

REVIEW ON SMART HELMET USED FOR ACCIDENT SAFETY

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Abstract

The impact when a motorcyclist involved in a high speed accident without wearing a helmet is very dangerous and can cause fatality. Wearing a helmet can reduce the impact shock and can save a life. There are several countries that impose a law requiring the operator of the motorcycle to wear a helmet while riding on their motorcycle, an example being Malaysia. For this purpose, this project is explicitly planned to improve the safety of the rider's motorcycle. If the speed limit is surpassed, motorcyclists are alarmed. A Force Sensing Resistor (FSR) and a BLDC Fan are used to detect the head of the rider and to detect the speed of the motorcycle. Road accidents mostly from bikes are increasing in India day by day, due to not wearing of helmet by bike riders most of the accidents are caused, drink and drive and over speeding which may leads to severe injuries or death due to lack of medical treatments provided to the injured person at right time because they are not in position to make a call to their relative or doctor by sending accurate GPS coordinates.

Keywords: Helmet, Accident, Two wheelers, Sensor, Alcohol, Protection, Safety, GPS system.

1. INTRODUCTION

Increasing in the number of two wheelers. In the event of an accident, lack of timely medical attention to the injured person may lead to death. Thus there is a need for a system which ensures safety of riders by enforcing riders to wear helmets and also assists in providing the rider for medical assistance in the event of an accident. Today's era all talk about the internet of things and how it is changing lives. The internet of things is creating a new world, a quantifiable and measurable world where people and businesses can manage their assets in better informed ways, and can make more timely and better informed decisions about what they want or need to do. This new world brings in many practical improvements such as convenience, health and safety in our lives. Presently in India every four minutes one death occurs due to road accidents. 25-30% road accidents took place by two wheeler Out of total road accidents. According to a recent survey approximately 95.6% of bike drivers died who didn't wear a helmet.



Hence the government has made it compulsory to wear a helmet while bike riding. Riders face many problems on the go such as unable to take calls, unable to see maps for navigation purposes etc. While having these helmets as a safety measure is a boon, we add more features to it to make it smart. A helmet for a motorcycle is a type of protective headgear used by a motorcyclist. The primary objective is protection, which is to protect the head of the rider from the effects of an accident. It protects the head of the rider because the breathing system is provided by the helmet. The key causes for deaths and accidents are speeding and not wearing a helmet. It is established that the number of accidents and deaths increased as the speed of motorcycles increased. This is because of the shock of an impact during the crash. The safety helmet we built is embedded with sensors that serve as detectors for the head of the rider and the security belt itself. Only if the rider buckles his helmet safety belt will the engine of the motorcycle fire. The second safety method we introduced is another sensor that serves as a warning for the rider when the speed of the motorcycle reaches 100 km/h. The indicator is set and flashes to warn the rider of the speed limit [1].

The Internet of Things (IoT), sometimes referred to as the Internet of Objects, will change everything— including ourselves. Every gadget you own, and almost every object you can imagine, will soon be Internet-connected. The Internet of Things (IoT) will bind us in ways, whether it is through your phone, wearable devices or everyday household items. Even users can't picture that yet. In every area of life in which everybody encounters it in one way or the other, IoT has its effect. This paper demonstrates how IoT can be used to turn an ordinary helmet into a "Smart Helmet" that will increase the protection of two wheeler riders. As a result of two wheeler road collisions, there is a concerning rise in morbidity and mortality. In India, it is estimated that one accident takes place every 2 minutes [2]. The occupants and riders of two wheeler vehicles are among the majority to be affected in road accidents. People involved in injuries need to be taken care of and taken to the emergency department immediately. But the treatment of the aftermath of road accidents in the country is lagging. The nearest police station needs to be informed about the incidents immediately so that they can be transported immediately to the hospitals [3].

Reducing the rate of two-wheeler accidents. One of the key reasons for the bike crash is that the rider could have ingested alcohol. The reasons for the accident considered in the paper are listed here. With the support of MQ3 sensor, this paper brings out a solution to reduce the accident due to drunken driving. This system can be combined with the bicycle ignition system, thereby allowing the bike to be powered only by sober people. The MQ3 alcohol sensor is appropriate for detecting the concentration of alcohol in the breath of the rider. It's just like a breathalyzer that is normal. It has a high degree of sensitivity and fast reaction time. Just below the face shield, it can be mounted. Other explanations include the rider's carelessness. Taking this reason into consideration, IR sensors are employed which are used as obstacle detectors. One IR sensor is used on bike modules for safe zone detection. If any obstacle is detected, it



gives a signal to the microcontroller and the microcontroller takes action and gives an alert to the rider.

on road safety in a different perspective with additional features. Baseline that the paper emphasizes is that: most of the time riders hesitate to wear helmets which could result in fatal accidents. The key variables for such road accidents are drink driving and drowsy driving. Some statistics indicate that 35% of injuries are caused by two wheeler accidents and that 60% of the two wheeler accidents are caused by lack of knowledge, drunk driving, and not wearing a helmet. Security is the main concern of all riders. To stop these forms of injuries, a new smart helmet with Brainwave technology has been developed. This helmet alerts the rider if he has a distracted or intoxicated state of mind and therefore prevents accidents and lets the rider drive safely. In the intelligent helmet, the breath alcohol sensitizer helps to recognize BAC and stops them from driving drunk and thereby eliminates injuries.

The Smart MP3 player automatically changes the audio volume as the rider listens to the music as a security measure. The rider can find him or herself using GPS technology and can navigate to the destination. The GSM/GPRS modem sends a message to an individual about the position of the rider in case of accidents. This smart helmet is primarily concerned with the rider's protection and comfort. Since riders normally fail to wear a helmet until they wear it, to start commuting. One tactic that can be used for this reason is pressure to wear the helmet to the bikers as well as an automatic SMS warning in the accidental situation with the biker's exact position. The problem solution is framed. The bike ignition system can only start when the relay is attached, and it could only be possible if the receiver circuit received the signal from the helmet transmitter. It tests if the person is wearing a helmet when driving the vehicle and has non-alcoholic breath. The device is split into two halves: a part of the transmitter and a portion of the receiver. A switch is placed on the helmet that powers the helmet and the pressure sensors are placed to ensure that the helmet is correctly worn on the head. To detect the presence of alcohol, an alcohol sensor MQ3 is mounted near the driver's mouth inside the helmet. If either of the two conditions is breached, the vehicular engine should not be started. The Microcontroller Unit (MCU) controls the relay mechanism and thus the ignition, by means of a relay and a relay interface circuit, controls the engine [4].

It was very obvious that the baseline of the problem being discussed was the same. The idea of the author was to pre-check the rider for alcohol intake and also to insist on putting the helmet on the rider. If these pre-conditions fail, the bike will not start. The author also plots an idea for a post-accident situation, one step forward [5]. Using the GPS and GSM module, a warning message along with the location information will be sent to the family members as well as to the emergency services if an individual is faced with an accident. Smart helmet operation is very simple, vibration sensors are mounted in different helmet places where the likelihood of hitting is more related to the microcontroller board. So these sensors sense and send the microcontroller board when the rider falls and the helmet hits the ground, then the controller extracts GPS information using the GPS module that is attached to it. When the data reaches



the minimum stress level, the GSM module sends messages to ambulances or family members automatically [6].

2. CONCLUSION & DISCUSSION

Various dimensions of smart helmets are discussed briefly in this paper. Smartness of the helmet depends on both, aftermath scenario of an accident and also on the safety of the rider. Out of all the discussed papers, the cost efficient one was with the mobile App as it is less hardware dependent. However, this proposal does have some disadvantage as mentioned above. The rest of the papers are all similar with the same features which might bring a sure change when designed. The IoT system enables the riders to get connected to the Centralized police station and hospital server. The Data of the user is collected in the cloud in any emergency case it can be provided to a person who wants it like relatives, hospital doctors. The main purpose of this research paper is to prove that the motorcycle's engine will only start when the rider wears a helmet. So, it will reduce the chances of motorcycles being stolen and accidents. Micro Controller controls all sensors and the IoT based smart helmet system. Application of the GSM module to transfer signal from IoT based smart helmet to the motorcycle improved the capability of transmitting data.

3. REFERENCES

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