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# Safer Bike Ride by Controlling Bike Speed Using Microcontroller

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**ABSTRACT**

*Life safety applications are being developed and creating a new era of creativity and these applications are more sophisticated to use and user friendly which also makes machines to think and make own decisions. Accident is a specific, unpredicted external action that happens unexpectedly with no apparent or deliberate causes. With the increasing number of bike riders and also the number of accidents happening each year our paper focuses on the methods that can be implemented to ensure safety while driving. Violation of traffic rules and sudden brake's are the major cause of these accidents. Even though helmets are made mandatory accidents are happening everywhere due to over speed which leads to skidding. In our project, message transmitting sensors are equipped with the controller of bike. The most important feature of the bike is that it detects the distance of the successive vehicle and if the rider reaches the minimum distance to successive vehicle, it maintains a constant speed by controlling the fuel flow in the bike. This is applicable when traveling at top gears.*

*This advanced development is bringing about a new era of productivity for the latest ideas on an astounding scale, understanding their efficiency, speed and functionality.*

***Keywords:Coil, Converters, Microcontrollers, sensors, visor interface.***

## I. INTRODUCTION

However safety measures are taken in and around the world for various activities, safety measures must be taken to avoid road accidents. Especially, motor-bike accidents are increasing day by day and hey continue to increase 24% of the population. The reason for developing the system is, according to survey nearly "377" people die in road accidents. Every day which is mainly due to over speed and skidding of motor-bikes.

Our main aim of the project is to ensure safety for the motor-bike riders at top gears. There are many reasons for road accidents such as drunk and drive, rash driving, over speeding etc. in which over speeding is one of the most important issue. Applying brakes at very high speed leads to a very serious situations even though motor-bike riders wears helmet. This condition occurs only when the motor-bike riders does not maintain a distance between their successive vehicles. For this purpose, we are using sensors for detection which will be performing at high degree of accuracy. As these applications are standard and sophisticated to the organizations, many companies are willing to implement these new ideas.

Fuel control system can be defined as controlling the fuel flow in the tube to the carburetor where it gets mixed with the air (i.e. oxygen) and sent to the combustion chamber which is present inside the engine. Finally, the fuel gets burned and the maximum speed is given to the motor-bike.

In this study, we designed and implemented Fuel Control System in order to maintain the constant speed of the motor-bike whenever obstacle is detected in order to avoid accidents.

Bikes are the wonderful invention in the early decades of 20$^{th}$ century which are used as the preferred means of transport till now. Our system aims in providing a safer bike ride by the use of the sensor to detect the distance of successive vehicle and maintains the constant speed by controlling fuel flow that helps the rider to maintain minimum distance between the successive vehicle.

## II. HEADINGS

### 1.Available Technology

The automobile industry is a wide range of organizations that involved in the design, manufacturing and selling of motor-vehicles and heavy duty vechicles. And its influence is growing steadily. Autonomous vehicles rely on GPS systems, sensors to detect the obstacles and the behavior of the vehicles can be traced easily on the road.

Electric cars are implrmented to save the trace of fossil fuel which acts as the source for many commercial purposes. It also equipped with user interface like LED displays, automatic braking systems, giving information about the speed and this will helps the rider to concentrate only in driving.

Now the available technology uses a wireless communication, which is interconnected to the smartphones. The sensors installed in the device detects the emergency situations like accidents, collision between two vehicles, thus enabling the riders, a safe journey.

1.1Proposed Technology

Our system aims in providing a safe bike ride by the use of the sensor that helps the rider know the successive vehicles and the fuel flow is limited to maintain the constant speed at that period of time. When a person starts to ride the bike at top gear(i.e speed>40 km/hr) the sensor checks for the obstacle in front of the rider and the bike's coordinate system starts. Whenever the sensor connected in front of the bike detects any vehicle in front of the bike in minimum distance, a signal is sent to the microcontroller.

The components of this system are small and ensuring that it will not create any disturbance to the rider. So the rider will feel free to ride his/her bike.

### 2.Components used

Sensors are the application to interact with the world more physically. With the use of these sensors, detection and monitoring the current situation is possible and more accurate. These sensors will be helpful for the users to sense for the objects and obstacles.

In our system, sensors are used to detect the obstacles within the minimum distance and alerts the system with passing the signal to the microcontroller. By finding the obstacle and controlling the speed will be useful and safe for rider. The sensors also detects the obstacle very accurately.

### 3.Working Principle

The principle used in this project is Electromagnetic Induction.

### 3.1**Detecting Mechanism**

When the motor bike is started, the sensors and microcontroller connected to the bike is also switched ON. The speed of the motor-bike is also calculated and when the rider reaches the maximum speed in other words travelling at the top gear (speed>40 km/hr), the sensors connected to the bike comes into play. All the sensors should be operating at the speed of 60ms.

The sensors scans the environment at both the sides of the motor-bike and calculate the distance between the vehicles by sending and receiving the signals, thereby alerts the rider through the LED lights which is connected to the microcontroller.

The sensor connected in front of the motor-bike checks for the obstacle. When any obstacle is detected by the sensor, a signal is sent to the microcontroller and the fuel flow is limited to the carburettor. A particular amount of fuel is given constantly so that speed of the motor –bike is maintained. The speed of the motor-bike can be increased only when the rider is free from obstacle. In other words, the rider should move away from the successive vehicle in order to increase the speed to next level.

The rubber tube which acts as a path for the fuel flow from the petrol tank to the carburettor. The rubber tube is enlarged in between for certain area and then the tube is made narrow as normal. In the enlarged section of the tube, a stainless steel ball is placed in centre part of the ball. This stainless steel ball is placed under the enlarged tube in the curved area.

Whenever obstacle is detected by the sensor, a signal is sent to the microcontroller and a dc pulse is supplied and this pulse is converted to ac supply to induce magnetic field in the coil.

This magnetic field lifts the stainless steel ball to upper portion of the enlarged tube and the fuel flow is limited to give constant speed in that current situation. The maximum speed of the motor bike is directly proportion to the field produced in the coil. The working mechanism is shown in Fig.2

## III. INDENDATIONS AND EQUATIONS

### 1.Calculation of distance between Two Vehicles

In two dimensions, let's take the values for $(x_1,y_1)$ and $(x_2,y_2,)$.

Let $x_1 = 3$and $x_2 = -2$, now the distance d can be calculated, the distance between the two vehicles, as follows:

$d = |x_2 - x_1|$

$= |-2 - 3|$

$= |-5| = 5$ miles.

In three dimensions, let's take the values for $(x_1,y_1,z_1)$ and $(x_2,y_2,z_2)$.

For example, let's say that two vehicles are approaching us as follows:

One is about 5 kilo meters in front of us, 4 km to the right of us,

and 2 miles below us,

while the other is 6 km behind us, 3 km to the left of us,

and 8 km above us. If we represent the positions of these vehicles with the

coordinates (5,4,-2) and (-6,-3,8),

we can find the distance between the two as follows:

$d = \sqrt{((x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$.

$d = \sqrt{((-6- 5)^2 + (-3 - 4)^2 + (8- (-2))^2)}$

$d = \sqrt{((-11)^2 + (-7)^2 + (10)^2)}$

$d = \sqrt{(121 + 49 + 100)}$

$d = \sqrt{(270)} = 16.43$ km

## IV. FIGURES AND TABLES

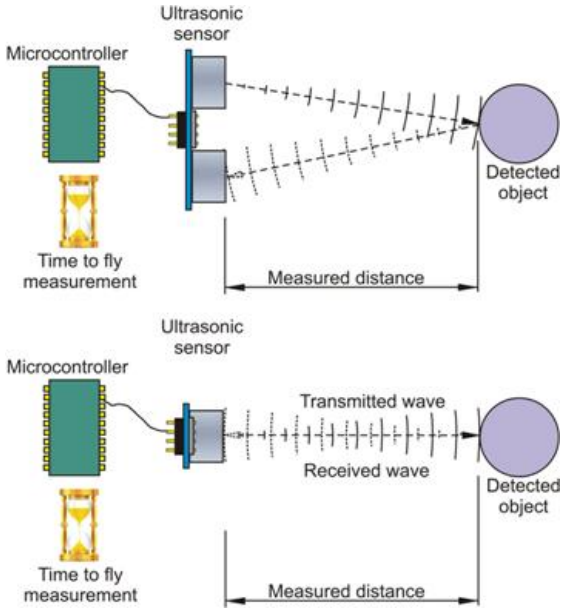


**Fig 1: Operation of an Ultrasonic Sensor**

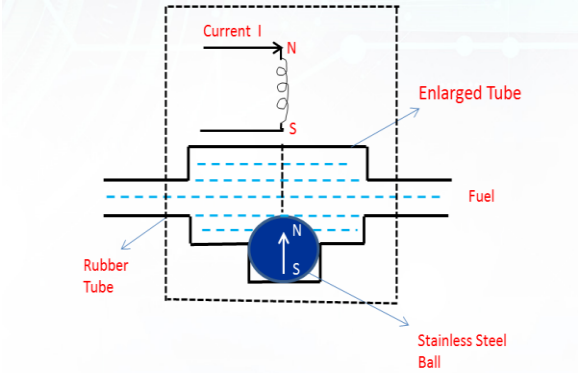


**Fig 2: Working Mechanism**

## V. CONCLUSION

Our main aim of the project is to maintain distance between two vehicles while driving at top gears. The distance provided between the vehicles by this mechanism will give the motor-bike riders to take time to think

and take decisions perfectly in any emergency situations. Our system has huge potential to drive a new generation with creativity. This idea will bring satisfaction and fulfils the consumer's expectations to ride motor-bike with safety. The world of the future will be more demanding against the limitations of our own intelligence. These technologies will make the biggest impact on our lives in the forthcoming years.

Innovations in the safety side must be implemented in the future and these advances in technology must be taken into account by good capital investments and to become an important concept for road safety, especially for two-wheeler riders. It is important for the automobile industry to take adoptive and safety measure in order to maintain road safety and security for motor-riders through innovative ideas. This paper adds safety and security to the motor-bikes riders in forthcoming years**.**

## Applications

The ultrasonic sensors used in this technique detects the vehicles in three dimensions. When the obstacle is detected by the sensors, the rider is alerted by the light signal through the LCD monitor connected with microcontroller. This gives the riders to tackle the approaching vehicles with utmost confidence and the distance is being measured in the most accurate way.

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