

## Review Paper on – Intelligent Braking System

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**Abstract** – The braking system was designed and applied on a car to form the driving process safety using embedded system design. Most of the accident occurs due to the delay of the driving force to hit the brake, so during this project work braking system is developed specified when it's active it can apply brake depending upon the thing sensed by the ultrasonic sensor and speed of car. Currently, vehicles are often equipped with active safety systems to cut back the possibility of accidents, many of which occur within the urban environments. The foremost popular include Antilock Braking Systems (ABS), Traction Control and Stability Control. Of those systems employ differing kinds of sensors to constantly monitor the conditions of the vehicle, and respond in an emergency situation. An intelligent braking system contains an ultrasonic wave emitter provided on the front side of a car. A receiver is additionally placed on the front portion of the car and getting a reflective ultrasonic signal. The reflected wave (detected pulse) gives the gap between the complications and also the car and RPM counter gives speed of car. The microcontroller is functioning to manage the braking of the vehicle supported the detection pulse information to push the foot lever and apply brake to the car remarkably for safety purpose.

**Key Words:** brake, ABS, Sensor, Microcontroller, Intelligent

### 1. INTRODUCTION

Braking systems of business vehicles were always given the absolute best importance concerning problems with safety and particularly active safety. Inappropriate braking of these vehicles may cause heavy accidents thanks to relatively longer stopping distances and better energy output of brakes particularly within the case of car combinations. The conventional medium used for brakes (compressed air) are often now controlled with the speed and precision offered by modern electronic abilities. IBS introduced in commercial vehicles providing swift brake response and release for every single wheel. The rapid quantity provided by the electronic control are often used for critically shortening the braking distance by introducing advanced control of braking system operation. Such a elaborate task imposed to the control of braking system can't be supported the driving force abilities and want to be done independently of the driving force. An improved IBS braking forces management would definitely enable to realize the given task. The advanced strategy for the braking force management, proposed

here, relies on intelligent controlling of the braking forces distribution between the front and rear axle of power-driven vehicle and/or between towing/trailer combination and/or between tractor/semi-trailer. Intelligent braking system features lots of potential applications especially in developed countries where research on smart vehicle and intelligent highway are receiving ample attention. The system when integrated with other subsystems like automatic traction system, intelligent throttle system, and auto cruise system, etc. will end in smart vehicle maneuver. The driving force at the tip of the day will become the passenger, safety accorded the absolute best priority and also the journey are visiting be optimized in term of it slow duration, cost, efficiency and luxury ability. The impact of such design and development will cater for the need of up to this point society that aspires quality drive moreover on accommodate the advancement of technology especially within the realm of smart sensor and actuator. The emergence of digital signal processor improves the capacity and features of that microcontroller. The overall system is meant so as that the value of inter-vehicle distance from infrared laser sensor and speed of follower car from speedometer are fed into the DSP for processing, resulting in the DSP to actuator to function appropriately.

### 1.1 NEED OF PROPOSED SYSTEM

Accidents occur because of technical problem within the vehicle or because of mistake of driver. Sometimes the drivers lose control over the vehicle and sometimes accident occurs because of rash driving. When the drivers come to grasp that vehicle goes to collide they become nervous and that they don't apply the brakes. Majority of the accidents occur this fashion. The system designed will prevent such accidents. It keeps track of any vehicles ahead. It'll continuously keep the track of the space between the 2 vehicles. When two vehicle come dangerously close the microprocessor within the system actuates the brakes and it'll stop the vehicle.

### 2. EXISTING SYSTEM

Honda's idea of ABS which helps the rider get stress free braking experience in muddy and watery surfaces by applying a distributed braking and prevents skidding and wheel locking moreover as Volvo which was equipped with laser assisted braking. This can be capable to sense a collision up to 50 mps and apply brakes automatically.

ABS can activate only help if the rider applies it in right time manually and maintains the space calculations. ABS has its own braking distance.

### 3. PROPOSED SYSTEM

In this section we describe about the working flow of complete system. we are designate the major part of the system and also we explain the working flow of proposed system.

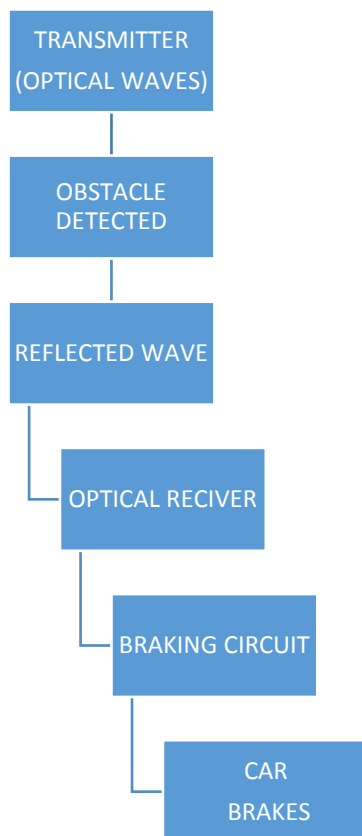


Fig 2. working flow daigram

### 4. SYSTEM ARCHITECTURE

#### 4.1. Ultrasonic Sensor

Ultrasonic ranging and detecting devices 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. An ultrasonic sensor naturally uses a transducer that produces an electrical output signals in response to the received ultrasonic wave. In such case, the horizontal aperture angle minimum of 8 degrees for a distance of 75 meter between vehicles.

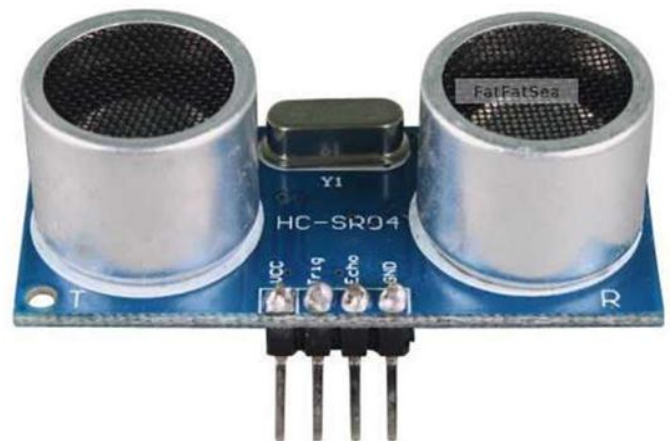


Fig 2. Ultrasonic Sensor

#### 4.2 Hydraulic Braking System

Hydraulic braking system works on Pascal law which states that “pressure force acting inside the system is same overall the directions”. Per this law when the pressure is applied on a fluid will travel equally altogether the directions hence the uniform braking action is applied on all four wheels. When the force applies force on the foot pedal, the brake cylinder experiences force at the connecting rod which causes the movement of piston inside the brake cylinder chamber, fluid inside the chamber rushes towards the brake caliper hence the pistons within the caliper experiences the pressure of fluid which makes the pistons to push the brake pad against the rotating disc with the brake force. Hence the mechanical energy of the vehicle is converted into heat and dissipated to the environment resulting the vehicle to prevent within the stopping distance and stopping time with deceleration.

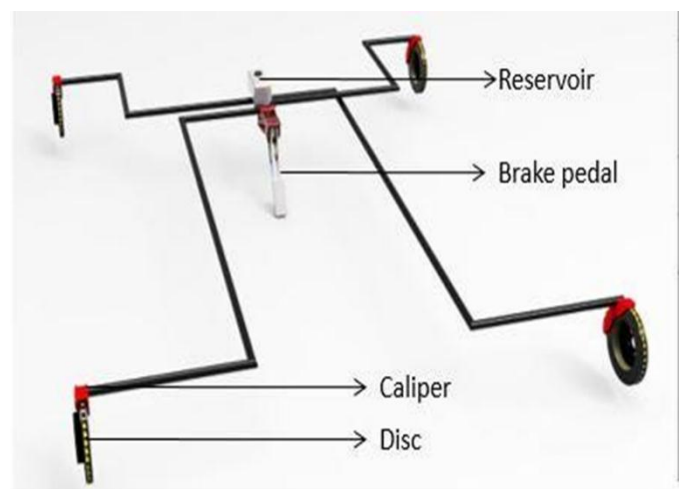


Fig 3. Hydraulic Circuit

### 4.3 MICROCONTROLLER

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 simplified version of C++, making it easier to find out to program.

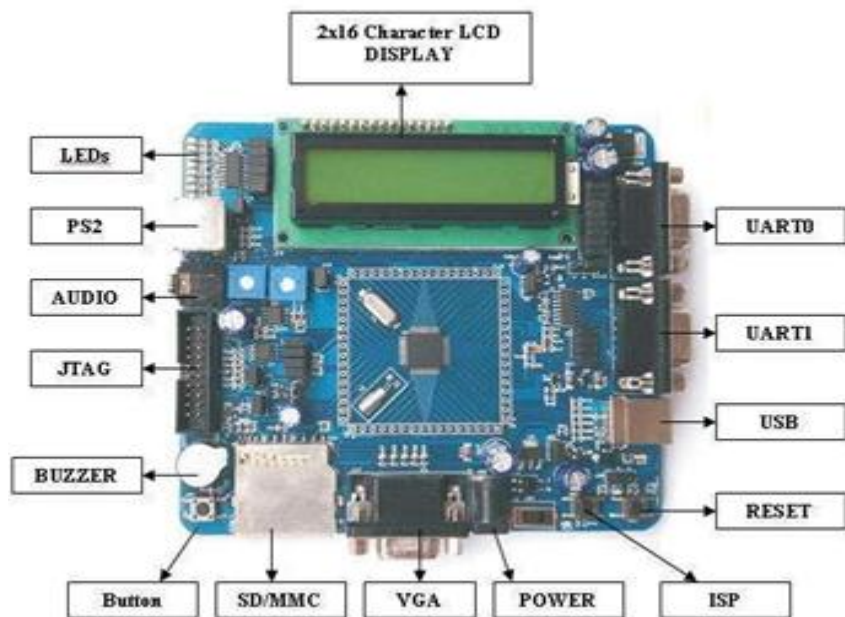


Fig 4. Arduino Uno Microcontroller

### 5. CONCLUSION

The Intelligent Braking system, if executed can avoid many accidents and might save individual human lives and property. Implementation of such a complicated system are often made compulsory just like wearing of seat belts in order that accidents are often averted to some extent. Our Intelligent braking system provides a glimpse into the long run of automotive safety, and the way way more advanced these individual systems are often for avoiding accidents and protecting vehicle occupants after they are integrated into one system. The long run of automotive safety is over just developing new technology; it's shifting the approach to safety. Intelligent Braking System approach represents a major shift from the standard approach to safety, but it's fundamental to achieving the substantial benefits.

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