



Smart Helmet

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ABSTRACT

A smart helmet is a type of defensive hat used by the rider which makes bike driving safer than ahead. The main purpose of this helmet is to give safety for the rider. This can be enforced by using advanced features like alcohol discovery, accident identification, position shadowing, use as a hands free device, fall discovery. This makes it not only a smart helmet but also a point of a smart bike. It's mandatory to wear the helmet, without which the ignition switch can not turn ON. An RF Module can be used as wireless link for communication between transmitter and receiver. However, and sends a communication to the registered number with his current position, If the rider is drunk the ignition gets automatically locked. In case of an accident it'll shoot a communication through GSM along with position with the help of GPS module. The distinctive mileage of design is fall discovery; if the rider falls down from the bike it sends a communication.

Keywords: Smart Helmet, IoT, GSM, GPS, Sensors, Accidents Prevention, Alcohol, Message, Bikers.

Introduction

Preface In moment's presto paced life utmost of accidents be due to drinking and driving. Utmost of the countries are forcing the drivers to wear a helmet, still rules are being violated by uncultivated citizens. Therefore the ideal of this design is to make sure people wear helmets and also ride bikes. Another ideal is to make sure the rider isn't drunk. The rider won't be suitable to ride the bike if he's drunk. One further ideal is to reduce the casualty of the accidents by transferring a communication to the riders relative about the accident. This is enforced by using advance features like alcohol discovery, accident identification, position shadowing. It's mandatory to wear helmet, without helmet ignition switch can not ON. The first step is to identify whether the helmet is worn or not. If helmet is worn also ignition will start else it remains off. For this, Force Sensing Sensor(FSR) detector is used. The alternate step is alcohol discovery(2). Alcohol detector is used as breath analyzer which detects the presence of alcohol in rider's breath and if it exceeds admissible limit ignition can not start. It'll shoot communication to the number saying that "Rider is drunk and is trying to ride the bike". MQ-3 detector is used for this purpose. When these two conditions are satisfied also only ignition starts. The third main issue is accident and late medical help. However, he may not admit medical help incontinent, which is one of the main reasons for death, If the rider has met with an accident. Every alternate people die due to detention in medical help, or in the case where the place of accident is unmanned. In fall discovery, we place accelerometer in the bike unit. By this medium accidents can be detected. The end of this design is to make a protection system in a helmet for the safety of bike rider. The smart helmet that's made is fitted with different detectors responsible for discovery(3). There are two main units in this design. Each unit uses a microcontroller. Signal transmission between the helmet unit and bike unit is done using an RF module.

Literature Survey

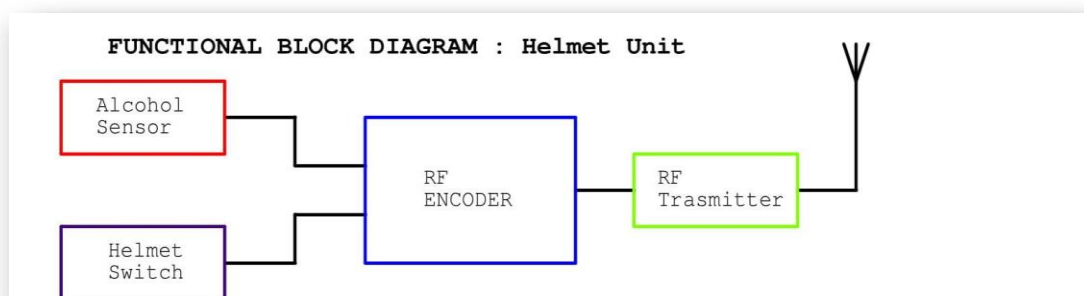
Literature Survey According to the recent exploration paper in 2016 named '2 Helmet using GSM and GPS technology for accident discovery and reporting system', The author especially developed this design to ameliorate the safety of the bikers. The ideal of this design is to study and understand the conception of RF transmitter and RF receiver circuit. The design uses ARM7, GSM and GPS module. The design also uses buzzer for suggestion purpose. Whenever the accident will do also accident spot will be note down and information will shoot out on the registered mobile number.(2) The major disadvantage of this design is they aren't using any display device for showing the current status. Currently utmost of the people's day can not get over without internet. In similar case the bedded bias get connected to the internet which is a platform called internet of effects. The main reason for deaths passing in our country is the road accident, which isn't recovered by the police incontinently. So the near police department should be notified incontinently so that the police prompt them to take to the near sanitarium. In this paper it's easily listed, that one of the main reason for the road accidents is the alcohol consumption of the person. Careless driving of the rider can also be taken as a consideration for the road accident to amend that IR detector is used to descry the obstacles to keep the rider in a safe zone. This paper put forth the result for the safe driving of the rider. the smart helmet consists of breath alcohol sensitizer to know the state of mind and the alcohol consumption of the rider. Suppose if the person is harkening to the music using smart mp3 player where the sound can be acclimated automatically for the safety preventives of the rider. Wearing helmet is a must during driving. So to notify the people with the automatic SMS, a relay should be connected along with the receiver module where the signal is transmitted from the transmitter of the helmet. MQ3 detector checks whether the person has drunk and having nonalcoholic breathe. Also the switch placed in the helmet powers the helmet and pressures the detector to wear the helmet. The author's idea was precheck the rider for alcohol consumption and also to contend the rider to put on the helmet. The bike would not be started if thesepre-conditions fail. If the person met with the accident with the help of GPS and GSM

module the communication will be transferred to the family members and near hospitals. This paper has easily explained about the discovery, the smart helmet has vibration detector to descry the accident by checking the assumed threshold value, and it automatically sends communication to the cousins and ambulance.

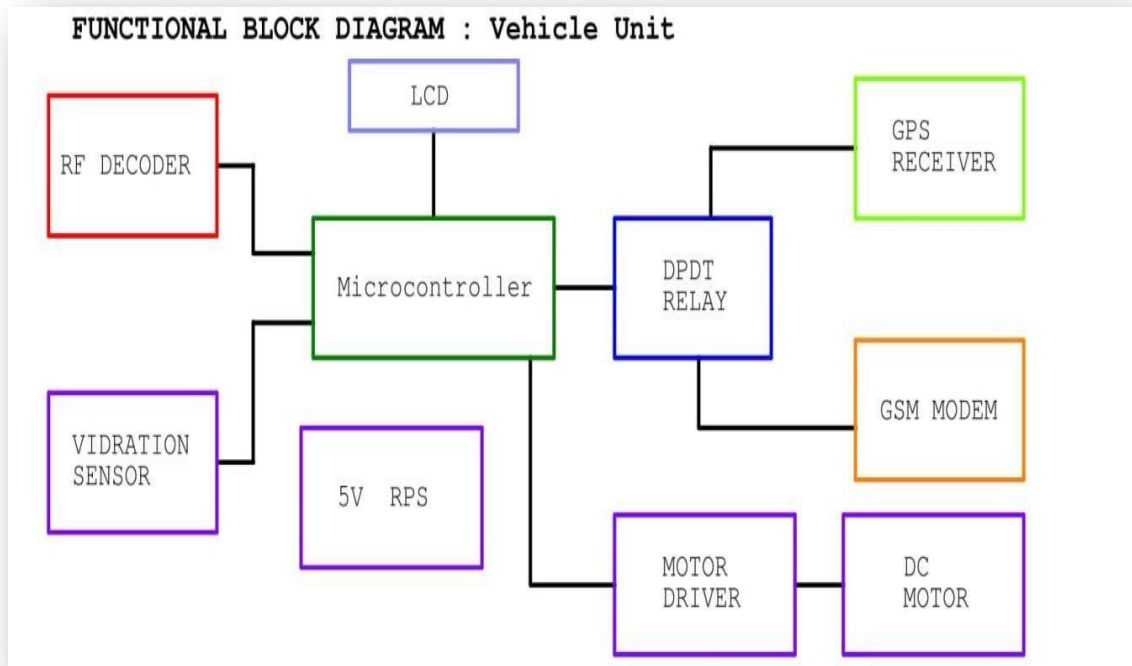
METHODOLOGY

1. When it comes to discussing the methodology for smart helmets, there are several subtopics that can be explored. Here are some subtopics related to the methodology for smart helmets:
 1. **Sensor Integration:** This subtopic focuses on the integration of various sensors within the smart helmet. It includes discussing the selection, placement, and calibration of sensors such as accelerometers, gyroscopes, magnetometers, temperature sensors, heart rate monitors, etc.
 2. **Data Acquisition and Processing:** This subtopic involves the methods and techniques used to acquire and process the data collected by the sensors embedded in the smart helmet. It may include discussions on data sampling rates, filtering techniques, noise reduction algorithms, and data fusion approaches.
 3. **Wireless Communication:** Smart helmets often require wireless communication capabilities to transmit data and receive commands. This subtopic explores the methodologies for establishing reliable wireless connections, selecting appropriate communication protocols, optimizing data transmission rates, and ensuring data security.
 4. **User Interface and Interaction:** The user interface and interaction design of smart helmets play a crucial role in their usability and effectiveness. This subtopic covers the methodology for designing intuitive interfaces, including display screens, audio feedback, voice commands, haptic feedback, and gesture recognition.
 5. **Power Management:** Smart helmets need to efficiently manage power consumption to ensure long-lasting operation and user convenience. This subtopic encompasses methodologies for power optimization, including energy-efficient sensor usage, battery management systems, power-saving modes, and charging mechanisms.
 6. **Algorithm Development:** Smart helmets often require sophisticated algorithms to analyze sensor data and make intelligent decisions. This subtopic involves methodologies for developing algorithms related to accident detection, fall detection, collision avoidance, route guidance, fatigue monitoring, and other safety-related features.
 7. **Testing and Validation:** To ensure the reliability and safety of smart helmets, rigorous testing and validation processes are essential. This subtopic explores methodologies for conducting tests, simulating
 2. real-world scenarios, performing user trials, and evaluating the performance and accuracy of the smart helmet system.
 8. **Human Factors and Ergonomics:** The design of smart helmets should consider human factors and ergonomics to provide comfort and usability. This subtopic discusses methodologies for conducting ergonomic studies, user feedback collection, and incorporating human-centered design principles into the smart helmet's overall methodology.
 9. **Requirement Analysis:**
 - a. Identify the specific requirements and objectives of the Smart Helmet project, considering factors such as accident detection, alcohol sensing, communication, and location tracking.
 - b. Define the desired features, performance criteria, and constraints of the system.
 10. **Component Selection:**
 - c. Select the appropriate components and technologies based on the identified requirements.
 - d. Choose an Arduino microcontroller board with suitable specifications to handle the processing and control tasks.
 - e. Select the GSM module, GPS tracker, alcohol detector, and other necessary sensors based on their compatibility, reliability, and performance.

Block Diagram



Transmitter section



Receiver section

Advantages, operations and future scope

Advantages -

1. Discovery of accident in remote area can be easily detected and medical services handed in short time.
2. It will reduce the probability of accidents by simply avoiding bibulous drive by using alcohol detector.

Operations -

1. It can be designed for lower power consuming safety system.
2. This safety system technology can further be enhanced in bus or other vehicle by replacing the helmet with seat belt.

future Scope -

1. We can apply various bioelectric sensors on the helmet to measure various exertion.
2. We can use small camera for the recording the drivers exertion. It can be used for passing communication from the one vehicle to another vehicle by using wireless transmitter.

Scope of Improvement:

Any system always has a compass for advancements and further advancement. All the systems studied under the literature check have their own different features. All the systems proposed till date are used only for transferring communication in case of accident. There could be such a system where only alcohol discovery is present. Then in this system numerous advanced features are added and also the former features are conjoined in a single system. It'll shoot communication automatically when rider met an accident with helmet on. RF transmitter and receiver are used for starting the two wheeler, if rider not wearing the helmet the bike won't get launch. The alcohol detector will smell the alcohol and it'll lock the igniti on if drunk.

CONCLUSIONS

In conclusion, smart helmets are a promising advancement in helmet technology that offer multitudinous benefits and operations. These helmets incorporate advanced features similar as detectors, communication systems, and data analysis capabilities, furnishing enhanced safety, real-time feedback, and bettered stoner gestures. The crucial conclusions regarding smart helmets are as follows 1. Safety Enhancement Smart helmets integrate features like impact discovery, fall discovery, and collision avoidance systems, contributing to increased safety and potentially reducing the inflexibility of injuries. 2. Real-time Feedback and Alerts Smart helmets give real-time feedback and cautions to druggies, allowing them to cover vital signs, admit announcements, and stay connected while maintaining focus on their conditioning. 3. Connectivity and Communication Smart helmets offer wireless connectivity, enabling flawless communication with other bias and networks, easing data exchange, and access to information. 4. Data Collection and Analysis Smart helmets collect data about the wear and tear and the terrain, which can be anatomized to gain perceptivity into performance, health, or safety criteria, supporting informed decision-timber. 5. Customization and Personalization Smart helmets frequently give customization options, allowing druggies to epitomize their appearance or settings to enhance comfort and satisfaction. 6. Different operations Smart helmets find operations across colorful diligence and conditioning, including cycling, motorcycling, artificial work, sports, service, healthcare, and adventure sports, among others, feeding to specific requirements and challenges in each sphere. While smart helmets offer multitudinous advantages, it's important to consider their limitations, including cost, limited battery life, conservation conditions, sequestration enterprises, and comity issues. As technology continues to evolve, and farther exploration and development are accepted, smart helmets are anticipated to come more advanced, affordable, and extensively espoused, contributing to bettered safety and stoner gestures in a range of fields.

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