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# IOT Based Smart Helmet and Accident Detection System

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**ABSTRACT:** In this paper, we have reviewed the recent trends in developing Smart Helmet system. The smart helmet system is used to prevent the accidents in motor bikes and to identify the bike accidents on time for wellness of human being. Also, the smart helmet system analyzed in this paper is used in mining industry for safeguarding the miners from hazardous events in the mine and to alert the miners from hazardous gas emissions inside it. The research also helps to understand the smart helmet system evolved over the period and currently by using emerging technology like Internet of Things (IoT). This work also addresses the intelligent motor bike helmet system which is used to inform the rider about rear big trucks/buses for avoiding collisions.

**KEYWORDS:** Smart Helmet, Internet of Things, and Wi-Fi enabled processor, Support vector machine.

## I. INTRODUCTION

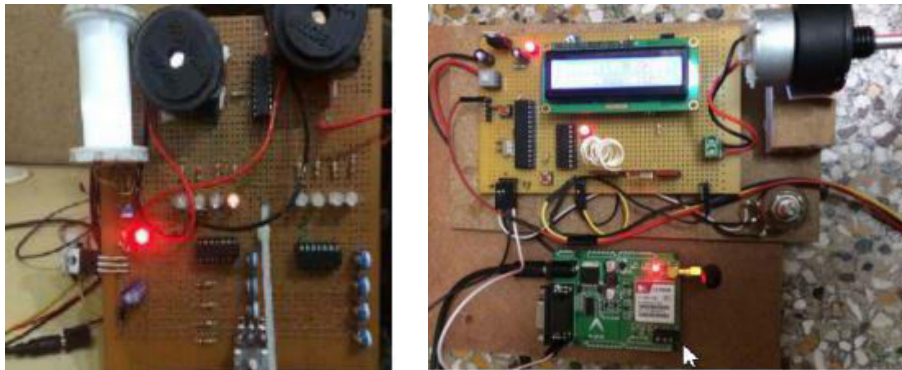
In every aspect of our life safety and security are the major important areas. Now-a-days the scenario that we come across in many cases of human deaths and severe injuries to people is because of two-wheeler road accidents. And it is a crucial issue that requires everybody's attention, for every four minutes there is one death being reported in India. As per World Health Organization (WHO) we have identified that 40% of the deaths and 70% of severe injuries can be reduced if bike rider wears the helmet



Now a day's wearing helmet is compulsory for every two wheeler riders and also it is equally important for pillion riders too to wear the helmet, but the discomfort or inconvenience caused due to wearing conventional helmet makes the rider to avoid using the helmet and finally it leads to death of the rider. In spite of the fact that helmets are being available to everybody, people are just not wearing them and the main reason behind it is that the conventional helmets are generating unconditional temperatures inside it which makes inconvenience to the person.

## II. PROPOSED SYSTEM

IoT based Smart Helmet is a cost effective assistive technology to provide security and safety of the biker against road accidents. The proposed IoT based helmet that prevents road accident and detects alcohol consumption and this will be able to track the biker and sends GPS coordinates periodically to pre-defined number. Also, it detects crash and will be able to send notification to the predefined number and also the nearby police station. This system consists of micro controller, position sensor, Alcohol sensor, piezoelectric sensor, RF Transmitter, IOT Modem, GPS receiver, Power supply. Here we design a system which always checks two conditions before rider starts the ignition of the bike. The first condition is whether the rider wearing a helmet or not and it is detected by position sensor. The second condition is detection of alcohol content in rider's breath with the help of alcohol sensor. Micro controller unit in the helmet collects and process the data by using radio frequency transmitter to the bike section. RF receiver unit in the bike section will receive the data and a relay is placed in the bike section to control the engine ON – OFF. If either of these conditions mentioned above are not met then the bike engine will not start and this will be indicated by a beep sound. If the rider is wearing a helmet and the alcohol content is not detected then ignition of the engine starts. Once Biker starts the bike, during the ride the attached GPS receiver fetches the current (longitude & latitude) location and update it to the pre-defined number with the defined periodicity. If any accident occurs then a piezoelectric sensor detects the crash then an alert message will be sent to predefined number and also to nearby police station using IoT modem.



Bike prototype

## III. LIMITATIONS OF EXISTING SYSTEM

Naturally four wheeler segments incorporated various safety features like ABS, Air bag and automated guidance system over the periods. But in two wheeler segments very little has been done to protect the two wheeler drivers by various manufactures. There were prototypes proposed with more features causing more components to be implanted on the helmet which can lead to add more weight to the helmet and also more cost involved in developing it. There was no discussion on the protection of human head when it exposed to severe accident which results in electronics are being embedded to the human head. There was no prototype available or designed with solar energy as power source to the smart helmet.

## IV. CONCLUSION

Currently we are in the process of finding an appropriate design for the helmet. The proposed helmet should accommodate all the needed facilities in a compact manner. In parallel, the selection of microcontroller and sensors are being taken care. The proposed design will give a solution in terms of cost effective and updated technology front for all kinds of helmets. The aim is to target the two wheelers segment and then bi cycle users with lighter version. This cost effective solution can be integrated with engine start and other needed safety aspects.



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