

A REVIEW PAPER ON INTELLIGENCE BRAKING SYSTEM

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ABSTRACT

In today's era the increasing accident number is, something that needs to be worried about. There are certain ways with which we can decrease the number of accidents. Road accidents have become common these days. Accidents mostly occurs because of failure of braking system. Therefore, the vehicles are equipped with many safety devices. Now days most popular of them include traction control system (TCS), anti-lock braking system(ABS),and stability control system(SCS).

Keywords: Brakes, Ultrasonic Sensor, Microcontroller.

I. INTRODUCTION

The automobile industry is producing day by day vehicles at a very high rate. The reason for this is that everyone wants own a four/two-wheeler. Not only that industrial growth has lead to increase in heavy utility vehicles. As a result, number vehicles have increased at an alarming rate. This has led to increase in traffic congestion on roads. As a result, number of accidents have increased. This is because the driver reacted late or made a judgmental error. Nearly 1.3 million people die in road crashes each year, on average 3,287 deaths a day. An additional 20-50 million are injured or disabled. More than half of all road traffic deaths occur among young adults ages 15-44. Many of these accidents could have been avoided or they would have been less severe, has the driver applied the brakes at the right time. Also, there may be failure of brakes. Unfortunately, the time required by driver to understand the potential accident situation, compounded with driver's delayed reaction time in applying brakes, usually causes a lag between the indentation of a potential accident situation and execution of the corrective actions that will prevent the accident. Hence, in such emergency situation an efficient control mechanism has to be employed to avoid accident. Generally, a car brake is operated manually as the driver pushes the brake pedal. A lot of accidents can be prevented by automating the task assessing the situation and deciding the amount brake pressure to be applied. In that case, the driver will have a companion to help him along the road. There are two issues related with design of intelligent braking system. Its name intelligent is given because it can take decisions automatically depending upon the input from ultrasonic sensors with the help of Microcontroller. The system upon detecting an obstacle can initiate an action to avoid collision. The system includes ultrasonic wave emitter provided on the front portion of a vehicle which used to produces and emit the ultrasonic wave in forward direction of vehicle . ultrasonic receiver is also provided which receive a rejected ultrasonic wave signal. A microcontroller used to control the vehicle speed and apply the brake for stop the vehicle.

II. LITERATURE REVIEW

Hemalatha B K, et, al.,[1] [2016], Paper comprises the use of Infrared sensors for obstacle detection with help of PIC microcontroller. This based on microcontroller technology for collecting data related to speed and transmitting it through transceiver to a base station that analyzes the transmitted data and takes appropriate decisions Related to speed limit and control requirements.

Nishad Vivek Kumbhojkar, etc. al [2], [2013], paper comprises of the use of ultrasonic sensors with help of PIC microcontroller, transducers and servo motor braking mechanism.It is intended to use in vehicles where the drivers may not brake manually, L but the speed of the vehicle can be reduced

Venkatesh Babu, R. Hariharan [3], introduced a system electronically controlled automotive braking system termed as 'automatic reverse braking system'. They used an IR sensor to transmit the infra-red rays. IR transmitter transmit infra-red rays this ray detects the obstacle in path. If obstacle is present in path, reflected

rays received by IR receiver. IR sensor sent signal to control circuit; control circuit activate the solenoid valve. The solenoid valve passes compressed air in double acting pneumatic cylinder. Pneumatic pushes a piston forward and brakes are applied gradually and suddenly due to piston movement. The braking speed is controlled by ' flow control valve'

Ashwin Francis, Abel Antoo, Jerald John, Augustin Sagar, Sreejith [4], proposed 'intelligent braking system' for automotive vehicles to decrease the number of accidents by an easy solution of controlling the speed of the vehicles. This system uses GPS coordinates to find the present zones that are the most accident vulnerable like schools and hospital areas. When the vehicle enters to this zone, system automatically limit the speed by applying a brake. The system was equipped with Electronic Brake Control Module (EBCM), Arduino (microcontroller), Bluetooth module, and a GPS module.

III. MAIN COMPONENTS

ULTRASONIC SENSOR

Ultrasonic detecting and ranging devices used of high- frequency sound waves to detect the existence of an object and detecting its range. These systems either measure the echo reflection of the sound waves from objects or detect the interruption of the sound beam because the objects pass between the transmitter and receiver. Such as any animal, vehicle & Person. An ultrasonic sensor naturally uses a transducer that produces an electrical output signal in response to the received ultrasonic wave. In such case, the horizontal aperture angle minimum of 8 degrees for a distance of 75 Meter

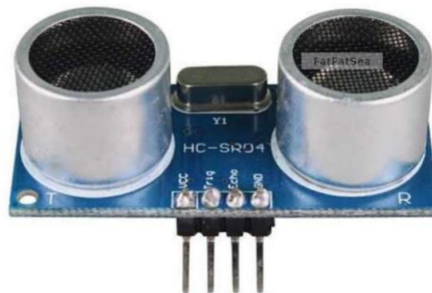


Figure 1: Ultrasonic Sensor

MICROCONTROLLER

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital output/Input pins (of which 6 can be used as PWM outputs), 6 analog input, a USB connection, a 16 MHz ceramic resonator, a power jack, an ICSP header, and reset button. It contains everything needed to support the microcontroller; simply connect with a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. "Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the newest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions. Arduino is an open-source platform used for producing electronics projects. Arduino consists of both a microcontroller and a bit of software, or IDE (Integrated Development Environment) that runs on your computer, accustomed write and upload code to the physical board. The Arduino doesn't need a separate piece of hardware (called a programmer) so as to load new code onto the board – you'll be able to simply use a USB cable. Additionally, the Arduino IDE uses a simplifies version of C++, making it easier to find out to program.

IV. RESULT AND DISCUSSION

In this present work , built a model for ultrasonic distance measurement for stationary obstacle is obtained. Controlling the speed of vehicle using Sensor and Microcontroller accordingly to predetermined distance is shown. An ultrasonic sensor is cheaper and as well as less demanding of hardware than other types of major sensors presently used, such as the sensors based on computer vision or radar, is used to measure the distance between vehicle and the obstacle as well as other movemental objects. Main relative speed of the vehicle with respect to the obstacle is estimated using consecutive samples of the distance calculated. These two quantities are used by the control system to calculate the actions on both the accelerator and also the brake, thus to adjust

the speed in order to maintain a safe distance to prevent accidents. As ultrasonic sensors can detect any kind of obstacle, least reduce the injuries occurring this system can also prevent collision of the vehicle with pedestrians. Since the control system does not use the absolute speed to calculate the safety distance as done by the currently existing systems, the interaction with automotive electronics is limited to actions on the accelerator and brake. This situation,, coupled with the fact of lower cost of ultrasonic sensors compared with other type of sensors, could facilitate the application and mounting of the system in many low-end vehicles, helping to improve comfort and safety and offer a hassle-free driving experience at a reduced cost.

V. CONCLUSION

We study about that all research paper which interact with intelligence braking system and the components using for Intelligence Braking System.Design of intelligent brake applications basically depend upon effectiveness of Ultrasonic sensor and microcontroller (motor driver),and controlling the speed of vehicle accordingly to programmed distance is revealed in the study done by our team. Our present work comprehended us that enactment of this smart system can achievable and of real time use. Approaches and conclusions that we present are somewhat preliminary and need further significant research

VI. FUTURE ASPECTS

This will make the safe driving process using enhanced well braking system and design.The rpm counter is use helpful to measure relative velocity. This will ensure quick breaking response.Reduce road accidents due to delay breaking. By using a greater number of ultrasonic sensor and IR sensor we can develop it as a driverless vehicle.

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VII. REFERENCES

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