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Car Collision Avoidance System

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Abstract: ***A collision avoidance system is an automobile safety system designed to reduce the rigorousness of a collision. Also known as precrash system, forward collision warning system, or collision mitigating system. It uses radar and sometimes laser and camera to detect an imminent crash. Once the detection is done, these systems either provide a warning to the driver when there is an imminent collision or take action autonomously without any driver input by braking or steering or both. Collision avoidance by braking is appropriate at low vehicle speeds. while collision avoidance is suitable at higher vehicle speeds.[1] Cars with collision avoidance may also be equipped with adaptive cruise control, and use the same forward-looking sensors.***
Keywords: collision, congested, Traffic safety, transmission, sensor networks

I. INTRODUCTION

Collision Avoidance systems, a subsequent step to collision mitigation, are one of the great challenges in the area of active safety for road vehicles. In India the total annual deaths due to road accidents has crossed 1.18 lakh, according to the latest report of National Crime Records Bureau (NCRB). If these deficiencies are not controlled at early stages they might cause huge economical problems affecting the road side networks. The main part of the work was to carry out a feasibility study on vehicle collision avoidance system using wireless sensor networks. The collision avoidance can be done by IR sensor. Vehicle collision avoidance system can be identified by IR transmitter and IR receiver. Through IR sensors the working of the DC Motor can be controlled, that is, speed of the vehicle can be controlled.

The device that converts electrical energy into mechanical energy is called as a motor. A DC Motor is a type of motor that makes use of the DC supply to produce mechanical output. The aim of developing this project is to control the speed of DC motor[6].Since the motor works at high voltage the motor cannot be directly connected to the microcontroller hence an interface called the motor driving IC is used in between the microcontroller and the motor. To achieve the speed control L293D motor driving IC .

The reason for using DC Motor specially is:

DC motors have higher controller efficiency, typical 98%.

II. BASIC PRINCIPLE

Our nature of work is used to avoid the collision of vehicles in all directions. In case the cars are moving in front direction still we need to worry about all the other directions like back and other two sides also.

III. FRONT AND BACK SIDE COLLISION

If the car is moving in front direction and any other vehicle comes too closer from the front or back side, that is, the vehicle comes in the range of the sensors then the transmitted signal from the transmitting sensor will get reflected from the vehicle and gets received by the receiving sensor and so a message will be sent to the dc motor and the buzzer and so the dc motor will stop and so the car also and an alarm will be activated by the buzzer[5] .

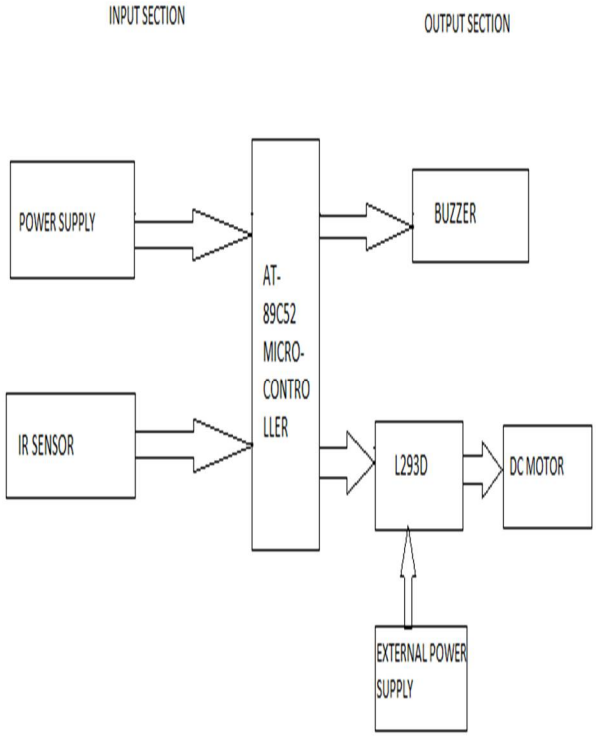
IV. LEFT AND RIGHT SIDE COLLISION

In case the car is going in front side if there is any vehicle coming from side direction then our both sides of the sensor will detect and send the message to the buzzer and the dc motor, and the dc motor will decrease its speed, that is, the car will slow down and an alarm will be activated by the buzzer to make driver aware of the situation.

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V. SYSTEM STRUCTURE



Block Diagram

VI. ADVANTAGE

Collision avoidance systems would reduce the number of accidents to a great extent. Accident reduction would also help reduce vehicle-hours of delay[2]. According to the study conducted by Sullivan, around 40 percent of accidents occur in travel lanes, 10 percent on the median shoulder and the rest on the right shoulder. During congested periods an average accident can induce 500 to 1000 vehicle hours of delay . According to National Highway Traffic Safety Administration some of the collision-avoidance systems could prevent 1.1 million accidents in the United States each year and would save 17,500 lives and $26 billion in accident-related costs . "Greyhound Lines have installed systems on its bus fleet, which give collision warnings for the front of the vehicle and lane change warnings for obstructions in the driver's blind spot. As a result, Greyhound's accident rate fell 21 percent from 1992 to 1993". Simple collision avoidance systems that prevent backing collisions are available at low costs. These systems could help reduce the number of collisions that are very common in the parking lots.

VII. DISADVANTAGE

These systems might produce false alarms, which might make the driver to discard the warnings. The frequency of the audio alarms has to be carefully designed so that it is not irritating to the driver. Increased speeds will reduce the headway and would increase the probability of a severe accident in the event of malfunctioning of a collision avoidance device. Some of these systems might make driver lose control over the vehicle, this would make he drivers dislike the deployment of collision avoidance systems[4]. More extensive research in this area would help the engineers to design a foolproof system that is more reliable, economical and safe.

VIII. APPLICATIONS

The various applications of this project is listed as

A. It can be used in cars in case of brake failure.

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B. It can be used for speed controlling etc.

IX. CONCLUSION

Collision avoidance systems if carefully designed would increase the situation awareness of drivers by eliminating or decreasing the human errors. These systems would bring about a major change in solving traffic safety related problems. Consideration of human factors in the design of the collision avoidance systems plays a very important role. Human centered design would make them more acceptable and useful to mankind.

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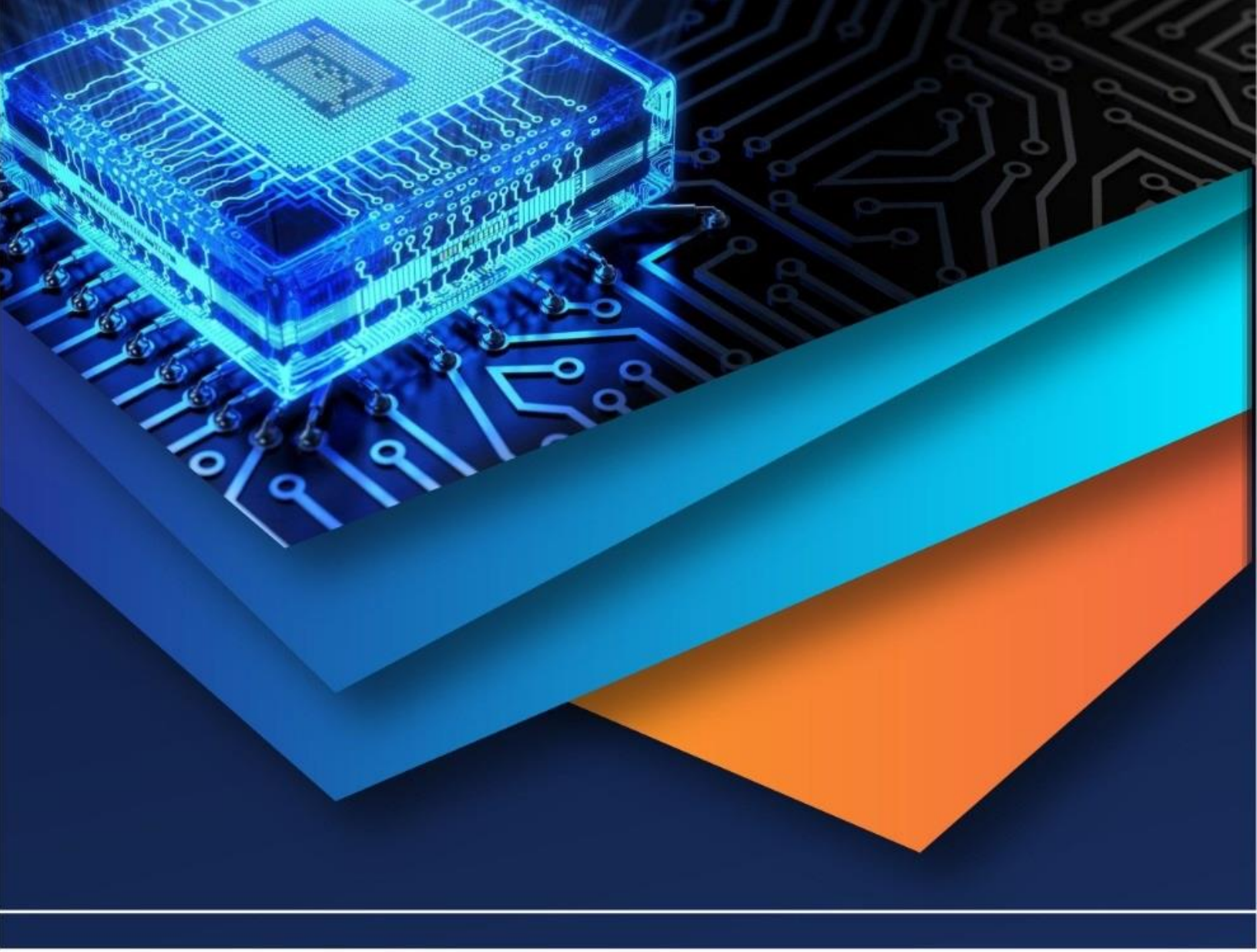
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