

# Safety of Two Wheeler Riders

**Shubhangi Mashalkar, Pramila Wale, Shraddha Gaikawad, Ruchika Gajul,  
Srushti Kakmare, Janhavi Tambake**

Department of Electronics And Telecommunication  
Shri Siddheshwar Women's Polytechnic Solapur, Maharashtra, India  
ruchikagajul1@gmail.com

**Abstract:** *Two wheelers are the most economical way of transport. Owing to this, there has been an increase in the number of two wheelers especially on Indian roads which has led to increase in the number of accidents.*

*One of reason is riding triple seat as well as taking sharp turns. Keeping in mind the above problems, an integrated system is designed which will ensure the safety of riders. The integrated design consists of an automatic triple seat detection and continuous tracking of tilt of two wheelers with respect to the road. The components are integrated in such a way that the engine of the two-wheeler will start only if the seats occupation is in limited range.*

*The tilt sensing device will sense the inclination of vehicle with respect to ground and as soon as the level go below the threshold value of angle of inclination, a warning beep will ring, intimating the rider that the vehicle may slip.*

**Keywords:** Tilt Sensor, IR Sensor, Micro roller Switch, PIC controller etc.

## I. INTRODUCTION

With the surging economy, vehicle population expanded in the country during the last decade. Though road networks have also improved, mounting pressure on roads from expanded vehicle population has aggravated safety issues. Credible data about road accidents are not available, still, preliminary reports indicate that Indian roads are witnessing higher incidence of accidents. As per the Supreme Court appointed Committee on road safety, nearly 150000 people die in road accidents in the country every year. Another 5 to 7 lakh people are believed to be injured, leading to handicapped status. Government has made several efforts to enhance road safety in recent years. A major one was the appointment of the Committee on Road Transport and Traffic Management (Sundar Committee, 2007). In the field of automotive if a vehicle is designed for a particular per person riding capacity considering the aspects of safety, design and power exceeding those limits puts the driver and pillion riders at considerable risk. With a step ahead, we are trying to detect and limit the number of persons sitting on two wheelers. As per the traffic rules in India the maximum number of persons cannot exceed two, i.e. a driver and a pillion rider. Despite of the ban, people tend to break the rule. Two Pillion riding is also a root of a lot of accidents happening now-a-days. In account of this problem, the integrated circuit is designed which detect the triple seat. The integrated design consists of an automatic triple seat detection in such a way that the engine of the vehicle will start only when the seats occupation is in limited

### 1.1 Block Diagram

Block diagram of the system consist of two circuitries, the triple seat detection circuit and tilt detection circuit as shown in the figure. The output of the triple seat detection circuit is connected to the PIC microcontroller.

Depending on the status of the switch the microcontroller will send the pulse to the relay.

The relay is turned ON if the limit exceeds, due to which the circuit between the engine and the ignition breaks. In continuation with triple seat detection, the tilt detection is done with the help of tilt sensor.

Whenever the vehicle is tilted beyond a specific limit, a LED indication is given and the message will get display on LCD accordingly.

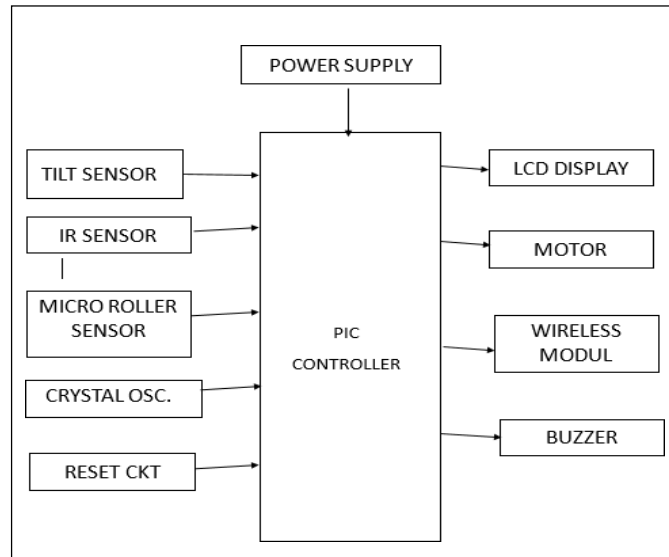


Fig 1: Block diagram of safety of two wheeler riders

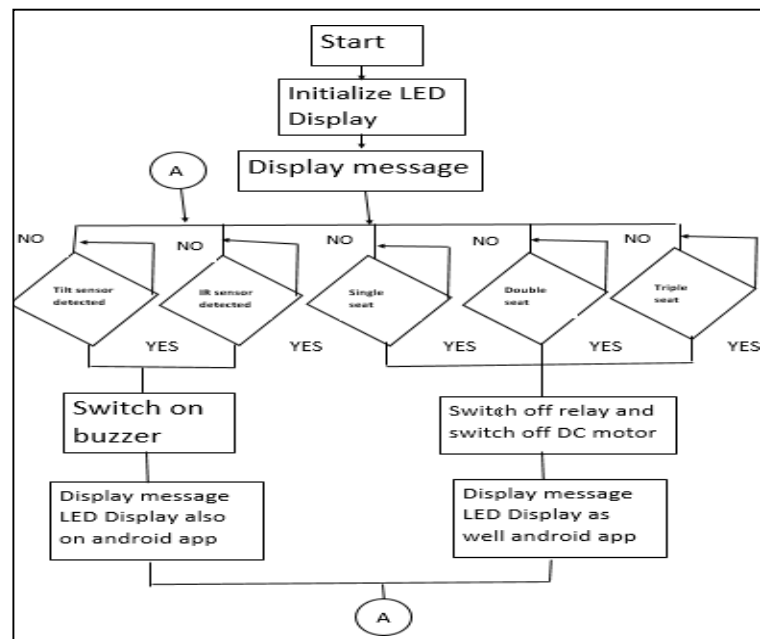


Fig 2: Flow chart

Start

Initiatze LED display

Display welcome message, check if IR sensor detected for helpmate operation then switch off the buzzer 4.If IR sensor is not detected then switch ON the buzzer and display the message on LED display and also onthe android app

If Tilt sensor is detected then switch ON buzzer and display message on the LED display and also on theandroid app

If Single seat Patti switch is detected then display message on the LED display and also on the android app

If Double seat Patti switch is detected then display message on the LED display and also on the android app

If Triple seat Patti switch is detected then display message on the LED display and also on the android app 9.If Single,

Double and Triple seat Patti switch is detected then display message on LED display also on androidapp. Also switch off the DC motor and switch ON relay

10.Go to step 4

### III. HARDWARE COMPONENTS USED

#### 1. IR Sensor

The IR Sensor Module or infrared (IR) sensor is a basic and most popular sensor in electronics. It is used in wireless technology like remote controlling functions and detection of surrounding objects/ obstacles. IR sensors mainly consist of an Infrared(IR) LED and a Photodiode, this pair is generally called IR pair. An IR LED is a special purpose LED, it is can emitting infrared rays ranging from 700 nm to 1 mm wavelength. These types of rays are invisible to our eyes. In contrast, a photodiode or IR Receiver LED detects the infrared rays.

#### 2. Tilt Sensor

A tilt sensor is an instrument that is used for measuring the tilt in multiple axes of a reference plane. Tilt sensors measure the tilting position with reference to gravity and are used in numerous applications. They enable the easy detection of orientation or inclination. Similar to mercury switches, they may also be known as tilt switches or rolling ball sensors. These instruments have become gradually more popular and are being adapted for increasing numbers of high end applications. For example, the sensor provides valuable information about both the vertical and horizontal inclination of a bike which helps the rider to understand how to tackle obstacles during the ride. By knowing the current orientation of the plane, and the angle at which the plane is inclined to the road surface.

#### 3. Micro roller Sensor

Micro switch definition is: It is a small and very sensitive switch that activates by using minimum physical force is known as a micro switch or miniature snap action switch. This is one kind of momentary contact switch which is widely used as a sensor in industrial, medical instruments & automotive. The switches are frequently used in switch panels & home appliances with small buttons. These switches are normally economical & they can work for a long time. These switches can be used as safety devices because they are sensitive and reliable.

### IV. ADVANTAGES

1. The sensor has excellent sensitivity combined with a quick response time: Highly durable piezo- resistive pressure sensors with excellent repeatability and fast response were developed. The developed sensor have a characteristic of coated with silicone rubber, which has widened pressure measurement range and improved response time.
2. Low power consumption. it is of paramount importance to choose components that improve the power system performance within the constraints of the project's current budget. One way to do this is to utilise power saving techniques on top of your low-power components.
3. Cost is less
4. Low maintenance
5. Onetime Investment
6. Easy Wearable and comfortable
7. The system is more compact
8. Provides a user-friendly interface hence will have a greater acceptance by the technologically unskilled workers

Result

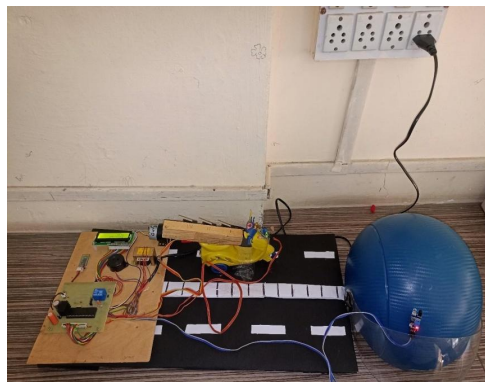


Fig 5: Result

**VIII: CONCLUSION**

System should be able to detect the triple seat and gives the notification accordingly. In accordance with that system should be able to detect the inclination of vehicle with respect to road.

**REFERENCES**

- [1]. "Simultaneous Measurement of Tilt Angle and Temperature With Pendulum-Based Fiber Bragg Grating Sensor," by R. Yang, H. Bao, S. Zhang, K. Ni, Y. Zheng and X. Dong in IEEE Sensors Journal, vol. 15, no. 11, pp. 6381-6384, Nov. 2015. doi: 10.1109/JSEN.2015.2458894
- [2]. "Detection and classification of passenger seat occupancy using stereovision, by M. Devy, A. Giralt and A. Marin-Hernandez " Proceedings of the IEEE Intelligent Vehicles Symposium 2000 (Cat. No.00TH8511), Dearborn, MI, USA, 2000, pp. 714-719. doi: 10.1109/IVS.2000.898433
- [3]. "Seat Occupancy Detection Based on Capacitive Sensing," by B. George, H. Zangl, T. Bretterkieber and G. Brasseur in IEEE Transactions on Instrumentation and Measurement, vol. 58, no. 5, pp. 1487-1494, May 2009. doi: 10.1109/TIM.2009.2009411
- [4]. "A Combined Inductive–Capacitive Proximity Sensor for Seat Occupancy Detection," by B. George, H. Zangl, T. Bretterkieber and G. Brasseur in IEEE Transactions on Instrumentation and Measurement, vol. 59, no. 5, pp. 1463-1470, May 2010. doi: 10.1109/TIM.2010.2040910
- [5]. "Sensing Tilt With MEMS Accelerometers," by S. Luczak, W. Oleksiuk and M. Bodnicki in IEEE Sensors Journal, vol. 6, no. 6, pp. 1669-1675, Dec. 2006. doi: 10.1109/JSEN.2006.881433