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Smart Helmet with Driver Monitoring System using Arduino

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A B S T R A C T

This project deals with the monitoring and tracking the motorcycle and driver parameter using sensors and uploading to an IOT platform along with its Gps location. During the driving IOT enable and sensors provides continuous monitoring reading related to alcohol, location, wearing helmet and sleeping. The impact of road accidents can lead to the loss of many lives and can also damage many body parts. s. This situation becomes more serious if the riders won't wear the helmet which can be prevented by wearing the helmet and can reduce these impacts. While riding the bike, the government made it a mandatory rule to wear the helmet. Using this rule as a base, a smart helmet system is proposed which helps in providing safety to the riders and prevents accidents. In this project hardware components or sensors act as input and actuator act as output, software is real time algorithm

***Keywords*:**Arduino,,Helmet,,HCSRO4,RF,Tx Rx, Alcohol detection sensor, LCD display, Eye blink sensor.

1. Introduction

India has a huge number of road accidents every year. The accidents may be due to many reasons like by drink and drive, driving rashly ., exceeding the speed limit, etc. Sometimes, the person who gets injured might not be responsible for the accident. It might be the fault of some other vehicle rider . But overall both riders will get affected. Due to a lack of first aid and emergency medical services on time, the riders may die. Some deaths are due to the ambulance not reaching the desired location on time. In case of an accident, to save time and inform the concerned person, a system is proposed which can make sure that the rider gets the required attention in a short time. In India, many people use two-wheeler vehicles as compared to four-wheeler vehicles because of its low cost and simplicity. In many accidents, the rider gets injured mainly on the head. A helmet plays a very important role in saving the life of the rider. So to encourage people to wear helmets and to avoid accidents, a design is proposed that synchronizes the module present in the bike with the module present on the helmet. If a rider is not wearing the helmet and starts the bike, it won't start. The rider must wear the helmet to start the bike. The rider when wears a helmet, the module present in the bike synchronizes with the module present on the helmet. There is an MQ-3 (alcohol) sensor that is placed near the bike rider's mouth. If the MQ-3 sensor senses the alcohol content in the rider breath then the bike won't start. After clearing the tests of wearing the helmet and the alcohol sensor test, the bike can start. If the rider meets an accident then the vibration sensor sends a signal to the processor present on the helmet module.

2. Literature Review

1. There are many previous works done in the field to enhance the helmet for the safety of the rider. Pranjal Hazarika has worked on providing a safety helmet for the coal mine workers. This helmet was provided with a carbon monoxide sensor and a methane gas sensor. The sensor data is transmitted via X-Bee in wireless mode to the control room. Behr C J et al. proposed design for the three basic works with the helmet; detecting any collisions, any person removing the helmet during the work, and checking the air quality. This design was used for mining industry workers.

2. Rashmi V et al. proposed a design for a helmet that detects whether the rider is drunk or not and the speed limit goes also taken care of by sending a message using the GSM module to the registered mobile number after crossing the speed limit. Nataraja N et al. proposed a design for the helmet. This helmet has a module that synchronizes with the bike module for ensuring whether the helmet is worn by the rider or not. If the helmet is not worn by the rider then the bike won't start. It has a module for accident avoidance detection. Shikha Gupta et al. proposed a design for the helmet using collision and alcohol sensors for the detection of the collisions and sensing the alcohol presence from the mouth of the rider. Jesudoss A et al. proposed a helmet design for accidental avoidance. In case of accident avoidance, the GSM module sends a message to the nearby hospitals for getting the help for the riders in a short time. Divyasudha N et al. has designed and analyzed the smart helmet. This design monitors and informs the riders regarding the heavy trucks and buses present near him. Sarika K et al. have proposed design for the helmet with a wiper interfaced with it. The wiper will get activated when the sensor senses the rain or moisture in the air or a water drop falls on the sensor. By keeping all the previous designs,

a new design is proposed which implements all the existing features with a try of reducing the power consumption by making the circuit as consolidated as possible

3. Idea and Methodology:

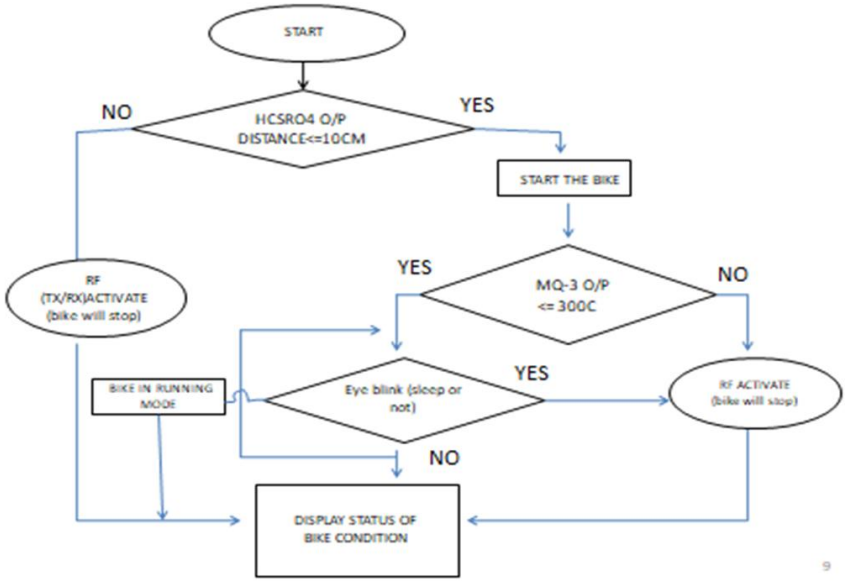
The proposed smart helmet with river monitoring system is depicted in the above figure. This device is used in the Arduino board as the main processing circuit because we are interested in specific alcohol & eye blink. We designed our system for measuring the person wearing helmet or not respiratory by using sensor to determine the emotion state of the subject. When the participants wear the equipment by the different sensors, we are able to display the related values of a participants to monitor the device we are using embedded as a main language it can be implemented in threee stages.

4. SOFTWARE USED :

EMBEDDED C:

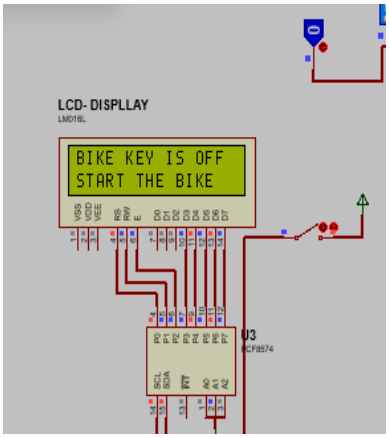
In order to address the issues of commonality amongst C extensions for various embedded devices, the C Standards Committee developed Embedded C as a set of language extensions for the C programming language. Embedded C programming frequently requires nonstandard extensions to the C language in order to perform more sophisticated microprocessor features like fixed-point arithmetic, numerous distinct memory banks, and core I/O operations. The C Standards Committee defined a unified standard that all implementations must adhere to in a Technical Report, which was most recently updated in 2008[1] and reviewed in 2013[2]. It provides a number of capabilities that are not available in normal C, including named address spaces, fixed-point math, and basic I/O hardware addressing. Embedded C mostly uses the syntax and semantics of normal C.

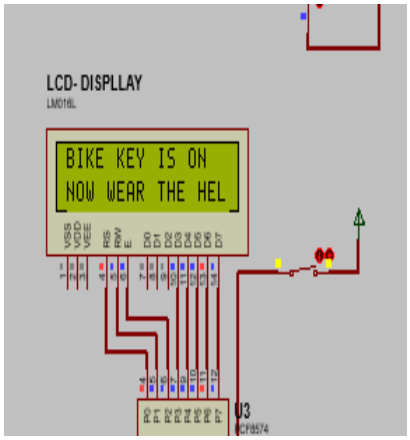
OVER ALL DESIGN:

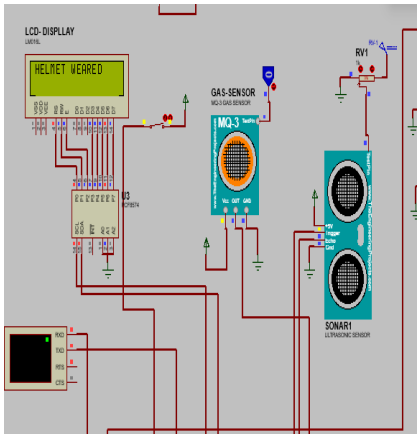


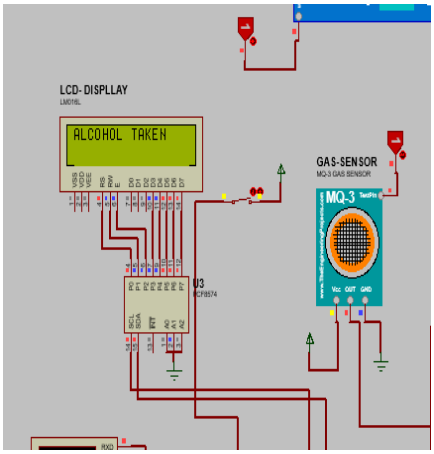
Outputs and Results:

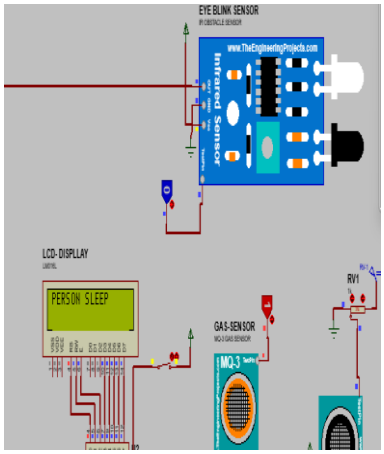
The primary microcontroller and Aurdino serve as the input and are connected to the wearable sensors. The final outcomes include increased respiration, heart rate, GSR, temperature, and other parameters.











5. Conclusion

The helmet has the intended system installed. The proposed solution will increase the efficiency of two-wheeler riding in any season. By using a breath analyzer that is mounted close to the bottom of the helmet, the device detects alcohol consumption. The rider's location is relayed to the registered mobile number in the event of an accident. Rainy days are detected by the sensor, and a wiper is activated to remove the raindrops in front of the helmet. You may manually stop the wiper as well. The majority of the advantages that can be provided to rider safety by donning a helmet are covered by the suggested approach. The circuit has a larger area. The size of the prototype's following iteration can still reduced and also making plans to cut electricity usage. The size of the suggested system circuit can yet be decreased. Artificial intelligence (AI) can be used to determine where the helmet is placed on the wearer's head precisely. The bike won't start if the bike module doesn't reply; in such event, the bypass mechanism can be opened with the password. The hospital in the area can receive the accidental message and location. The circuit size decrease for the proposed system. To make the prototype circuit more user-friendly, its size can be decreased. By adding a bigger capacity for a longer time, the battery's power can still be increased..

6. **References**

[1] D. Spector, “Combined safety helmet and PA system, U.S. Patent No. 6,015,160,” 2000.

[2] Parada Rita et al, “Helmet-based navigation notifications,” 2015.

[3] P. M. Kenleigh C. Hobby, Brendan Gowing, “"Smart helmet " US Patent (US 2013/0215281 A1),” 2013. [4] P. Hazarika, “Implementation of smart safety helmet for coal mine workers,” 1st IEEE Int. Conf. Power Electron. Intell. Control Energy Syst. ICPEICES 2016, pp. 1–3, 2017, doi: 10.1109/ICPEICES.2016.7853311. [5] A. K. and G. P. H. C. J. Behr, “A smart helmet for air quality and hazardous event detection for the mining industry,” Int. J. Innov. Technol. Explor. Eng., pp. 2026– 2031, 2016, doi: 10.35940/ijitee.L3947.1081219.

[6] R. Vashisth, S. Gupta, A. Jain, S. Gupta, Sahil, and P. Rana, “Implementation and analysis of smart helmet,” 4th IEEE Int. Conf. Signal Process. Comput. Control. ISPCC 2017, vol. 2017-January, pp. 111–117, 2017, doi: 10.1109/ISPCC.2017.8269660.

[7] N. Nataraja, K. S. Mamatha, Keshavamurthy, and Shivashankar, “Smart Helmet,” 2018 3rd IEEE Int. Conf. Recent Trends Electron. Inf. Commun. Technol. RTEICT 2018 - Proc., pp. 2338–2341, 2018, doi: 10.1109/RTEICT42901.2018.9012338.

[8] S. Gupta, K. Sharma, N. Salvekar, and A. Gajra, “Implementation of Alcohol and Collision Sensors in a Smart Helmet,” 2019 Int. Conf. Nascent Technol. Eng. ICNTE 2019 - Proc., no. Icnte, pp. 1–5, 2019, doi: 10.1109/ICNTE44896.2019.8945979.

[9] A. Jesudoss, R. Vybhavi, and B. Anusha, “Design of smart helmet for accident avoidance,” Proc. 2019 IEEE Int. Conf. Commun. Signal Process. ICCSP 2019, pp. 774–778, 2019, doi: 10.1109/ICCSP.2019.8698000..

[10] S. Kanetkar, A. Rathore, K. Maheshwari, P. Dubey, and A. Saxena, “Smart Helmet Wiper,” 2020 IEEE Int. Students’ Conf. Electr. Electron. Comput. Sci. SCEECS 2020, pp. 6–9, 2020, doi: 10.1109/SCEECS48394.2020.40.