Smart Helmet for Safe Driving

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Abstract- The high demand of automobiles has also increased the traffic hazards and the road accidents. Life of the people is under high risk. This is because of the lack of best emergency facilities available in our country. An automatic alarm device for vehicle accidents is introduced in this paper. This design is a system which can detect accidents in significantly less time and sends the basic information to first aid centre within a few seconds covering geographical coordinates, the time and angle in which a vehicle accident had occurred. This alert message is sent to the rescue team in a short time, which will help in saving the valuable lives. A Switch is also provided in order to terminate the sending of a message in rare case where there is no casualty, this can save the precious time of the medical rescue team. When the accident occurs the alert message is sent automatically to the rescue team and to the police station. the help of the GPS module. The accident can be detected precisely with the help of both Micro electro mechanical.The Angle of the rolls over of the car can also be known by the message the MEMS sensor. This application provides solution to poor emergency facilities provided to the roads accidents in the most feasible way. The usage of auto mobiles has improved linearly over the past decade,which increased in the risk of human life.

Keywords – Smart helmet,node MCU,vibration sensor,alcohol sensor,IR sensors,connecting devices

I.INTRODUCTION

A smart helmet is a type of protective headgear used by the rider which makes bike driving safer than before. The main purpose of this helmet is to provide safety for the rider. This can be implemented by using advanced features like alcohol detection, accident identification, location tracking, use as a hands free device, fall detection. This makes it not only a smart helmet but also a feature of a smart bike.It is compulsory to wear the helmet, without which the ignition switch cannot turn ON. An RF Module can be used as wireless link for communication between

transmitter and receiver. If the rider is drunk the ignition gets automatically locked, and sends a message to the registered number with his current location. In case of an accident it will send a message through GSM along with location with the help of GPS module. The distinctive utility of project is fall detection; if the rider falls down from the bike it sends a message.The Smart Helmet will be equipped with a Heads-Up Display (HUD) that will communicate with the bike, and show bike information to the rider, so they will never have to look away from the road. The HUD with be mounted to the helmet, by the visor, and will have minimal visibility obstruction. This will allow the rider to see the information without losing sight of the road ahead. The visual display will be bright enough, with high enough contrast, for full daytime visibility

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II.SMART HELMET

A smart helmet is a special idea which makes motorcycle driving safer than before. This is implemented using GSM and GPS technology. The working of this smart helmet is very simple, vibration sensors are placed in places of helmet where the probability of hitting is more which are connected to micro controller

board. So when the rider crashes and the helmet hit the ground, these sensors sense and gives to the micro controller board, then controller extract GPS data using the GPS module that is interfaced to it. When the data exceeds minimum stress limit then GSM module automatically sends message to ambulance or family members. It also has an alcohol detector sensor which detects whether the person is drunk and switches off the engine if the sensor output is high.

III. SYSTEM DESIGN AND IMPLEMENTATION

The existing project basically has a wireless telecommunication and is connected to a smart phone. This prototype uses sensors to detect a crash or accidents and the communication hardware is used to automatically dial a predefined emergency contact.The other existing system is to control the speed in which the biker is going in. The helmet is fixed with all the components and sensors that read the speed of the bike and accordingly instruct the rider to reduce or increase the speed based on the obstacles ahead the bike.This has following disadvantages: Rider does not wear helmet in regions where traffic checking is not done. Testing alcohol content present in blood in each

individual rider in big countries like India is impossible. Difficulty of implementation of traffic rules by traffic police.
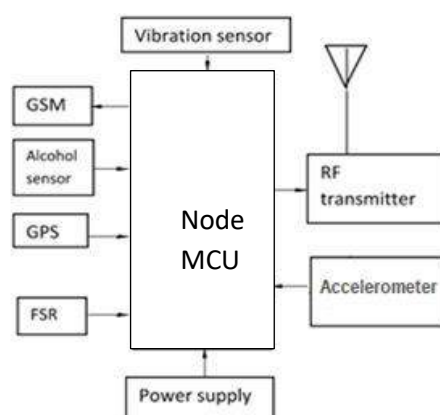
Monitoring system:

In this project we are using accident detection unit which fitted the vibration sensor in the vehicle. For example, In case of accident, occurs if the car is hit to some other vehicle or an object it create some vibration in that case then the vibration sensor will detect the vibrating signal and it pass the message to the arduino. Arduino is used as a Central Processing Unit (CPU) of our project.When the arduino receives a signal from vibration sensor it immediately pass the message to GSM modem then the GSM modem then the GSM modem will starts its process.In this project we used reset button it will be used by the driver if the accident is very normal for example if the driver hit the wall in some situation

like parking then the driver will press the reset button this will inform the arduino to that system will not send SMS. But if the driver is not in a situation to press the switch or if the accident is really a major accident then the driver will not press the reset button and then the system will send SMS.Here, we use GSM modem to send SMS to the family members and the rescue team. Buzzer is also used to indicate as a accident has been occurred which will create a beep sound. Thus the life of a person who met with an accident has been identified and save their life too.

HARDWARE REQUIREMENTS:

- **Node MCU**
- **Vibration sensor,**
- **IR SENSOR,**
- **Vibration sensor**
- **Alcohol sensor MQ-3,**
- **OLED display**
- **Buzzer**
- **Helmet.**

SOFTWARE REQUIREMENTS:

- **ARDUINO IDE,**
- **EMBEDDED C**

The Prototype of this Accident Detection and information passing technique uses the following steps:

1. The Complete Setup is depicted in the form of block diagram.

2. Piezoelectric sensor detects the first occurrence of the accident and it is intimated to the MCU.

3. The Latitude and Longitude are detected using GPS and it is sent as message to the rescue team through GSM.

4. The message receiver number is pre stored in the EEPROM.

5. A OFF Switch is also provided at times of need to avoid false message.

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CONCLUSION

The designed Smart helmet ensures the safety of the rider by making it necessary to wear helmet, and also ensures that the rider hasn't consumed alcohol more than the permissible limit. If any of these prime safety rules are violated, the proposed system will prevent the biker from starting the bike. The system also helps in efficient handling of the aftermath of accidents by sending a SMS with the location of the biker to the police station. This ensures that the victims get proper and prompt

medical attention, if he/she met with an accident.

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