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Vehicle Guide To Prevent Accident

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Abstract

World is updating itself digitally and automatic in the means of technology. Accident occurs daily, as per the information from internet and newspaper accident is caused due to two main reasons first is due to loss of concentration of drivers and second is due to crossing the limits in the terms of speed and distance of the vehicle. In order to prevent the accident this idea or prototype will act as a solution. Our idea will calculate the two parameters of the vehicle. The first parameter is the speed of the vehicle and the second parameter is the distance between the adjacent vehicles based on these two parameters we created a simple if-else algorithm to give the alert to the person. Another parameter drowsiness is calculated with the help of sensor in order to indicate the driver whether he/she feels sleepy in order to prevent the accident..

Keywords: Speakers,Vibrator,Automation,Vehicle,PIC-Controller

1. Introduction

Accidents happen on a regular basis in our modern lives. According to a recent survey, states and union territories recorded a total of 4,67,044 traffic deaths in calendar year 2018, taking 1,51,417 lives and injuring 4,69,418 people. According to the research, over-speeding accounted for 64.4 % of the fatalities. The incidence of road injuries, as determined by the amount of people injured per 100 accidents, increased by 0.6 percentage points in 2018. India ranks first among the 199 countries listed in the world road statistics, 2018, in terms of road injury deaths, followed by China and the United States. According to the Survey on Road Safety 2018, India accounted for almost 10 percent of all accident-related deaths worldwide. In 2019 the accidents rates are increased as compared to the last year. In order to reduce the accidents, we came up with an idea of "Vehicle alert system". We have developed a product called "Vehicle alert system" that gives the alert to the people while riding the vehicle by this way we can reduce the rate of accident. The product is the hardware that will be fixed default in all the vehicles which will be coupled with speedometer in all the vehicle. Here, the alert will be given in the form of vibration and voice output which will be produced by the vibrator motor. The vibrator is the best way because alert will not be sensed if the person is wearing helmet or listening to any music or speaking via mobile.

2.Literature Review

Shivani Sharma et al., used the IOT technology to send the alert to ambulance vehicle by calculating the values from the three sensors like Accelerometer, heart-rate sensor and Vibration sensor. [1]

Stephen Eduku et al. developed system, with wireless technology and eye blink sensor is used to prevent accident from the study we decided not to use wireless technology because this may cause a delay in receiving signals due to the interference. We decided to do it as a stand-alone model [2].

G.Muthu Brindha et al., Here prevention is done by making automation in brakes and Multisensors which increases the cost in order to reduce the cost we avoided the automation in brakes and multiple sensors. The reduction in the cost will help the people to buy [3].

Ira Nath et al., proposed an application developed for road users which uses the touch technology to give the alert to the friends, relatives or parents in the form of message after the accident [4].

G. Suriya Praba Devi et al. developed an application which uses the GPS to locate the location and send the alert in the form of notification after the accident. [5].

3.Existing System

The technique that is already existing is the one which gives alert after the accident and also there are some other techniques present which may control entire vehicle for an example car but cost of the system may increase. The disadvantages of the existing system are cost is high and it will suit only for the four wheelers.

4.Proposed System

So to overcome the disadvantages we have proposed a technique which will suits for any vehicle at the lowest cost. This is done by restricting the usage of additional automation controls like controlling breaks, speed and like that we are using a simple alert system which calculates the speed of the vehicle and distance between the adjacent vehicle then it gives alert based on some algorithm designed.
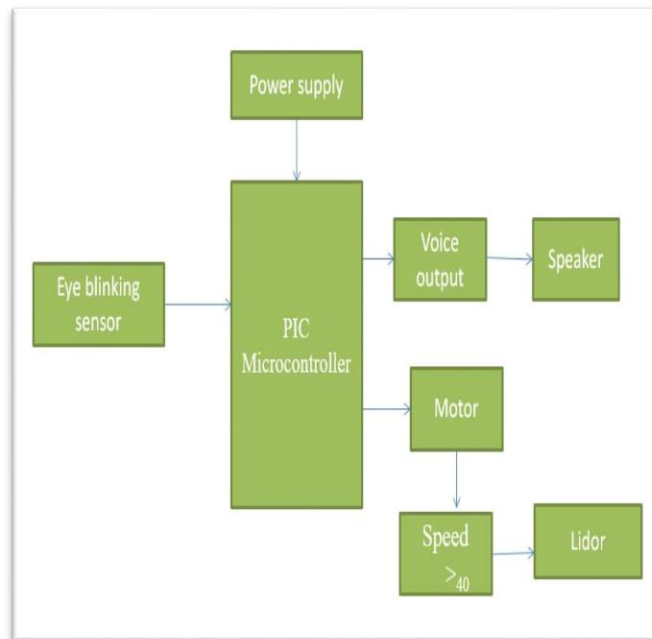
5.Block Diagram

Fig.1 Block diagram of proposed system

PIC Microcontroller consist of 40 pins , 33 I/O pins , .8 ADC channels 2 10 bit comparators . It is a 8 bit microcontroller. The family used here is PIC 16F87A/877A . This is the heart of our project which gets input through 33 I/O pins and gives output to 33 I/O pins. Inputs are LIDAR , Eye blink sensor, Motor . Outputs are speaker ,

6.Methodology

6.1.Pic Microcontroller

This is the heart of our project which gets input from many sensors, process those values and alert will be given according to the algorithm designed. The input to the microcontroller is LIDAR, Motor, Eye Blink Sensor. The output of our project is speakers, Vibrator.

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Fig.2 PIC Microcontroller

6.2.LIDAR: (Light Detection and Ranging)

The earth's surface was measured using remote sensing technology. To quantify the entity, it employs light in the form of a pulsed wave. It works same like the ultrasonic sensor but the sensing range varies. We are using LIDAR instead of Ultrasonic sensor because using LIDAR the measure distance between the adjacent will be stable and more accurate than the ultrasonic sensor and also range of detection is high.

The distance between the adjacent vehicle is measured using LIDAR only when the speed is greater than 40 km/hr or else it will not measure. By this way we can make the module to work only in certain condition in order to avoid the accident.

Fig.3 LIDAR

6.3.Eye Blink Sensor:

The driver's drowsiness is monitored using the eye blink sensor. This works by transmitting and receiving the infrared light . The light is transmitted to the eye and received from the eye by measuring those values we can sense if the driver is experiencing some drowsiness. If the driver is sleepy, then an alert will be given in the form of voice and vibration.
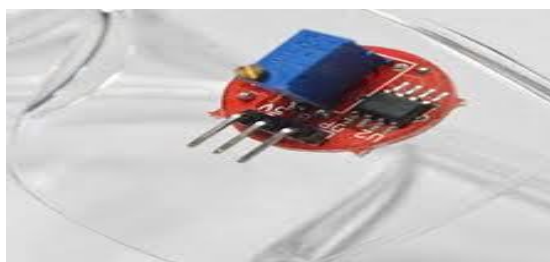

Fig. 4 Eye Blink Sensor

6.4.Speakers:

The speaker is the output of our project . This only gives the alert in the form of voice to the driver when

Fig .5 Speaker

ever he/she fails to attain the criteria of the speed and distance of the vehicle

6.5.Vibrator

This vibrator will be activated whenever driver feels drowsy. The vibration will be given with less frequency to the handle bar of the vehicle. Here the alert is in the form of vibration.

6.6.Motor:

The motor is the engine of the vehicle here. The RPM of the motor is calculated and feed it to the microcontroller. If the speed of the motor is greater than 40 km/hr here rpm is assumed in the form of km/hr then the measuring of the distance will be started.

7.Hardware Description

7.1.Pic Controller

A microcontroller is a single-chip device that combines a basic CPU with support functions such as a crystal oscillator, timers, and so on. Automobile motor management systems, remote controls, office computers, equipment, power tools, and toys all use micro controllers.

A microcontroller is a single-chip device with a processor core, memory, and programmable input/output peripherals that is primarily used in embedded applications.

7.2.Yelink Sensor

An infrared transmitter and a receiver make up the eye blink sensor. The rays are transmitted by the infrared transmitter and received by the receiver. For 3 seconds, the sensors detect our eye reaction (closed or open) and send data to the device, which is the timer circuit. The input is then sent to the board through the timer circuit.

Specification:

Detection Range: 2cm to 30cm

Detection angle: 35°

Operating Voltage range: 3.3V to 5V

3mm Diameter hole for easy mounting

7.3.Motor

An electric motor is a device that transforms electrical energy into mechanical energy. The operating theory of a DC motor is as follows: "whenever a current carrying conductor is placed in a magnetic field, it experiences a mechanical force". Fleming's left hand rule determines the course of this power, while the magnitude is determined by

F = BIL

Where, I = current; B = magnetic flux density;

 L = length of the conductor within the magnetic field.

8.Software Description

A.   MP LAB

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Microchip's PIC and DSPIC micro controllers are included in the Integrated Development Environment (IDE), which is an open, integrated tool set for developing EMBEDDED applications. MPLAB IDE is a 32-bit Windows program that is simple to use and provides a variety of free software modules for rapid application creation and debugging. MPLAB IDE also acts as a centralized graphical user interface for third-party and Microchip software and hardware creation tools. Since MPLAB IDE provides the same user experience for all platforms, switching between them is is a snap, and updating from the free software emulator to hardware debug and programming tools is done in a flash.

Microchip's PIC and DSPIC micro controllers are supported by the Integrated Development Environment (IDE), which is a free, integrated tool set for developing EMBEDDED applications. MPLAB IDE is a 32-bit program that runs on Microsoft Windows, is simple to use, and comes with a number of free software components for quick application creation and debugging. Additional Microchip and third-party device and hardware creation resources can be accessed via MPLAB IDE's unified interactive user interface. Since MPLAB IDE provides the same user experience for all gadgets, switching between them is a breeze

8.1.Embedded C

Assemblers were used to create programs for microprocessor-based applications, which were then fused into EPROMs. There used to be no way to figure out what the program was up to. To ensure that the software was executed correctly, LEDs, switches, and other devices were used. They were, though, prohibitively expensive and unreliable. Embedded C Programming language is used for programming the microcontroller.

8.2.Algorithm
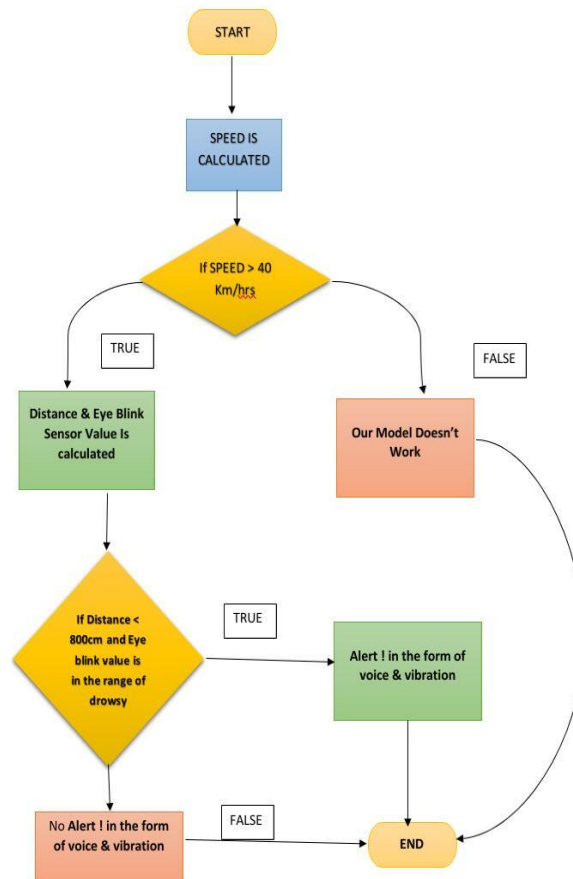
1. The module designed starts calculating the speed of the vehicle i.e in this project, speed of the DC motor is calculated.

2.The the condition is checked. Here, if the speed of the DC motor is greater than 49Km/hr, then the module starts calculating the distance between the adjacent vehicle and drowsiness of the driver.

3.If the calculated values not meet the condition, then the alert will be given to the driver in the form of voice, Else the module will nor produce any alert.

4. By this way we can able to produce the alert to the drivers.

5. Here the threshold value of the speed is not fixed, it varies according to the users need.

6. For an example, if the user keeps the threshold as 50km, then the module works accordingly.

8.3.Output

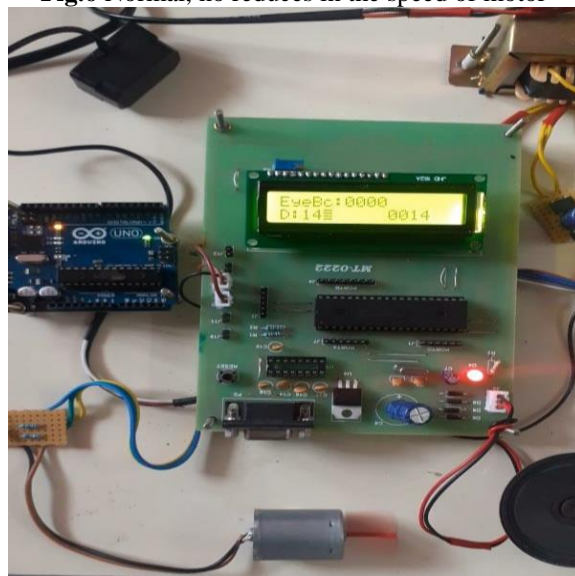**Fig.6** Normal, no reduces in the speed of motor

Fig. 7 Speed of the motor is reduce when the distance is less than the threshold value and alert in the form of voice will also be given
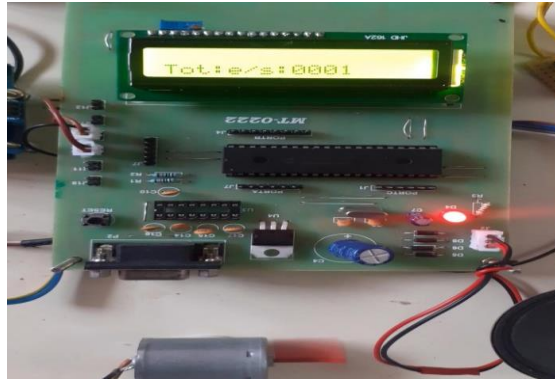
Fig .8 No drowsiness alert because e/s < 5 ;If it is greater than 5 then alert will be given

Fig. 9 If e/s greater than 5 e/s than the drowsiness detection will be given in the form of voice.

9.Conclusion

Thus by introducing this method we can able to prevent the accident and also the cost of manufacturing will be reduced. It also helps the drivers who travel long distance without sleep.

Project is going to be implemented in an accurate way by introducing the Aritifical Intelligence in the future which would be more effective. And also deep learning will be used to reduce the delay of giving the alert. Now we implemented the project in less amount and also we didn't used any internet for communication between the vehicle which weould make the delay to increase we just implemented it using the sensors and hardware into order to reduce the cost. Because our primary moto is to reduce the accidents. If the cost of the hardware increases, then people won't buy it due to this there may be a great increase in the accident

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