



## **INTELLIGENT COLLISION PREVENTIVE SYSTEM USING ARDUINO MICROCONTROLLER**

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**Abstract-** Vehicle technology has increased rapidly in recent years, particularly in relation to braking systems and sensing systems. The widespread introduction of anti-lock braking has provided the building blocks for a wide variety of braking control systems. In parallel to the development of braking technologies, sensors have been developed that are capable of detecting physical obstacles, other vehicles or pedestrian around the vehicle. A method of preventing an accident using a technology is called ultrasonic. This project focuses on building a user-friendly device that specializes in detecting intrusions besides doing close range obstacle detection. Automobile safety can be improved by anticipating a crash before it occurs and thereby providing additional time to deploy safety technologies. Warnings can be like buzzer if the driver is approaching a pothole or any obstruction, driver may be warned in advanced regarding what the road entails. The project's ultimate aim thus finalized as, one to build a general, easy-to-use and versatile system that can prevent fatal accidents.

**Keywords:** Ultrasonic sensor, Arduino microcontroller.

### **I. INTRODUCTION**

The objective of this project is to develop a safety feature in cars to avoid colliding with a vehicle or an obstacle in the way. The main objective of this system is to help driver prevent car collisions due to blind spots and their carelessness while driving. Collision avoidance systems are especially useful in bad weather conditions. The sensors in the car would be capable of detecting even in the poor conditions and would inform the driver distance from the various objects in front of the car which will help the driver to drive safely in such poor conditions and a central microcontroller would also be able take decisions according to different situations. For example, fog affects visibility, the sensors would recognize another car and alert the driver of any dangers that lie ahead, giving the driver enough time to slow down, allowing him to escape from what could have been a bad accident.

Brakes are the most important components of a car as they are the primary source to bring the car to a halt. Failure to brake can result in a disaster and manufacturers are increasingly working to make breaking on their vehicles efficient for better passenger safety. Different vehicles use different types of brakes; while some use drum brake, some use a disc brake and then of course there are added technologies such as ABS and ESP which further aid better braking.

### **II. EXISTING SYSTEM**

The existing system of accident prevention uses alcohol detector, neck & head movement, victim analysis, These technologies have their limitations which need to be eradicated. Driver fatigue is one such problem due to which accidents occur. The Bluetooth system should be installed in the other automobile, in victim analysis the victim's heartbeat, pulse rate etc. are checked using sensors. In alcohol detector the alcohol level in the blood is checked whereas in neck-head movement how much the driver is drowsy is seen. These technologies don't take into consideration the distance between the automobile and approaching automobile

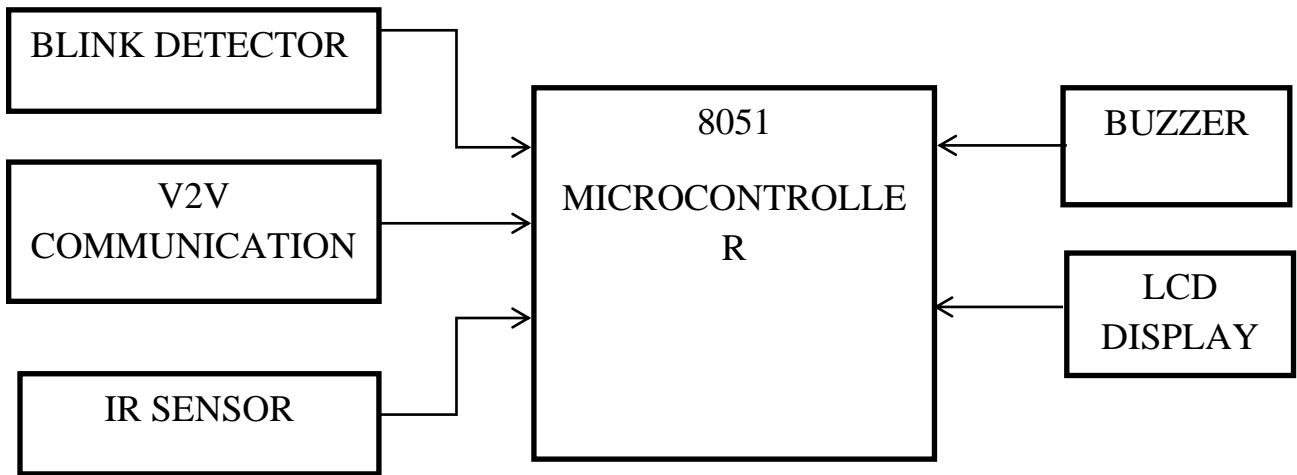


Figure 1. Block diagram

### III. PROPOSED SYSTEM

The idea is to prevent the accident by calculating the distance. There have been many technologies to avoid the accident but none of it used ultrasonic. The limitations of other technologies have been reduced to great extent. A method of preventing an accident using a technology is called ultrasonic. This project focuses on building a user-friendly device that specializes in detecting intrusions besides doing close range obstacle detection. Automobile safety can be improved by anticipating a crash before it occurs and thereby providing additional time to deploy safety technologies. Warnings can be like buzzer if the driver is approaching a pothole or any obstruction, driver may be warned in advanced regarding what the road entails. The project's ultimate aim thus finalized as, one to build a general, easy-to-use and versatile system that can prevent fatal accidents.

Many limitations in the existing system are tried to overcome in our proposed system. Our proposed system is about preventing fatal accidents using Ultrasonic. Our main goal is to calculate the distance between the automobile and an obstacle. Also there are technologies to apply brake and stop the vehicle before the accident could occur. The hardware requirements are power supply, micro-controller, ultrasonic sensor, DC motor, buzzer and LCD to display the distance between automobile and the obstacle. The software requirements are Arduino.

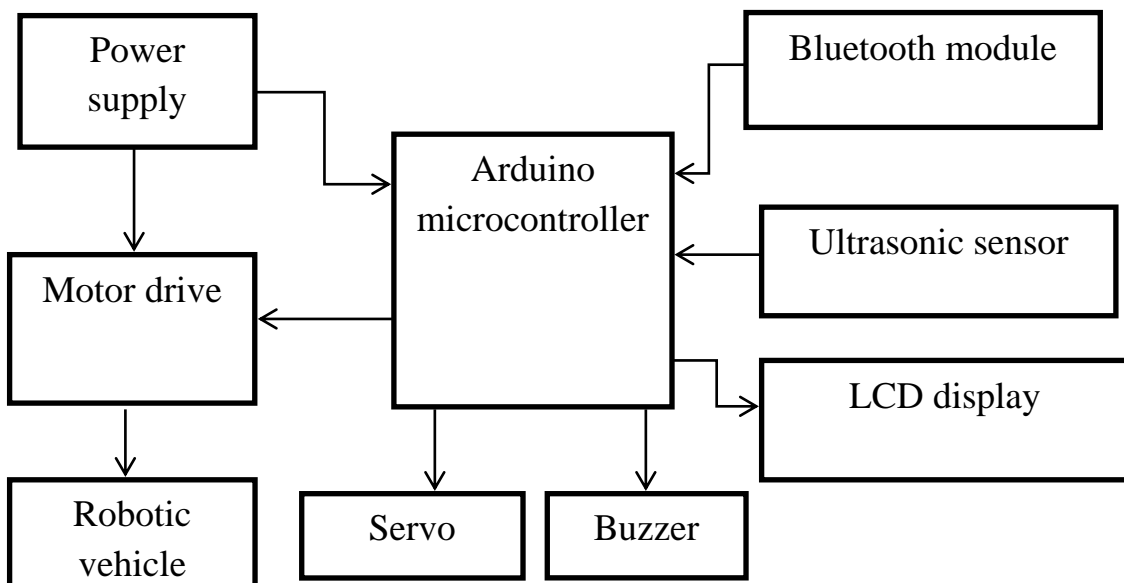
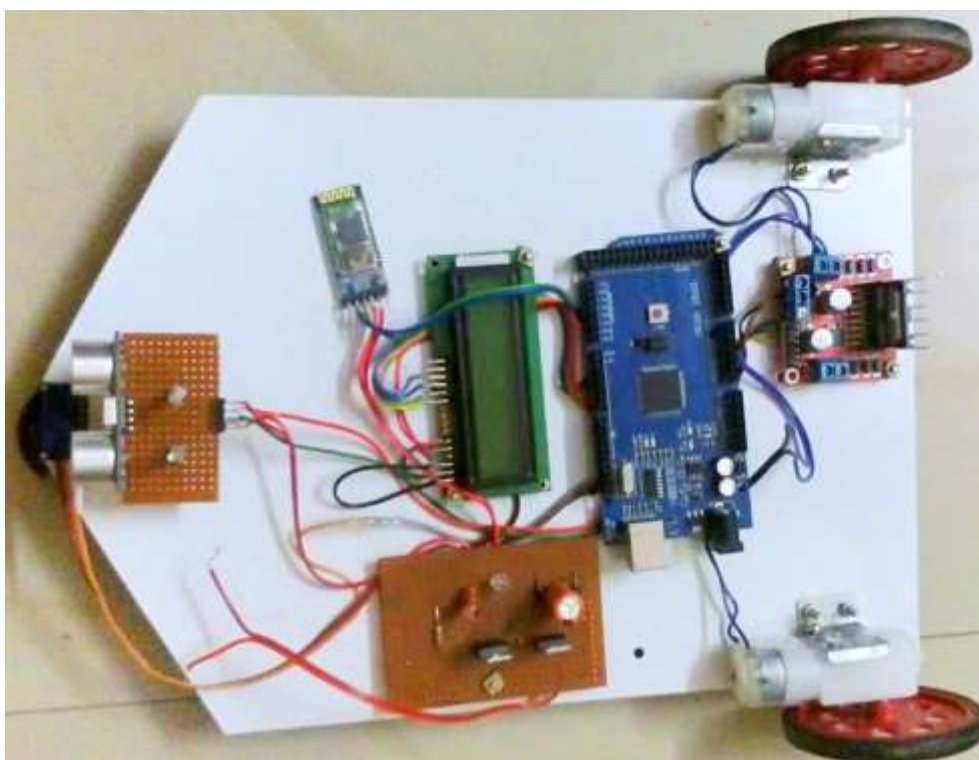


Figure 2. Block diagram

#### IV. WORKING

The Collision preventive system is engaged whenever the car is turned ON. The ultrasonic sensor fixed in the vehicle is used to detect the obstacle in front of the vehicle. The ultrasonic sensor is also used to calculate the distance between the obstacle and the vehicle. The distance between the vehicle and the obstacle would be preset. If the obstacle is recognized at the 90 cms then the alarm will go on. The alert system goes on at the decrease of every 15 cms. If still the driver doesn't pay heed to it, the LCD display would display the danger. Even if the driver doesn't show any attention and if the obstacle is recognized at 30 cms then the braking system is applied to stop the vehicle by sending the command signal to the motor drive which drives the robotic vehicle.

The Collision preventive system uses the servo motor to measure and to change the angle of the wheels of the robotic vehicle. When the distance between the object is less than 30cms and the car is stopped and the brake is applied. The vehicle is unable move unless the distance is more than 30cms. Servo motor plays the role here, when the angle of the wheel is changed the servo motor detects and signals the microcontroller. The microcontroller calculates the distance of the object and the vehicle in the direction of the wheel, if the distance is sufficient for the vehicle to pass through the brake is removed and the vehicle is allowed to move further and pass the obstacle. This collision preventive system also allows the driver to overdrive the braking system in case of emergencies. An individual button is provided so that, when the button is high the collision preventive system is overdriven. This helps the user to take the control of the vehicle braking system manually.



#### V CONCLUSION

The Intelligent collision preventive system negotiates the accident of the vehicle due to the carelessness of the driver. The system uses the ultrasonic sensor hence the detection of the vehicle in long-range can be detected. The driver is alarmed during the detection of the obstacle. This system will stop the vehicle in case of emergency, thus helping vehicles to avoid accidents in the road. By integrating the system in the vehicles the accident can be prevented.

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