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ijirset@gmail.com

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Smart Helmet Management System Using IOT

Dr.P.Srinivas Kumar¹, D.Gopi krishna², Ch.Pavan Kumar³, B.Nitesh varmaa⁴, Ch.Bhargav sai⁵

Associate Professor, Department of CSE, KKR & KSR Institute of Technology and Sciences, A.P, India¹

B.Tech Student, Department of CSE, KKR & KSR Institute of Technology and Sciences, A.P, India²

B.Tech Student, Department of CSE, KKR & KSR Institute of Technology and Sciences, A.P, India³

B.Tech Student, Department of CSE, KKR & KSR Institute of Technology and Sciences, A.P, India⁴

B.Tech Student, Department of CSE, KKR & KSR Institute of Technology and Sciences, A.P, India⁵

ABSTRACT: Smart helmet is a special idea which makes motorcycle driving safer than before. It is a way to stop Starting of vehicle without wearing helmet or even if the driver is boozed. In addition, it has a great feature of detecting accidents and informs specific people via SMS with location, thus aiding ambulance to reach the correct location. We want to implement all the sensors within the helmet, which will send the information to the module connected with the bike engine wirelessly. The designed Smart helmet guarantees the protection of the rider by way of making it essential to put on helmet, and also ensures that the rider hasn't consumed alcohol extra than the permissible limit. If any of those top protection guidelines are violated, the proposed machine will prevent the biker from starting the motorcycle. The system additionally allows in green dealing with of the aftermath of accidents through sending a SMS with the location of the biker to the police station. This ensures that the victims get proper and activate medical interest, if he/she met with an accident.

KEYWORDS: Smart helmet, IoT, SMS, Vehicle, sensor.

I. INTRODUCTION

Traffic accidents are one of the main causes of death and disability, with motorcyclists representing the great majority of both the victims and the perpetrators. Motorcyclists are about 26 times more likely to die in a crash than someone riding in a passenger car, and are 5 times as likely to be injured. In motorcycle accident people primarily die because of not wearing helmet. Correct helmet use can lead to a 42% reduction in the risk of fatal injuries and a 69% reduction in the risk of head injuries according to the WHO.

Another reason death occurs by not receiving medical treatment on time. In India nearly 40% of the people can't get medical treatment in accidents which lead to high increase in death rates. Drunk driving causes more than 10,000 deaths every year, about 1/3 of all traffic-related deaths. In a recent year, more than 230 children were killed in drunk-driving crashes, the NHTSA reports. Drinking and driving costs more than \$44 billion in deaths and damages annually. At first the Helmet Unit initializes all of the ports and establishes the connections with the Bike Unit Then the clever helmet assessments the studying of FSR sensor to ensure that the rider wears the helmet properly. If the condition is not appropriate i.e, the rider does not put on helmet, then the helmet unit sent the Negative sign to the bike unit by way of RF transmitter to not allow the rider to begin the motorbike engine by means of locking the flasher relay. At first the Bike Unit initializes all the ports and establishes the connections with the Helmet Unit. The rider must connect the system with net to enable the Emergency Ambulance Service with the aid of connecting the motorcycle unit with Google Firebase Server. Then microcontroller analyses the acquired signal received with the aid of RF Receiver and make sure that the rider wears helmet properly. Then the machine permits the rider to begin the engine by using unblocking the flasher relay. After beginning the engine, the microcontroller continually analyses the obtained actual-time sign dispatched by way of helmet unit to make certain that the rider wears helmet properly at the time of using. If the rider met any twist of fate, then bike unit will sense the condition via the Gyro sensor and Accelerometer reading.

II. LITERATURE REVIEW

[1] International Journal of Science and Research (IJSR) ISSN (Online): 2319 7064 - Volume 3 Issue 3, March 2014 K. Sudarsan , P. Kumaraguru4 : This system ensures that the bike will not start unless the driver does not wear the helmet and has not consumed alcohol. This system alerts the bike rider if any obstacle comes to rear part of bike. [2]International Journal of Electrical and Electronics Research ISSN 2348-6988 (online) Vol. 2, Issue 4, Oct 2014



Manjesh N, Prof. Sudarshan Raj :If the bike will tilt than the threshold value will consider that the accident occurred and through the GSM & GPS the message will be send to the family member or ambulance with location. But Limitation of this project is, If tilting of helmet is done more than threshold level even if accident is not occurred then message will send which is inconvenient.

[3]International Journal of Science and Research (IJSR) ISSN 2319 – 2518 Vol. 4, No. 2, April 2015 © Manasi Penta 2015: Helmet checking using motion detector sense. [4] Ajay, G. Vishnu proposed a work on the system for intelligent helmet. This system detects the accident and notifies it through the GPS and GSM system. For accident detection pressure sensors are used. The GPS is used to track the current location. This location is sent to the emergency contacts through GPS. GPS is also used for navigation system which provides the direction of location. This is done by connecting Google maps and the voice readout which is exhibited through speakers in helmet so the Google voice will give the person the easy and the most possible route to reach the location. So, the features like location tracking and accident notification are very useful. [5] Karthik P, Muthu Kumar proposed a system in which a different way of accident detection and notification is used. It consists of two parts helmet part and vehicle part. And they both are interacting with each other using radio frequencies. Piezoelectric sensor is used for accident detection. According to the output the signal is sent from helmet side to the vehicle side and then appropriate actions will be taken. For emergency message, GSM module is used.

[6] Sreenithy Chandran, Sneha Chandrasekar, Edna Elizabeth N proposed the work on smart helmet which makes use of Wi-Fi enabled processor and IoT. It provides the features of accident identification and notification by making use of accelerometer sensor and cloud computing. It needs the good internet connection for the system to work properly. This system has a provision to avoid the wrong triggering of accident. This is done by putting a timer of few seconds within which the message sending can be prompted. [7] Muthiah M1, Aswin Natesh V2 proposed work to create a prototype model that would help riders improves their vision and road safety. Intelligent control of the headlights using the servomotors used here becomes active when conditions such as the correct tension of the helmet belt are fulfilled, which, in turn, satisfies the next appearance in the receiver circuit, which causes the motorcycle to start working. Thus, the driver may not be allowed to ride without a suitable helmet. Additional features provided by this system improving user safety, for example, built-in sleep sensors, monitoring drivers and sirens, reducing the risk of falling asleep.

III. EXISTING SYSTEM

The existing project basically has a wireless telecommunication and is connected to a smart phone. This prototype uses sensors to detect a crash or accidents and the communication hardware is used to automatically dial a predefined emergency contact. The other existing system is to control the speed in which the biker is going in. The helmet is fixed with all the components and sensors that read the speed of the bike and accordingly instruct the rider to reduce or increase the speed based on the obstacles ahead the bike. A biker's helmet is a protective headgear used by the biker, which protects the rider's head from impact during accident. Speeding and not wearing the helmet are the main reasons for injuries. The chances of the injuries will be more if rider does not wear the helmet. The helmet provides ventilation system and protects rider's head from injuries.

If accident occurs it becomes necessary to inform the ambulance for treatment but only few people get the ambulance service at right time and at right place but few people don't get service at all. There are number of rules by the government of India for safety of the bikers. To check whether the traffic rules are followed by the bikers or not there is a traffic police but rules are not followed strongly in India so automatic system is required which ensures that some rules are followed. To solve these problems we are going to implement intelligent bike ignition system with smart helmet which automatically checks whether the rider has worn helmet or not, if the person has worn the helmet then bike will start otherwise bike will not start. In case of any accident throughout the journey a message having location of accident will automatically sends to the family member that is predefined number and also to the ambulance with the help of inbuilt GSM and GPS module.

IV. PROPOSED SYSTEM

The project consists of 4 parts:

- (i) **Helmet Authentication:** To ensure that the bike rider is wearing a helmet or not (using IR & PIR Sensor).
- (ii) **Alcohol Detection:** To ensure that the bike rider has not consumed alcohol (using MQ3 Gas Sensor).
- (iii) **Accident Detection:** It Detects the accident by measuring the impact force using Force Sensor by calculating the impact force its detects the accident.

(iv) **Response System:** in the helmet in case of accident, to inform bike rider's family about the accident using GPS & GSM module.

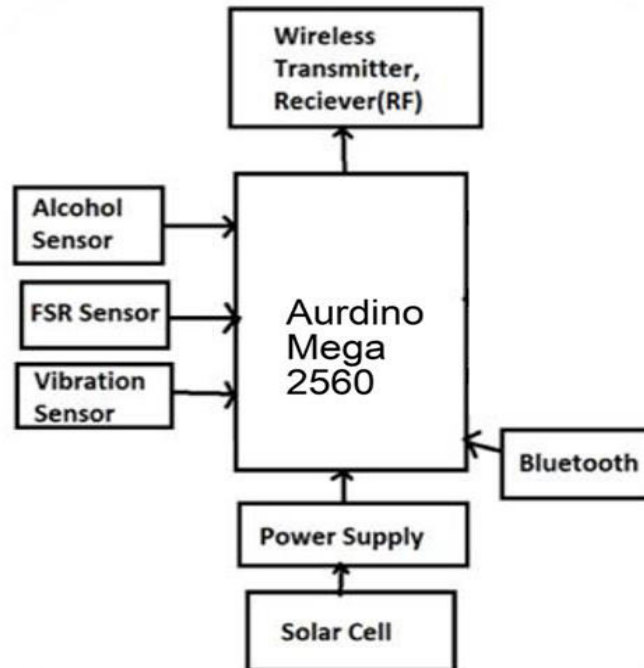


Fig: Propose System Architecture

To use the helmet he or she must give some details on the registration page to send sms in case of emergency.

The smart helmet system mainly consists of

Helmet Module: At first the Helmet Unit initializes all the ports and establishes the connections with the Bike Unit. Then the smart helmet checks the reading of FSR sensor to ensure that the rider wears the helmet properly. If the condition is not appropriate i.e., the rider does not wear helmet, then the helmet unit sent the Negative signal to the bike unit by RF transmitter to not allow the rider to start the bike engine by locking the flasher relay.

Bike Module: At first the Bike Unit initializes all the ports and establishes the connections with the Helmet Unit. The rider should connect the system with internet to enable the Emergency Ambulance Service by connecting the bike unit with Google Firebase Server. Then microcontroller analyses the received signal received by RF Receiver and make sure that the rider wears helmet properly. Then the system allows the rider to start the engine by unblocking the flasher relay. After starting the engine, the microcontroller always analyses the received real-time signal sent by helmet unit to make sure that the rider wears helmet properly at the time of riding. If the rider met any accident, then bike unit will sense the condition through the Gyro sensor and Accelerometer reading.

Communication module: WIFI (Wireless Fidelity) WIFI provides network connectivity by using radio waves. A wireless adapter is used establish a connection to create hotspots and the wireless router. It is a world popular wireless networking technology uses radio wave to provide high speed internet and network connection and based on IEEE 802.11.

Finding nearest hospital: By using google Map API we can find the nearest hospital in your location. We give the co-ordinates of your location the API will display the neatrest hospital location

Sending information to emergency care & family members: The Information will be send to the ambulance & family members using wifi Communication module. The information vary to the ambulance & family members



V.SAMPLE OUTPUT SCREENS

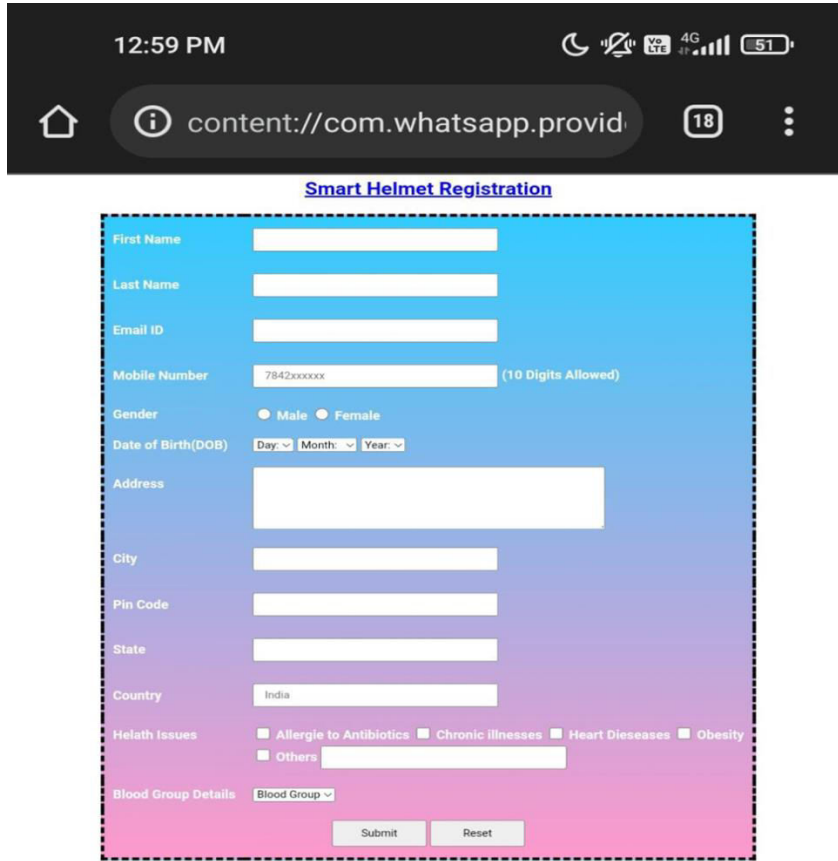


Fig 1: Registration page

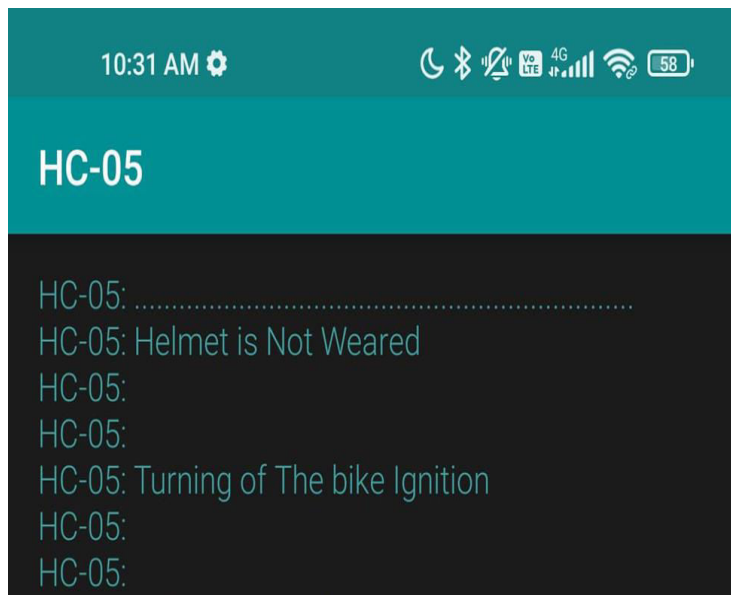


Fig 2: If helmet not weared

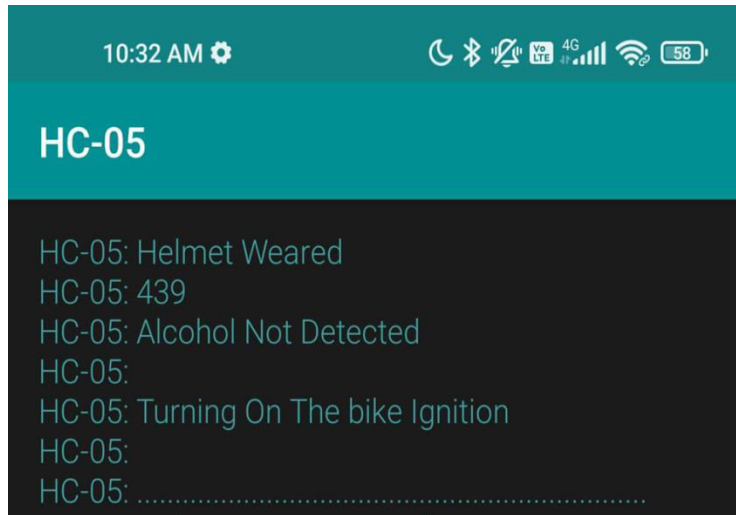


Fig 3: If helmet wearing

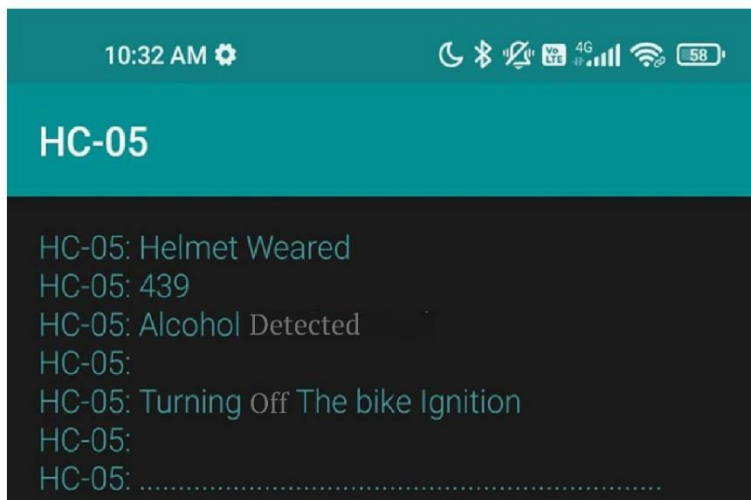


Fig 4: If a person drinks alcohol



Fig 5: If any accident occurs



VI. CONCLUSION & ENHANCEMENT

The designed Smart helmet ensures the safety of the rider by making it necessary to wear helmet, and also ensures that the rider hasn't consumed alcohol more than the permissible limit. If any of these prime safety rules are violated, the proposed system will prevent the biker from starting the bike. The system also helps in efficient handling of the aftermath of accidents by sending a SMS with the location of the biker to the police station. This ensures that the victims get proper and prompt medical attention, if he/she met with an accident.

In future we want add the following features Like, user account for user that displays the following content (i)Average speed (ii) Distance travel (iii) how the user driving the bike like rudly or safe, In Built voice assistant & speakers, speed limit for the bike, Integrate with google maps for navigation and reporting about the traffic.

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