Speed Control using Helmet with Emergency Overtaking

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Abstract— According our research or collected information the project on smart helmet the system works on the principle of starting of the bike by recognising helmet that rider wears. Sometimes rider not able to wear helmet or the system failure will occur in that condition he will not start his bike. So, we are going to change it into helmet based speed control. This system consisting of helmet interconnected with the rider vehicles with using RF transmitter and receiver module. Depending over the helmet recognition speed limit will automatically provide to the rider using speed limiting kit which will ranges from 0 to 40 km/hr. according to safe transportation rules. Sometimes, rider forgot to carry helmet with himself in this period he will ride with limited speed and also there may be problem of overtaking occurs due to traffic congestion. In accordance with these problem obstacles behind the rider and it will sensed by ultrasonic sensor and provides rider full speed access to overtake front obstacles.

Key words: RF Transmitter Receiver Module, LCD Module, Hall Sensor, Arduino Uno, Ultrasonic Sensor

I. INTRODUCTION

High speed of vehicles has been identified as a major risk factor for road injuries, these results into severe injuries related to head. As we can see in our day to day life accidents are happens due to two major reasons 1) Excess speed and 2) Road safety rules. Excess speed is defined as exceeding the speed limit. Inappropriate speed is defined as driving at a speed not suitable for the prevailing road and traffic conditions. Excess and inappropriate speed is responsible for a maximum proportion of the mortality and morbidity that result from road crashes. In big cities and countries, speed contributes to about 20% to 40% of deaths on the road, while in some medium size countries, speed is estimated to be the main contributory factor in about half of all road crash controlling vehicle speed can prevent crashes happening and can reduce the impact when they do occur, lessening the severity of injuries sustained by the victims.

According to experts number of deaths occurs due to wearing helmets and could be more as the available data might not have captured all the details entirety. According to the data, the total number of road deaths was increased as compared to 2015. Road safety rule involves driving vehicle in proper manner, within speed limit provide according to traffic authorities. Not following traffic rules and not wearing helmet .etc. All these reasons lead to accidents.

A. Methodology

Our project consist of two phases
1) Regular Riding Phase
2) Emergency Riding Phase

1) Regular Riding Phase

Riding phase consists of helmet interlocked by using transmitter and receiver module with bike and bike will start. When the rider wear the helmet the bike will accelerate with full speed that will be provided by the bike manufacturer. So it will provide safety while riding.

2) Emergency Riding Phase

This riding phase consist of riding without helmet. Sometimes, due to some reasons rider forget helmet to carry with him. This will creates the problem in starting of bike to overcome this problem. We are providing the rider emergency speed limit ranges between 0 to 40 km/hr. So, he can bring his helmet and reach his destination with regular speed.

3) Emergency Riding

These phase consist of one major part that will helpful to him while overtaking the front vehicles depending on back side vehicles or provide them a side to overtake our vehicle called as overtaking speed.

Overtaking speed is the speed same as that of regular speed of the bike without any limit for particular time. The overtaking speed provided to the rider depending on behind vehicles (i.e. vehicles should be present on riders back side. Speed will provided to take an appropriate decision by the rider whether to overtake or to overtake the vehicle present behind himself.
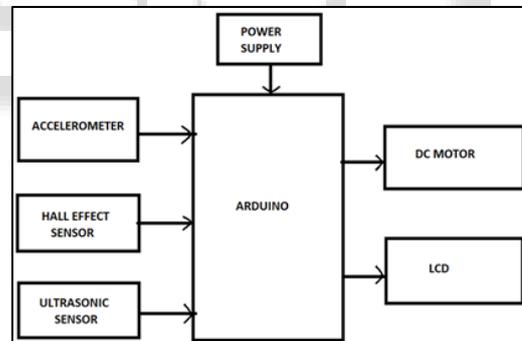
II. BLOCK DIAGRAM

Fig. 1:

A. Flowchart

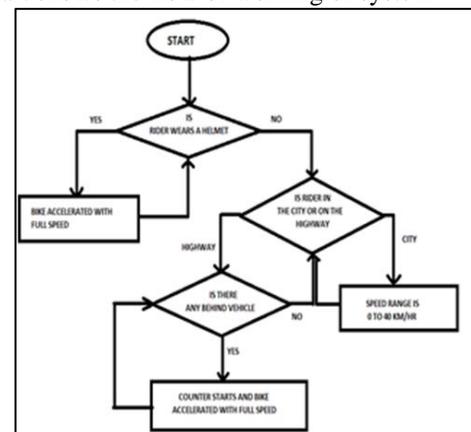Flowchart shows the flow of working of system

Fig. 2: Flowchart

1) Hall Effect Sensor

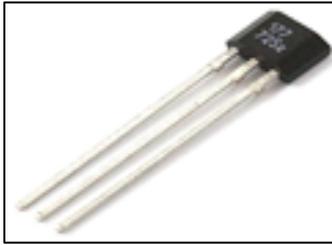Hall Effect sensor is use for measuring the speed of motor.

Fig. 3: Hall Sensor

2) Ultrasonic Sensor

This sensor is used for the detection of vehicle behind the rider in the absence of helmet for full speed control. This is the 4 pin module having transmitter and receiver.

Fig. 4: Ultrasonic Sensor

3) Power Supply Unit

The system needs regulated power supply which provides appropriate voltages for proper working of its blocks. This unit is specially designed to gives out all necessary voltage levels required for working of all blocks.

4) LCD Module

This is a output device connected to output port of arduino and displays related massages depending on different condition and depends upon the zone in which vehicle enters.

5) Transmitter Receiver Module

This RF module consist of an RF Transmitter and an RF Receiver. The transmitter/receiver (Tx/Rx) pair operates at a frequency range of 434 MHz. An RF transmitter transmits serial data wirelessly through RF through its antenna. The transmission occurs at the rate of 1Kbps - 10Kbps.The transmitted data is then received by an RF receiver operating at the same frequency as that of the transmitter.

6) Arduino Uno

This hardware module has software module inherited in its memory and which scans continuously its input port pins for HIGH signal. When Receiver gets any HIGH signal then it generates its relative output i.e for helmet detection full speed control is provided and if helmet is undetected then high signal for ultrasonic sensor provides full control for short duration. +5V is the high signal input to arduino from sensors. This is necessary because chip accepts TTL compatible signals [i.e., LOW = 0 V and HIGH = exact +5 V] at its input port. After receiving any HIGH signal at its input port, software module identifies the zone by HIGH input pin number and accordingly generates the message and control signal to output port. The alert message is sent to output port where LCD Module is connected for display purpose.
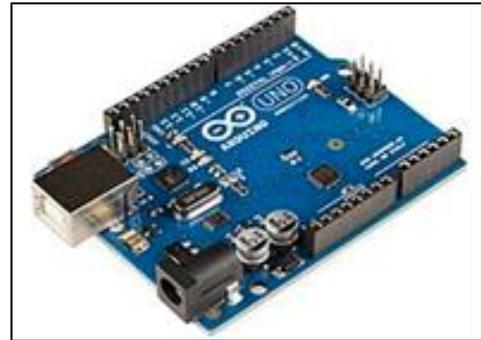

Fig. 5: Arduino Uno

III. RESULT

1) When helmet is not wears by the rider then speed limit on highway is 0 to 40 km/hr.

2) When helmet is not wears by rider and behind vehicle is detected the counter starts and provide full speed acceleration.

3) When helmet is wears by rider then bike will accelerated with full speed.

4) When helmet is wears by the rider and if he will enters in city zone then speed limit 0 to 40 km/hr.

IV. CONCLUSION

The project is concern with Government Law i.e. compulsion to wear helmet during riding. By using of this system, our approach is to control the speed of vehicle at according to speed limiting condition of road to avoid the accidents. The accidents and rash driving can be reduced up to 75% and can save many lives and many valuable properties. These project presents architecture for automatic adaptation of the speed control of a vehicle for the condition of the road which can help to decrease one of the major causes of fatalities: the excessive or inadequate vehicle speed in terms which provides safety while driving. Our approach is based on a combination of different technologies. The technology developed can helps human drivers in different road circumstances.

V. FUTURE SCOPE

In future if there is a large demand of this type of helmet we can manufacturer the whole circuit in the printed circuit board, so that circuit becomes smaller and easy to fixed into the helmet. The circuit can also be powered by solar energy so that it uses green energy and does not harm environment.

REFERENCES

[1] Smart Helmet, Electronics & comm. Engg. , R.B.SEngg. Technical Campus, bichpuriagra, UP, India, by International Research Journal of Engineering and Technology (IRJET) May-2015e-ISSN: 2395 -0056.

[2] Govind Prasad Arya, Deptt. Of Computer Science and Engineering Shivalik College of Engineering Dehradun, Uttarakhand, International Journal of Computer Science and Information Technologies, Vol. 6 (3), 2015, 2384-2386 (ISSN: 0975-9646).

[3] Saurabhgouthi, Micontroller based Smart Wear for Driver Safety, International Research Journal of Engineering and Technology, e-ISSN: 2319-1163.

[4] Dr.MCET, Pollachi, Speed Reducer for Two Wheelers Using Radio Frequency Sensors, by journal of Research in Mechanical Engineering.

[5] Prof.DHIVYA AVS Engineering College,Smart Helmet System Using Alcohol Detection ForVvehicle Protection,International Journal of Innovative Research in Science Engineering and Technology.

[6] Mr. B. HariKishorRao, Vivekananda Technical University, Chhattisgarh, India, Helmet Based Vehicle's Auto Ignition with Alcohol Detection and Accident Indication and Reporting System, International Journal of Advanced Research in Computer and Communication Engineering ISO 3297:2007 Vol. 5, Issue 8, August 2016