ISSN (Print) : 2320 – 3765
ISSN (Online): 2278 – 8875

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Website: www.ijareeie.com

Vol. 8, Issue 6, June 2019

Smart Helmet, an intelligent safety for riders using Raspberry Pi and sensors for Drunken drive with GPS tracking

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ABSTRACT: The conventional helmet is used for the safety of driver's head. It does not serve any other purposes in case of any untimely accidents. The major cause for the loss of lives in accidents is due to the delay to reach the hospital. A smart helmet is a special idea which makes motorcycle driving safer than before. This can be implemented using Raspberry Pi, which itself is a PC. Position sensor is placed in the helmet to make it compulsory to wear the helmet without which the engine does not start. Slot sensor is placed which makes it compulsory to buckle the helmet before driving. Alcohol sensor is placed to avoid drunken driving, which notifies if the rider is drunken. We place vibration sensors in different places of helmet where the probability of hitting is more. So when the rider crashes and the helmet hits the ground, the sensors sense and the system extracts the GPS data using the GPS module to identify the location. When the data exceeds minimum stress limit, the GSM module automatically sends message to an emergency number. A navigational display is also set on the wiper screen of the helmet for the smooth driving.

I.INTRODUCTION

In this era of increasing road accidents, a large number of people meet with accidents. Many lives could have been saved if the emergency service could get the crash information in time. As such, efficient automatic accident detection with an automatic notification to the emergency service with the accident location is a prime need to save the precious human life. As a remedy for these problems, we are designing an intelligent system that ensures the safety of biker by making it necessary to wear helmet, as per government guidelines, prevents road accidents to a limit by detecting alcohol consumption and detect crash and can notify quickly the accident to a predefined number. By using this proposed system, it sends an automatic alert message to the authorized person or ambulance in case of an accident or any emergency situations. The alert message body contains the place and time of the consequences to speed up the first aid service to the victim.

II. LITERATURE REVIEW

In today's era, as the bikers in our country are increasing, the road accidents are also increasing day by day, due to which many deaths occur. Road traffic injuries are the leading cause of death among young people aged 15-29 years. Most of the accidents are caused by the negligence in wearing helmet. It is a major issue that needs a special attention, as there is one death reported for every four minutes in India. World Health Organization (WHO) has declared that 40% of the deaths and 70% of severe injuries may be reduced by wearing the helmet. The other reason for accidents is alcohol consumption. Even though breath analysers are used to detect whether the rider has consumed alcohol or not by the traffic department, it is difficult to check each and every rider on the road. If accidents are one issue, lack of treatment in proper time is another reason for deaths. According to survey, nearly half the injured people die due to lack of treatment in proper time. In many situations, the family members or the ambulance and police authority is not informed in time. This results in delaying the help reached to the person suffered due to accident.

III.BLOCK DIAGRAM

Smart Helmet is a cost-effective assistive technology to provide security and safety of the bikers against road accidents. The heart of the project is Raspberry Pi, which itself is a PC. We use Raspbian Stretch as the operating system andPython language for programming. The system comprises of different sensors.

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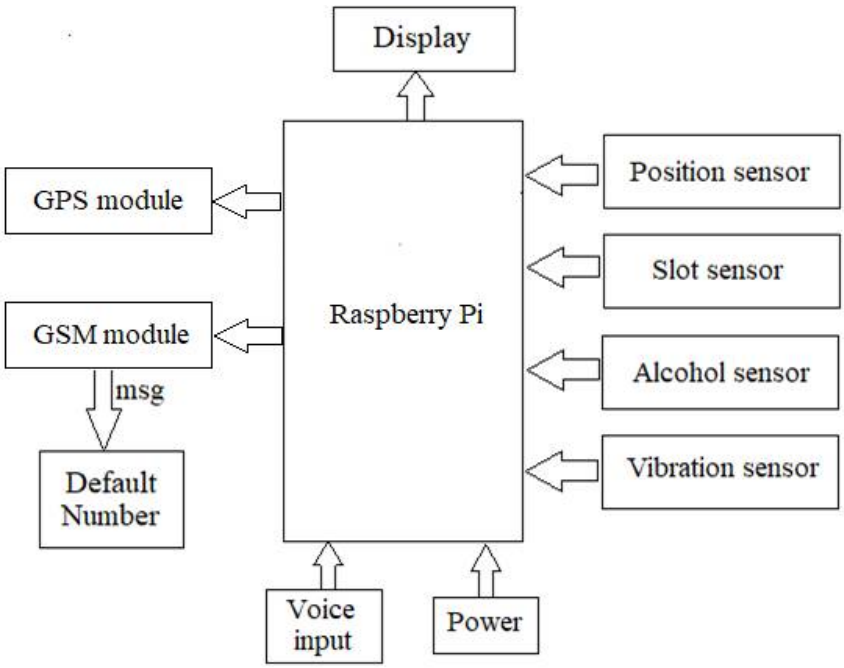

IV. METHODOLOGY

We design the system which checks three conditions before ignition of the engine. It contains a position sensor which make sure that the rider wear the helmet. If the helmet is not placed over the head, it gives a warning message. After checking the placing of the helmet, it checks whether the helmet is properly buckled using a slot sensor. The alcohol sensor makes sure that the rider is not drunken. The engine can be ignited only if all these conditions are satisfied. If any of the three or all the conditions are violated, then the bike will not start. Before beginning the journey, the source and destination places need to be entered through voice input. After determining the destination, proper directions will be provided to the rider for smooth driving. On the way to the destination, if the rider happens to face an accident, the vibration sensor which is a piezoelectric transducer placed inside the helmet senses it. The main idea of the project is to give information about the accident to the ambulance and family members. So the GPS module extracts the location of the spot and the GSM module send the information about the accident and GPS data to the predefined number.

V. RESULT AND DISCUSSION

Smart Helmet is a cost-effective assistive technology to provide security and safety of the bikers against road accidents. On the way to the destination, if the rider happens to face an accident, the vibration sensor which is a piezoelectric transducer placed inside the helmet senses it. The main idea of the project is to give information about the accident to the ambulance and family members. So the GPS module extracts the location of the spot and the GSM module send the information about the accident and GPS data to the predefined number.

VI. CONCLUSION AND FUTURE SCOPE

The main objective of the project is to design a low-cost Smart Helmet. In this era of increasing road accidents, the severities are increased because of the absence of helmet while driving. There is no system available that is capable of identifying alcohol consumption and preventing road accidents. This system is capable of providing security and safety to the bikers against road accidents. The circuit is so designed that the bike won't start without wearing helmet and if the rider is drunken. For effective driving, proper directions are given to the rider with the aid of Google API. In case of any accident, GPS system can globally locate the biker and immediate message will be sent to the family members about the location of accident.

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As an extension to the proposedmodel, it is possible to add the navigation display over the front glass of the helmet itself which makes navigation easier for the rider. Solar cells can be used for the power supply and hence we can conserve the energy. To avoid the heat dissipation inside the helmet, a cooling arrangement can be installed.

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