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Auto Braking System

Sai Shinde[1], Kunal Aher[2], Aniket Gaikwad[3], Aditya Sonawane[4], Jayesh Chavan[5]
Assistant Professor, Department of Mechanical Engineering[1]
Students, Department of Mechanical Engineering[2-5]
Santosh N Darade Polytechnic, Yeola

Abstract: *Road accidents are increasing day by day due to human error, delayed reaction time, and lack of attention while driving. To overcome this problem, an Auto Braking System using Arduino is proposed in this project. The main objective of this system is to automatically apply brakes when an obstacle is detected at a critical distance, thereby reducing the chances of collision and improving vehicle safety.*

The proposed system uses an Arduino microcontroller as the main control unit. An ultrasonic sensor is used to continuously measure the distance between the vehicle and an obstacle in front. When the sensor detects an object within a predefined safe distance, the Arduino processes the signal and activates a motor driver circuit connected to a DC motor or servo motor that represents the braking mechanism. The braking action is applied automatically without driver intervention. A buzzer and LED are also included to provide an alert warning to the driver before braking is applied.

This system works on the principle of distance measurement using ultrasonic waves. The sensor emits ultrasonic pulses and receives the reflected waves from the obstacle. Based on the time taken for the echo to return, the distance is calculated and compared with the threshold value programmed in the Arduino. If the distance is less than the critical value, the braking system is triggered instantly.

The proposed Arduino-based auto braking system is cost-effective, reliable, and easy to implement, making it suitable for low-cost vehicles and educational purposes. This project demonstrates how embedded systems can be effectively used to enhance automotive safety. With further development, the system can be integrated with real vehicles to reduce accidents and save lives.

Keywords: Auto Braking System, Ultrasonic sensor, Motor driver circuit, DC motor or servo motor

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