International Journal of Innovative Research in Engineering
Volume 4, Issue 3 (May-June 2023), PP: 24-27.
www.theijire.com ***ISSN No: 2582-8746***

Smart Helmet for Accident Rescue and Theft Avoidance

S.Vijayakumar[1], Kanishkar M[2], Mukilan R[3], Nagamani D[4]
[1]*Associate professor, Department of Electronics and Communication Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India.*
[2,3,4]*UG Students, Department of Electronics and Communication Engineering, Paavai Engineering College, Namakkal, Tamilnadu, India.*

How to cite this paper:
S.Vijayakumar[1], Kanishkar M[2], Mukilan R[3], Nagamani D[4], "Smart Helmet For Accident Rescue And Theft Avoidance", IJIRE-V4I03-24-27.

https://www.doi.org/10.59256/ijire.2023040250

Abstract: *The impact when a motor cyclist involves in a high-speed accident without wearing a helmet is very dangerous and can cause fatality. Wearing a helmet can reduce shock from the impact and may save a life. There are many countries enforcing a regulation that requires the motor cycle's rider to wear a helmet when riding on their motorcycle, Malaysia is an example. A smart helmet is a special idea which makes motor cycle driving safer than before. This is implemented using GPRS(IOT)and GPS technology. GPS data using the GPS module that is interfaced to it. The working of this smart helmet is very simple, vibration sensor and alcohol sensor placed in different places of helmet When the data exceeds minimum stress limit then GPRS module automatically sends message to ambulance or family members. It also has an alcohol detector sensor which detects whether the person is drunk and switches off the engine if the sensor output is high. Vehicle access only authorized person using Iris image using MATLAB. Unknown persons access to indicate the alarm and turn off vehicle.*

Key Word: *Vibration Sensor, Alcohol Sensor, GPS, GPRS, Buzzer, Microcontroller*

I.INTRODUCTION

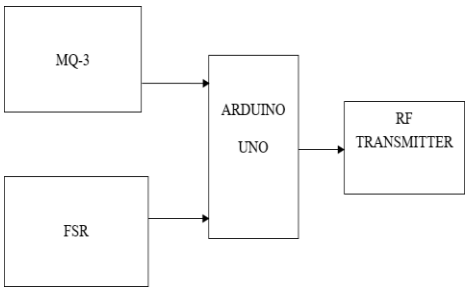
Now a day's most of the countries are enforcing their citizens to wear helmet while riding bike and not tor idea bike when the person is under the influence of alcohol, but still rules are being violated. The motivation of this project comes from the real-world challenges that we face daily on the roads. Road accidents are on the rise day by day and in countries like India where bikes are moreprevalentmanypeopledietocarelessnesscarriedinwearinghelmets.Inpresentdayscenarioweencounter numerous cases of death due to two- wheeler road accidents. Despite of the fact that helmets are available very where, people are not wearing them. In the event of road accidents, the message is sent to the emergency contact through IOT. Accidents. The objectives of this project are to design the circuit that can improve safety of motor cyclists, to develop a smart safety helmet for complete rider.

As the bikers in our country are increasing, the road mishaps are also increasing day by day, due to which many deaths occur, most of them are caused due to most common negligence of not wearing helmets, also many deaths occur due to lack of prompt medical attention needed by the injured person. The project aims at the security and safety of the bikers against road.

II. EXISTINGSYSTEM

The existing system based on RF based communication and it will detect the range of traffic the driver wears a helmet or not. The manual key is pressed and to detect the drunken and drive. Our project ensures that the driver has worn the helmet and at the same times/he is not drunk. For this we are using Arduino and RF module for programming and for wireless transmission.

Existing Block Diagram



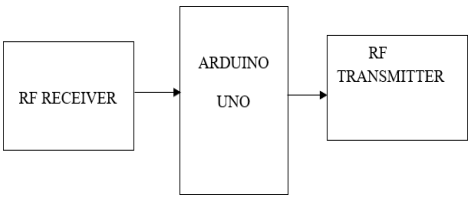


Figure1:Block Diagram

III.PROPOSED SYSTEM

The working of this smart helmet is very simple, vibration sensors are placed in different places of helmet where the probability of hitting is more which are connected to micro controller board. So, when the rider crashes and the helmet hit the ground, the sesensors sense and gives to the microcontroller board, then controller extract GPS data using the GPS module that is interfaced to it. When the data exceeds minimum stress limit then GPRS module automatically sends message to ambulance or family members. It also has an alcohol detector sensor which detects whether the person is drunk and switches off the engine if the sensor output is high. In this way are project is helpful society to save human life to travel a vehicle with safety. Vehicle access only authorized person using Iris image using MATLAB. Unknown persons access to indicate the alarm and turn OFF vehicle.

IV.PROBLEM STATEMENT BLOCK DIAGRAM

A) Helmet Unit

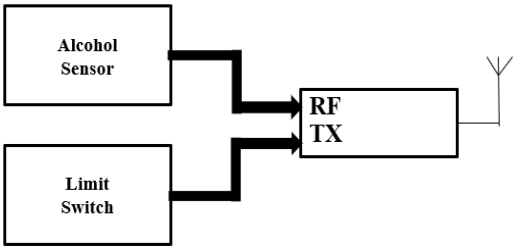


Figure 2:Helmet unit

B) Bike Unit

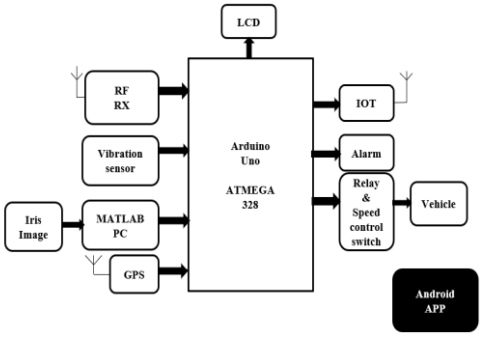


Figure 3: Bike unit

V.HARDWARE USED

- Arduino Uno
- LCD display
- Vibration Sensor
- Alcohol Sensor
- GPS
- GPRS Modem
- Relay
- Speed control

1. Arduino Uno

Arduino/Genuino Uno is a microcontroller board based on ATmega328P. It features 14 digital I/O pins (6 of which can be used as PWM outputs), 6 analog inputs, a 16MHz crystal, a USB connector, a power jack, an ICSP header and a reset button.

Figure 4: Arduino board

2. LCD Display

Figure 4.3 LCD display with Reading

A liquid crystal display (LCD) is a thin, flat electronic visual display that takes advantage of the light modulating properties of liquid crystals (LC). LCs do not emit light directly. They are used in a variety of applications including computer monitors, televisions, dashboards, airplane cockpit displays, signage and more.

3. Vibration Sensor

A piezoeectric sensor is a device that uses the piezoelectric effect to measure pressure, acceleration, strain, or force by converting them to an electrical signal.

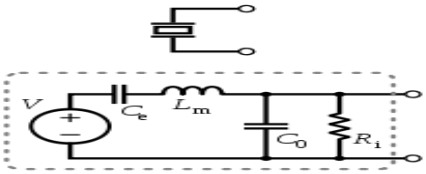


Figure 4.5 Piezoelectric Sensor

4. Alcohol Sensor

Blood alcohol content (BAC), also called blood alcohol concentration, blood ethanol concentration, or blood alcohol level is most used as a metric of alcohol intoxication for legal or medical purposes. Blood alcohol content is usually expressed as a percentage of alcohol (generally in the sense of ethanol) in the blood.

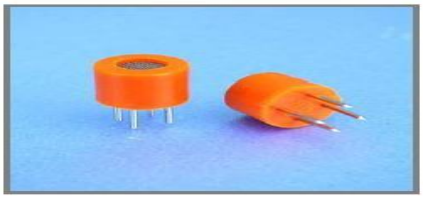


Figure 4:Alcohol Sensor

5. GPS Antenna

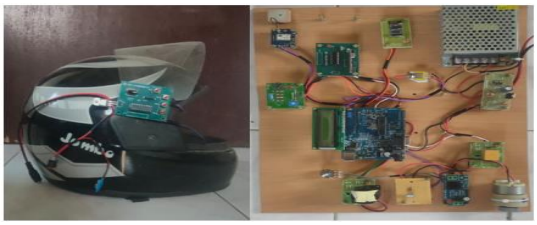
We're interested in designing, building, and testing a GPS antenna that would be implemented on the body or inside of a vehicle. This antenna would be different than others on the market in that it would not only utilize the L1 frequency (1575.42 MHz), but also the L5 frequency (1176.45 MHz) to be introduced in the future. Our goal is to also make it interoperable with the European counterpart to GPS, Galileo which uses 1164–1214 MHz and 1563–1591 MHz bands.

6. GPRS

General Packet Radio Service (GPRS) is a packet oriented mobile data service on the 2G and 3G cellular communication system's global system for mobile communications (GSM). General packet radio service (GPRS) is a packet-based wireless data communication service designed to replace the current circuit-switched services available on the second-generation global system for mobile communications (GSM) and time division multiple access (TDMA) IS-136 networks.

VI.RESULT AND DISCUSSION

This intelligent system has many of the greatest advantages. Here we can access all the controls from the mobile app, so we added all kinds of sensors to protect the driver, this system will be more reliable, cheaper, cheaper to maintain and easier to use. This design is very useful for all bikes; can effectively be incorporated into a smart vehicle.



VII. CONCLUSION AND FETURE ENHANCEMENT

We have therefore developed a smart helmet to identify alcoholics and drivers. Effective life-saving methods were used in this project. The main feature of this project is to detect the scene of the accident and send it through an IOT server of a nearby hospital. Most accidents are caused by drunk driving and driving. Even a normal person has an accident, the number of fatalities increases because he is not wearing a helmet. Even if normal people are affected by this drunk driver of the vehicle. Next, for security reasons, we'll add an iris detector that detects the user's iris. If an unauthorized person attempts to operate the vehicle while wearing a helmet, an authentication message will be sent to the registered mobile phone number. If the user grants access, the engine will start and the bike will keep running, otherwise the engine will stop. This technology is added for security reasons and to prevent theft in our environment. That's why we developed this project. In this way, our project helps society to save lives to travel safely with vehicles.

VIII.FUTURE ENCHANCEMENT

IRIS scanner can be added directly without using a PC. This device can be integrated into vehicle.

References

1. *Shabina.S"SmartHelmetUsingRFandTechnologyforUndergroundMinesSafety"InternationalConferenceonIntelligentComputingApplications,2014.*
2. *K. Vidhya, M. Kasi selvanathan "Smart Helmet andBikeSystem"InternationaJournalofRecentTechnologyandEngineering (IJRTE) ISSN 2277-3878, Volume-7Issue-4S2,December 2018.*
3. *PingLi,RamyMeziane,MartinJ.D. Otis, HassanEzzaidi, "A Smart Safety Helmet using IMU and EEGsensors for worker fatigue detection" 978-1-4799-4926-7/14/$31.002014 IEEE,2014.*
4. *P.Dharani,T.Ganesh,V.Gopinath,Y.SharmasthVali"SmartSafetyHelmetforBikeRidersusingIoT"International Research Journal of Multidisciplinary Tech novation,Published online30 July2020.*
5. *Nikahat Fatimaa, Trisha Khandelwal and Hardik H.Thakkar,"ImplementationofSmartSafetyModelforTwo-Wheeler Drivers Using Embedded System" 2250-0138(Online),IndianJ.Sci. Res.14 486-490, 2017.*
6. *Nikahat Fatimaa, Trisha Khandelwal and Hardik H. Thakkar, "Implementation of Smart Safety Model for Two-Wheeler Drivers Using Embedded System" 2250-0138 (Online), Indian J. Sci. Res. 14 486-490, 2017.*
7. *P. Dharani, T. Ganesh, V. Gopinath, Y. Sharmasth Vali "Smart Safety Helmet for Bike Riders using IoT" International Research Journal of Multidisciplinary Tech novation, Published online 30 July 2020.*
8. *Ping Li, Ramy Meziane, Martin J.D. Otis, Hassan Ezzaidi, "A Smart Safety Helmet using IMU and EEG sensors for worker fatigue detection" 978-1-4799-4926-7/14/$31.00 2014 IEEE, 2014.*
9. *Shabina.S "Smart Helmet Using RF and WSN Technology for Underground Mines Safety" International Conference on Intelligent Computing Applications, 2014.*
10. *Sharda Mungale, Lakhan Talreja, Akshay Choudhari, Rahul Rode "Safety Helmet for Mine Workers using RF Technology" International Journal of Engineering Science and Computing, Volume 7 Issue No.3, March 2017.*