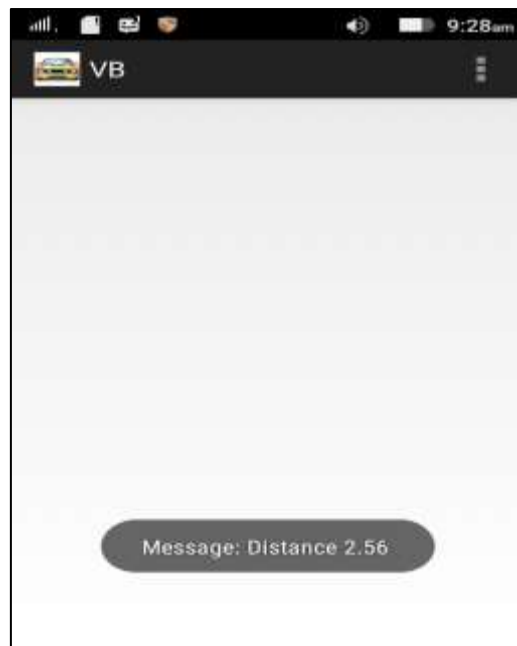

Fig.7 Hardware Connection

Fig.8 voice message with distance

VI. CONCLUSION

The framework of the proposed system is developed for a avoid road accident using ultrasonic sensor and to design a vehicle with less human attention to the driving. Although accidents in the city do not normally have very grave consequences, their high number justifies the use of new systems like the one proposed. The proposed framework efficiently performed in the action of automatic diversion with the help of LDR sensor. Implementation of this system in all vehicles will reduce the chances of happening of accidents and improves the safety levels for vehicles. The results displayed are that of a combined approach which outperforms than a feature-based approach in a disturbed environment. In future, the google map with vehicle detection and tracking system will include this project.

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