A Review paper on Implementation of Smart helmet

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Abstract - IOT has enabled us to connect our day to day devices in a network for a sole purpose to exchange data. Today a number of countries has made it mandatory to wear helmet while riding. In this paper, I describe a helmet which is made smart using latest IOT technologies. This helmet for the comfort of riders provide various functions such as use navigation services, the load cell detects the weight and judges whether rider is with the pillion or not. Flex sensor will help in detecting helmet wearing position, tilt sensing also detect, alcohol sensor detects the alcohol content. The Smart Helmet system is planned to be a solution for any motorcycle rider that wishes to increase his or her awareness, and safety, while driving. The concept of proximity sensing in automobiles is not a new concept, and has been realized in different projects, and commercial products, before this one. However, such realizations tend to have their own set of advantages and disadvantages associated with them. The design and implementation of the Smart Helmet system seeks to maximize the advantages from similar products, while increasing the safety of rider, pillion rider and also the safety of helmet. What sets the Smart Helmet apart from existing products is the lower cost and ease of use to ensure any rental motorcycle rider can afford and use it.

Key Words: Smart Helmet, IOT, Arduino, Flex Sensor.

1.INTRODUCTION

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. Today in India there is one death every four minutes due to road accidents. Out of total road accidents, 25% accounts for two wheeler accidents. According to recent study 98.6% bikers who died didn't wear a helmet. Hence police department has made it mandatory to wear helmet while riding. Riders face many problems on the go such as 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. Smart Helmet is an innovative way of building a helmet with latest technologies. To make the riders feel more comfortable, we designed a smart helmet. This project is built to aid people to do various task such as navigation, accident detecting and many more while they are driving. This project helps user's to even more wear helmet because of its features in addition to safety purposes. Modern technology has improved the safety features of most regular vehicles, but motorcycles have seemingly not benefitted from the same technological revolution. What motorcyclists need is a solution to safety concerns that all motorists have, while additionally assisting the driver in a few quality of life improvements on the road. This project aims to do just that by giving motorcyclists an easy and effective way of staying aware of the potential dangers lingering outside of their natural field of view. Although not designed to be a complete replacement to manually checking hazards, our device will help in the occurrences where a simple mistake could have led to a fatal outcome.

2. LITERATURE SURVEY

[1]   Edna Elizabeth et al had developed a smart helmet device for detecting and reporting bike accidents. Smart helmet system comprises of various sensors, and it identify the accident by evaluating uneven or irregular variations obtained from sensor system, and a trigger will be sent to Pager Duty from the microcontroller. Pager Duty will then triggers a call to the phone number registered by the motorist. If the driver does not respond to it for a period of 5 minutes after the first call is initiated, then the emergency contacts will be informed with the details about the accident. The emergency contacts will be alerted through text message, e-mail, and phone call until they acknowledge the incident. In real time, this system assures a reliable and quick delivery of information relating to the accident.

[2]   Selvathi et al had designed a system which automatically detects if the rider is wearing a helmet and also checks whether the rider has consumed alcohol before starting the ride. The relay attached to the engine will turn ON if and only if both the conditions are met. The Microcontroller in the system controls the functioning of relay and thus the ignition. This system also identifies the bike accident at any place and alerts the concerned person about the accident.

[3]   Archana D et al had proposed a system which will not allow driver to start the engine without wearing the helmet. When rider wore the helmet, helmet will be locked and engine will be switched ON.

3. PROPOSED SkYSTEM

In this system ESP Controller is used. When the system is switched on, LED will be ON indicating that power is supplied to the circuit**.** The accelerometer is placed in the helmet such that it detects tilts of the helmet. When the rider crashes, the helmet hits the ground and the accelerometer detects the tilt, that are created when the helmet hits the ground and then the microcontroller detect the accident occurrence and it will send information about the accident and location of accident using GPS modules. Alcohol sensor sense the alcoholic content whether the rider drunken or not, if he drunken bike will not start showing as alcohol detected on android app. Use of pressure sensor, senses whether the rider wear the helmet or not. If he not wears the helmet again bike will not start and intimate the rider to wear the helmet. At the time of completion of ride, the system detects the presence of helmet which is to be kept back in the trunk by the rider. If the helmet is not found inside the trunk, the rider will be charged a penalty and the helmet will be considered stolen.
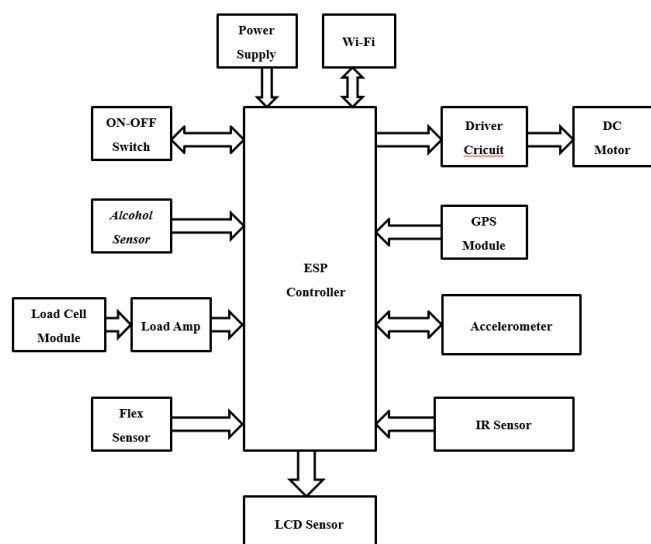
ADVANTAGES:

The system has a longer range of communication since Wi-Fi is not affected by noise. The system will ensure that the motorbike will not start unless the rider is wearing a helmet and has not consumed alcohol. In case if any pillion rider is found, the rider will undergo the same checks. In addition, GSM technology is used to inform the family members in case of an accident. As the system will alert the nearby hospital automatically, so rider's fatality is reduced.

DISADVANTAGES:

The modules should be online every time and the accuracy may not be 100%. The system doesnot gives the updates of the particular system devices, if the device is defective.
The bike will not start unless we wear the helmet. Miss

handling of the helmet may cause unnecessarily message alert.

APPLICATION:

For the application of the smart helmet based on the presented design, it may include several fields such as:
1. Safety to rider
The helmet will ensure the safety of rider and the pillion (if any) by ensuring that they are not drunk. If the rider is sensed to be drunk by the alcohol sensor module, the vehicle's ignition will turn off and the person will not be able to ride the vehicle.
2. Reduce accidents
Due to the presence of tilt sensor inside the helmet, the module will detect accident. In case of any accident, the helmet detects it and by using the GPS and GSM module, it will send message and GPS position to the hospital and emergency contacts.
3. Low cost and less complexity
The sensors used in the model are very cheap and is budget friendly for an average rider.   A very simple mechanism is used for overall operation and is very easy to use.
4. Helmet anti-theft
At the time of completion of ride, the system detects the presence of helmet, which is to be kept back in the trunk by the rider. If the helmet is not found inside the trunk, the rider will be charged a penalty and the helmet will be considered stolen.

4. CONCLUSIONS

The two-wheeler safety system developed with smart helmet and intelligent bike system is reliable and aims to help in the prevention, detection and reporting of accidents hence reducing the probability of the drunk drive cases.The system also ensures that the helmet is placed back in the trunk after the end of ride, ensuring the safety of helmet. It also has several advantages compared to the previous systems.
 Our proposed system gives the primary importance of preventing the accidents and ensures safety for a greater extent in two wheelers. Nowadays, most accident cases occur due to motor bike.   The severities of those accidents are increased because of the absence of helmet or by the usage of alcoholic drinks. By implementing this system, a safe two wheeler journey is possible which would decrease the head injuries throughout accidents caused due to the absence of helmet and additionally reduce the accident rate due to drunken driving.
A GSM module is used in this system that will send a message to the predefined numbers that are programmed using microcontroller in case of any accident. An IR sensor is used so as to ensure the safety of helmet after the end of ride.

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