Helmet Integrated Bike: A Cost Efficient Solution for Riders

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Abstract: Street mishaps are expanding in our nation, the majority of them are caused because of carelessness of not wearing the helmet, drink and drive and over speeding which numerous leads to death of serious wounds because of absence of medical treatments given to the harmed individual at perfect time. This influence us to consider making a system which guarantees the security of biker by making it compulsory to wear the helmet by the rider. To prevent head wounds that may lead to quick death prevent drink and drive under the influence situation by testing the breadth of the rider before the ride, prevent over speeding and rash riding by alarming the rider and furthermore to provide proper medical attention. Whenever met with a mishap by advising the concerned individual with the area location details.

Keywords: Mishap; Helmet Alcohol Sensor; Biker; GSM message

I. INTRODUCTION

Young age inclines toward two-wheeler, or motorcycle more than four-wheeler. The riders avoid from wearing helmet with no particular explanation. Also, over speeding furthermore, drink and drive have become basic issues. Due to the absence of experience or focus and trespass of traffic rules, which prompts mishaps. In this way , with the help of innovation we made sure that traffic rules are followed, issues referenced above the maintained a strategic distance from and their effects are minimized. The thought of building up this work originates from our social duty towards society. In numerous mishaps that happen, there is a tremendous loss of life. Numerous individuals die on streets consistently that happen because of bike mishaps. There are different purposes behind mishaps for example, not having satisfactory capacity to drive, blemished two wheelers, rash driving , drink and drive, and so forth. Be that as it may, the main reason was the not wearing the helmet on the individual which leads to quick death because of cerebrum harm. Consequently, it is significant that there should be a facility to limit the after impacts of these mishaps. In any case, the fundamental objective of our work is to make it compulsory for the rider to wear a helmet during the ride, to prevent drink and drive under the influence situation and over speeding or rash riding by motorcyclists and furthermore give proper medical attention when met with mishap by alarming the concerned individual which will give solutions for other significant issues for mishaps.

II. PROPOSED SYSTEM

This paper depicts the model of helmet utilizing IOT, which guarantees the wellbeing and security of the bicycle rider. Here the framework is liable for the accompanying functionalities.

- The framework won't permit the rider to begin the vehicle, if the rider isn't wearing the protective helmet.

- It identifies the utilization of liquor, if the rider has expended liquor, the bicycle motor won't start.

- The framework cautions the rider when the speed surpasses the constrained worth.

- The unique mark authorization, gives security what's more, forestalls vehicle burglary.

- When met with a mishap it identifies it and gives the warning to the enrolled contact with a area and picture data

- Accelerometer will measure the angle and record the values based on co-ordinate process and sends the signal to the microcontroller.

III. LITERATURE SURVEY

In this paper author describes that the microcontroller in the system controls the functionality of relay and thus the ignition. This system also identifies the bike accident at any place and alerts the concerned person about the accident. [1]

In this paper author describes that the DPDT electromagnetic relay is placed in the helmet for the ignition of the bike, when the rider wears the helmet therefore there is a time lag in switching on of the circuit and wearing the helmet. [2]

Instead of using microcontroller board in this project we are using raspberry pie at the receiver end [3].

According to [7], "the smart helmet was implemented by placing vibrations sensor in different places of helmet

where the probability of hitting is more which are connected to arguing board".

In this paper the author describes about the inbuilt accelerometers in mobile phones to recognize accidents and the inbuilt connectivity features of smartphones for accident notification. This system is not accurate and reliable as smartphones are vulnerable and experience a great deal of abrupt when speed changes and alert the person with the false notification. [6]

IV. IMPLEMENTATION

The usage of this framework gives an exceptionally modest and effective discovery. Notice is given utilizing the android application which is constrained by an administrator module.
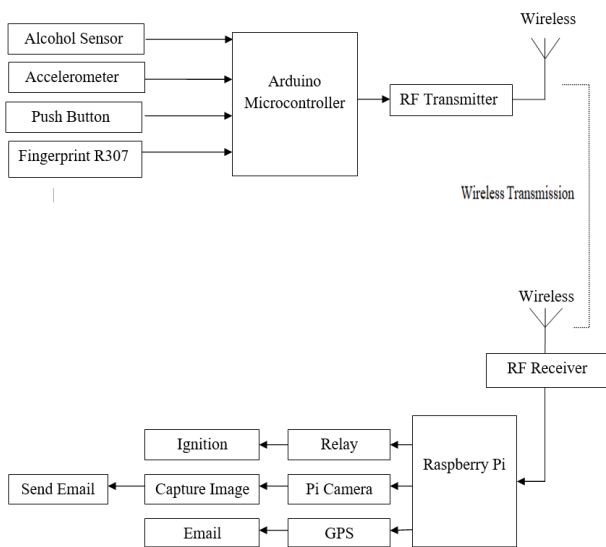

Fig 1.   Architecture of helmet integrated bike

A. Helmet section

At the point when the rider has worn the helmet, the press button is pushed. Alcohol sensor gauges the nearness of liquor in rider's breath. Accelerometer measures inclining of the helmet. The yield of these parts will go about as contribution for microcontroller which is on the head protector.

The microcontroller forms the information and sends it to the bike segment utilizing RF transmitter.

B. Bike section

RF beneficiary gets the information and the information is transmitted to the microcontroller. Microcontroller settles on the choice as indicated by the yield of the helmet section.

There are three conditions to begin the bike:

• Push button should be pressed when a rider wears the helmet.

• Rider ought not to be alcoholic.

• Fingerprint must match the rider fingerprint.

At the point when the yield of the helmet section coordinates these three conditions, at that point the bike will begin. On the off chance that the rider surpasses the edge speed, at that point the rider will get the alarm message to hinder the speed.

The client needs to check his fingerprint on the module and the master fingerprint is relegated. Number of client's fingerprints could be put away in the memory of module which can be accepted as the slave. So as to begin a vehicle, the approved rider must output his fingerprint on the sensor and put on the helmet over his head, and if the fingerprint matches with the put away information, a "FINGERPRINT MATCHED READY TO START" message is shown over 16x2 LCD display. On the off chance that the Fingerprint doesn't matches with the put away information, the microcontroller pins are reset to zero volt, and LCD shows "Unique mark DOSEN'T MATCH UNABLE TO START" and afterward a message displays "TRY AGAIN"

At the point when an accelerometer quantifies the inclining of helmet regarding ground as zero, it implies that an ACCIDENT has happened. [3] Immediately Accident notification will be sends to the enlisted contact number utilizing GSM through "ACCIASSISTO" Application. The message can be aborted if the client believes the accident is not major and if it's not the case the pie camera which will be in bike module captures the picture and sends to the registered contact and the registered contact gets the image along with the location

Then they can provide the immediate medical requirement and they can also inform about the incident to the police station. If the accident is minor then the rider can abort the accident notification to the registered number

V. SYSTEM DESIGN

A. Alcohol sensor

Fig 2.   Alcohol sensor (MQ-3)

It is a gas sensor which recognizes the nearness of liquor content gas focus from 0.05 mg/L to 10 mg/L. it is a high touchy to liquor and a minimal effort semiconductor sensor which gives quick reaction and gives both advanced and simple output.
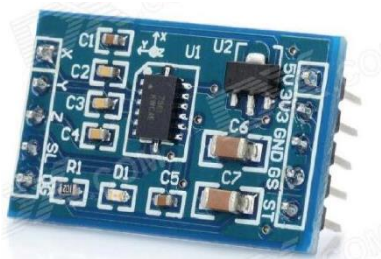
B. Accelerometer

Fig 3.   Accelerometer (MMA7361)

An accelerometer is used to measure acceleration of the object to which this integrated circuit is attached. In this paper, we used the accelerometer for mishap detection. This was done by identifying the tilting of the helmet with respect to the ground.

C. Relay

Fig 4.   Relay module

A relay is a switch which is operated electrically. Along with a set of input terminals for multiple or a single control signal, it contains a set of operating contact terminals as well. The relay may have several contacts like "break contacts", "make contacts", or similar combinations.

D. Pi camera

Fig 5.   Pi camera

The Pi camera module is basically a mobile phone camera module. It uses a rolling shutter to capture images. Instead of reading all pixels of an image at once, the camera reads pixels row-wise when it needs to take a picture.

E. ESP01

The ESP8266 ESP-01 is a Wi-Fi module. It allows microcontrollers accessibility to a Wi-Fi network. This module is a self-reliant System-on-Chip (SOC) and hence does not always require a microcontroller to manipulate outputs and inputs unlike its Arduino counterpart.
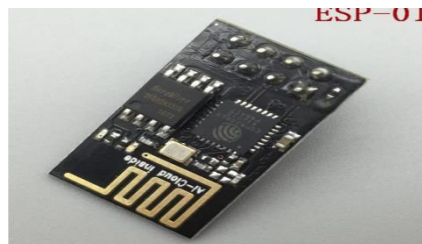

Fig 6.   ESP01 (ESP8266)

F. Raspberry Pi

Fig 7.   Raspberry Pi 3 model B

Raspberry Pi is the name of a series of single-board computers made by the Raspberry Pi Foundation. The Raspberry Pi launched in 2012 The original Pi had a single-core 700MHz CPU and just 256MB RAM, and the latest model has a quad-core 1.4GHz CPU with 1GB RAM, On-board 802.11n Wi-Fi , Bluetooth and USB boot capabilities, it also provides a set of GPIO (general purpose input/output) pins that allow you to control electronic components for physical computing.

G. LCD

Fig 8.   LCD display

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has 2 registers, namely command and data.

H. Fingerprint Module R307

R307 Fingerprint module is fingerprint sensor with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 /adapter. The user can store the fingerprint data in the module and can configure it in 1:1 or 1: N mode for identifying the person.

Fig 9.   Fingerprint module (R307)

VI. RESULT AND CONCLUSION

Severities of accidents are usually increased due to the absence of helmet or by the consumption of alcoholic drinks. The framework additionally contains a strategy to guarantee that the rider wears his helmet without which the vehicle would not begin. The push button installed at the top of the helmet transmits the signal to the microcontroller to the helmet that is worn by the rider, if the signal from the push button is not received by the bike section the ignition of engine of the bike will not turn on.

The results show that the system was able to detect the accident and could send the current location of the rider to the concerned person along with image. The accident is detected based on the value of the inclined helmet.

The presence of alcohol in the breath of a rider is sensed by the alcohol sensor. In case alcohol is detected, the ignition of the bike will not turn on. Out of 300, 275 times the system detects the presence of alcohol.

The vehicle based on biometric identification guarantees the vehicle security and solves the problem of carrying or losing the keys.

REFERENCES

[1] S. Chandran, S. Chandrashekhar, E. Elizabeth N, "Konnect: An Internet of Things (IoT) based Smart Helmet for Accident Detection and Notification", India Conference (INDICON), 2016 IEEE Annual.

[2] R Prudhvi Raj, Ch. Sri Krishna Kanth, A. Bhargav Adityaand K. Bharath,"Smart-tec Helmet," AEEE, India

[3] Pranjali Ingalepatil, Priyanka Barhate, Bhagyashri Nemade, Vijay D Chaudhari "Alcohol Detection System in Vehicle Using Ardino" [International research journal of engineering and technology (IRJET) Volume:04, Issue:06, June-2017]

[4] Jennifer William, Kaustubh Padwal, Nexon Samuel, Akshay Bawkar, Smita Rukhande,"Intelligent Helmet", International Journal of Scientific & Engineering Research, Vol.2, Issue 3, March 2016.

[5] Professor Chitte P.P., Salunke Akshay S., Thorat Aniruddha, N Bhosale, "Smart Helmet & Intelligent Bike System", International Research Journal of Engineering and Technology (IRJET) Vol.03, Issue: 05, May-2016.

[6] S. Hari Sankar, K. Jayadev, B. Suraj, P. Aparna, "A comprehensive solution to road traffic accident detection and ambulance management", International Conference on Advances in Electrical, Electronic and Systems Engineering (ICAEES), 2016.

[7] V.Krishna Chaitanya, K.Praveen Kumar, "Smart helmet using arduino", Hyderabad, 2013.