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Accident Control System Using Ultrasonic Sensor

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Abstract: The main objective of the develop system is to avoid accident by giving indication through lamp or buzzer. Accidents can occur anywhere, anytime therefore it is necessary to develop a system to avoid accidents. Now-a-days accidents are happening more frequently due to globalization, lack of attention, drowsiness, fast speed of vehicles. On the curved road vehicles of one side cannot predict that vehicles are coming from other side due to this accidents can happen. To overcome this problem the system has been developed in a simple manner using microcontroller, ultrasonic sensors. This proposed system gives indication of vehicles coming from opposite side by using two lamps on both sides of road. This system plays an important role in avoiding the road accidents.

Keywords: Accident, Ultrasonic sensor (HC-SR04), Controller (ATMega328), Arduino.

I. INTRODUCTION

Due to advanced technology and increase in population the use of vehicles is increasing rapidly. Now-a-days it is important to secure the lives and accident prevention is very difficult. There are several systems which have been developed for avoiding accident and saving human life by using GPS and GSM. GPS is used to give intimation regarding location of accidents. GSM is used to send message from user's mobile. But all the previously developed systems are suitable or applicable when accident has been occurred but proposed system is used to avoid accidents by giving indication to both sides of vehicles. Indication is given by using lamp or buzzer. To overcome all the limitation in the previous systems, this system is designed which is very efficient and easy to understand.

II. EXISTING SYSTEM

There are number of techniques available to avoid accidents that are antilock breaking system, Adaptive Cruise Control, Anti Collision System, Electronic Break-force Distribution and Supplemental Restraint System Air Bags etc.

To avoid accident due to speeding and drunken driver one system is developed by using GPS, GSM, Accelerometer, HC-SR04 sensor, arduino and MQ3 gas sensor. When accident occurs sometimes ambulance take more time to reach that accident point or there is possibility of loss of human life because the time taken by the ambulance to reach the hospital. So to avoid this drawback researcher implemented a system, an automatic detection of accident through sensor provided in vehicles. [1]

Another system is developed for accident detection and tracking by using temperature, vibration, proximity and heat sensor. GPS receiver notes that latitude and longitude through antenna, it selects the nearest hospital, police station and relatives. When this location value is given to Google map the exact accident spot can be calculated. [2]

For avoid accident one more system has been developed by using MEMS sensor, temperature sensor. MEMS sensor is indicates that the tilting of the vehicle in 0^0 to180^0 C depends upon the direction of x, y, z. by using GPS and GSM the message will be sent to the nearest police station, hospital or relatives. [3]

By using accelerometer and alcohol sensor a system is developed to avoid an accident. In this system have three benefits. First is to prevent the vehicle from the accidental situation due to brawniness. Second is to detect the drunk drivers by using alcohol sensor and third is to indicate the break failure. [4]

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III. PROPOSED SYSTEM

Due to lack of attention, speed and new technology increases the chances of accident. India is at second rank in the accident overall world. When accident happens, life of human loses, which is very valuable. When road is curvature road at that instant more number of accident occur. On the curvature road driver at one side cannot see the vehicles at other side. Both vehicles may have high speed. Suddenly both vehicles are come in front of each other and at that time they cannot control their vehicles speed and accident happen and valuable life has lost.

To overcome this problem existing system we developed the new system in which accidents can be avoided using ultrasonic sensor. These sensors are placed at both the sides of the road. Total four sensors are used. Two sensors are placed at left sides of the road and two sensors are placed at right sides of the road. Two lamps or buzzers are used. Lamps will be glow and buzzer will ring loudly. One lamp is placed on the left side and second lamp is placed on the right side. Left side sensors are named as 1L, 2L and right side sensors are named as 1R, 2R. Suppose vehicles are coming from left side then cut first 1L line and then 2L line then controller knows that the vehicles are coming from left side so controller gives instruction to the right side lamp. Then lamp will glow or buzzer will ring on right side. Due to glowing lamp or ringing buzzer on the right side then person in the vehicle will know that on the other side vehicles is present and driver will be alert.

When vehicles are coming from right side then cut first 1R line and then 2R line then controller knows that the vehicles are coming from right side so controller gives instruction to the left side lamp. Then lamp will be glow or buzzer will be ringing on the left side. When there is glowing lamp or ringing buzzer on the left side then person in the vehicle will know that on the other side vehicles is present and driver will be alert. When the at the both sides of vehicles are present then both sides lamp will be glowing or bugger will be ringing. At that time both sides of the driver will be alert. Because of giving this indication both sides vehicles drivers will be alert so that they reduce their speed and drive carefully. This system not only avoids accidents but also saves the valuable human life.

IV. METHODOLOGY

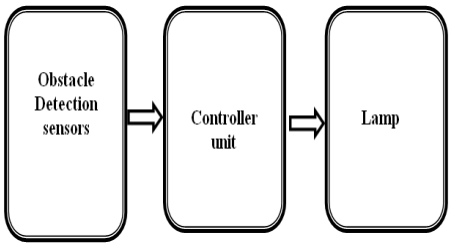

Fig 1: Block Diagram

A. Obstacle Detection sensor:

We require four obstacle detection sensors. There are various sensors are available that are IR sensor, ultrasonic sensor, Temperature sensor etc. we have chosen ultrasonic HC-SR04 sensor, due to cost and operating range. This sensor has following features.

Fig 2: Ultrasonic sensor (HC-SR04)

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Features:

1. Working voltage: DC 5V
2. Working current: 15MA
3. Working frequency: 40Hz
4. Maximum range: 4m
5. Minimum range:2cm
6. Measuring angle: 15 degree
7. Dimentions:45*20*15mm

B. Controller Unit:

Controller unit is the brain and key of our system. This controller unit contains all the information. This controller decides which lamp will be glowing out of two lamps. We have selected microcontroller Atmega328. Because this controller is economical, Easy to understand and operate.

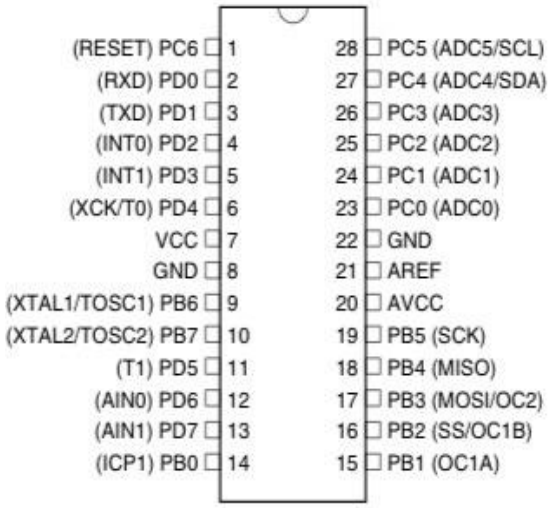

Fig 3: Microcontroller Atmega328

Features:

1. It includes High performance, low power 8 bit microcontroller.
2. Six PWM channel is present.
3. Fully static operation is present.
4. It requires low power consumption.
5. Temperature range:-40^{0}C to 85^{0}C.
6. External and internal interrupt sources.
7. Low power consumption at 1MHz.
8. Real time counters with separate oscillator.
9. Power on reset and programmable brown out detection.

C. Lamp or Buzzer:

Lamp is used for the indication. Because of this indication accidents can be avoided and valuable lives can be saved. We can replace lamp by using buzzer. This buzzer will be ringing. This lamp and buzzer is very important for this system. These are not expensive.

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V. CONCLUSION

In this system, ultrasonic sensors are used to detect the vehicles and indication is given by a lamp so accident can be avoided at a turning point. Because of this technique people identify that what is the position of the vehicle at the turning point. This technique is easy to implement. Avoid accident, and save lives.

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