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# Smart Helmet for Accident Prevention using Shortest Path Algorithm

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**Abstract:** Nowadays, the quantity of two wheeler accidents occurring in Asian country due to not carrying the helmet. The key portion of the fatalities occurs as a result of the person was either not wearing the helmet or his/her accident wasn't reportable at right time. The person couldn't be saved due to the delayed admittance to a hospital. By victimization this approach we are able to cut back the quantity of fatalities. Here the person will attend the emergency calls during driving by providing the actual timestamp the speed of the vehicle are going to be mechanically hampered, so the person can attend the call. In this model we tend to victimization, ZigBee device to attach the vehicle's engine and helmet. Impact device is employed to find the shock that occurred throughout the accident. Vibration device as a capability to find the given space and additionally it facilitates to alert somebody to hassle with the system. Flex device is employed to live the number of deflection that occurred within the helmet throughout accident.

**Keywords:** Zigbee sensor, Vibration sensor, Flex sensor, Impact sensor.

## I. INTRODUCTION

Motorcycle associate degreed bikes form an integral part of customized transportation in Asian Country. Statistics says motorbike death accounted for fifteenth of all motorized vehicle crash details in 2015 and were quite double the amount of traveller deaths in 1997. Suppose the helmet is stealing then the helmet can't be connected alternative Zigbee and therefore the notification message are sent to the owner. If any accident has occurred then the notification can be sent to the nearest ambulance and to their family.

The whole work is divided into five different verticals. Android user registration, ZigBee pairing, Sensor synchronization, Auto speed control and Helmet theft detection. In Accident detection and intimation vibration sensor is used.

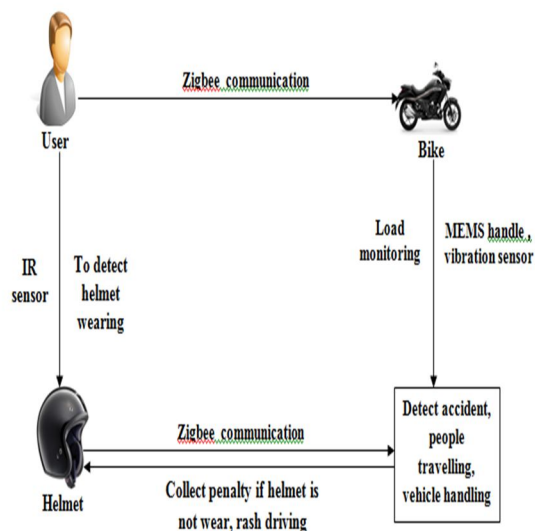
Using Image process technique the information for the traffic control system is obtained. The information contains the data concerning the one who doesn't wear helmet, rash driving, triples and producing high sound horn. Primarily based upon their crime fine amount will be detected from their account and SMS notification will be send to their respective mobile number. This system is capable of providing security and safety to the youth subculture against road accidents. The circuit is thus designed that the bike won't begin while not sporting helmet.

Smart helmet contains of ZigBee detector, Impact detector, flex detector, Vibration detector, RFID tag and measuring instrument. When driving force desires to ride the person should wear the helmet. One of the ZigBee has been connected between the helmet and bike engine. Another ZigBee is connected between the helmet and mobile. Thus, this sensible helmet will be accustomed save millions and numerous lives by serving to them to urge timely medical attention just in case of accidents.

As we are able to see several accidents occurring around us, there's plenty of loss of life. The explanations for the accidents could also be several like no correct driving information, no fitness of the bike, rash driving, drink and drive etc. In some cases the person harmed might not be directly accountable for the accident, it's going to be fault of another rider. If accidents are one issue, lack of treatment in correct time is one more reason for deaths. The harmed folks die due to lack of treatment in correct time.

The explanations for this might once more be several like late arrival of automobile, no one at place of accident to convey data to the automobile. This can be what's running state of affairs in our day to day life, a plan of finding some resolution to the present downside return up with this idea of giving the data concerning accident as presently as doable and in time? Because finally time matters plenty, if everything is completed in time, a minimum of we are able to save, the lives that are lost due to bike accidents. Methodology the concept of this project is to convey data concerning the accident to the automobile and members of the family, therefore here we selected GSM technology to convey the data by causation SMS. For this I take advantage of GPS module to extract the situation of the accident, the GPS knowledge will contain the latitude and meridian values mistreatment that we are able to notice the correct position of the accident place.

Block Diagram For Proposed Model



#### A. Related Works

- 1) Himadri Nath Saha and his team published a paper based on Recent trends in the Internet Of Things(IOT).It provides a short summary on completely different trends of the Internet Of Things and by the synchronization of the internet, wireless sensor, actuators and distributing computing for with success enabling technologies in IOT.
- 2) Mohd Khairul Afiq Mohd Rasil and his team published a paper based on Smart helmet with sensors for accident prevention. While the rider involves during a high speed accident while not wearing a helmet is incredibly dangerous and may cause fatality.
- 3) Srinivasan and his team published a paper based on Accidental identification and navigation system. The system is special plan that helps to market usage of helmet so as to create bike driving safer than before.
- 4) Sreenithy Chandran and her team published a paper based on Konnect :An Internet Of Things(IOT) based smart helmet for accident detection and notification. It provides a means and equipment for detection and reportage accident. The vehicle location is obtained by creating use of the Global positioning system. The system guarantees a reliable and fast delivery of knowledge regarding the accident in real time and is appropriately named Konnect.

## II. PROPOSED SCHEME FOR SMART HELMET

An integrated network of sensors, ZigBee enabled processor, and cloud computing infrastructures are utilized to make the sensible helmet for accident detection and notification. The helmet is intended to find an accident and immediately alert emergency contacts. A 3-axis accelerometer measuring device is used to endlessly monitor the top orientation of the driver and the helmet's position and thence calculate the possibility of a accident. Once the edge limit is exceeded a text message containing the situation of the motive force is automatically initiated to the emergency contacts. The text messages are mechanically initiated at regular intervals to enable the contacts to find the motive force simply.

#### A. Challenges Associated With Automatic Detection And Notification Of Accidents

- 1) Need to stop false positives from being triggered .Network of sensors connected to the accident detection systems is used to see if associate degree accident has occurred. The modification in acceleration could be a key indicator. When the driver accidentally drops the helmet, there are chances of a false positive being triggered thanks to the abrupt changes within the measuring system price. Since the notification regarding the accident is being sent to the emergency contacts it's vital to suppress false positives. Else it'll lead to the faulty functioning of the system and wastage of resources on false incident reports.
- 2) Detection of the accident forces accurately. Conventional accident detection systems depend upon device networks embedded within the automobile. For instance, the sensors detect acceleration/deceleration, deflection etc., However it's out of the

question to induce such huge amounts of data from two wheelers. Thus, with the on the market resources and restricted provision capability, accurate detection of accident is required.

- 3) Delay in notification reaching the emergency contacts. As before long because the observance system detects associate degree accident, the information needs to be firmly transferred to the emergency contacts. Just in case the contact misses out the accident notification, then the system should be designed to recursively send the call till the call has been acknowledged.

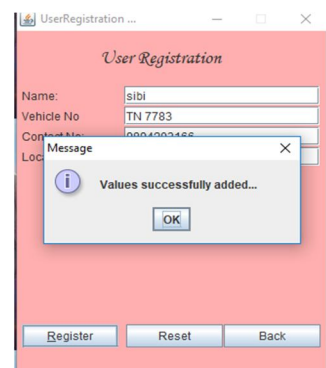
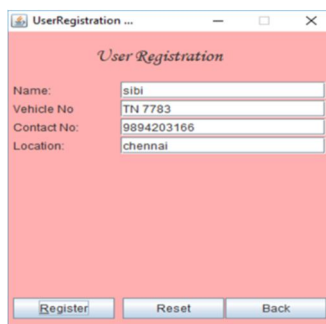
**B. Working Principle**

The smart helmet provides an inexpensive, effective accident detection and notification system to handle the problems. Through integration of vibration and impact sensors provides speedy accident detection, they are limited in terms of process and notification capabilities. The ZigBee enabled controller, which is used to hook up with an information network for accessing cloud services. This expands the procedure and storage capabilities of the system. The system on the helmet communicates with the cloud based mostly incidence response and notification system.

- 1) *Zigbee Pairing:* The driver should connect their mobile with ZigBee device that one is placed in bike before begin the bike. Then solely they will begin vehicle engine. Once the ZigBee synchronized the driving mode enabled in mobile. Suppose the helmet is not paired with ZigBee sensor then the person cannot ride the bike because the ZigBee is connected with bike’s engine.



- 2) *Android User Registration:* Mobile consumer is associate degree humanoid application that created and put in within the User’s humanoid mobile in order that we will perform the activities. Suppose the riders doing the malpractice embrace rash driving, triples and therefore the rider not sporting the helmet throughout the ride it’ll discover the knowledge through the image processing technique. Then the fine quantity are going to be subtracted from their checking account supported the malpractice and notification message will be sent to the various person concerning this malpractice. Here the admin can monitor and maintain the information.



- 3) *Sensor Synchronization*: In this module, we tend to implement accident identification includes vibration and IR device. Once bike user build associate, vibration device can vibrate and IR sensor await for synchronize with ZigBee. System can stay up for ten seconds if there's no response from user system will send notification to the police and ambulance.
- 4) *Auto Speed Control*: During driving mode if any call comes, at the time of incoming call an application mechanically cut all incoming calls. If suppose the call comes from the same number quite three times at intervals of five minutes suggest that application takes into account as emergency call. In order that an application permit the driving force to choose the calls and mechanically the vehicle speed are reduced and stopped.
- 5) *Helmet Theft Detection*: In this module, user's bike was larceny and after they try to wear it the ZigBee won't synchronize with the opposite helmet then mechanically GPS notification can send to the another registered number.

### III. CONCLUSION

We cannot manage the occurrences of accidents however taking precautions to avoid grievous injuries, thanks to Bell Auto parts for inventing helmets which is now a big life saver. The results of this project has evidenced that the traveller will be intimated to their family just in case of emergency scenario. Suppose if somebody isn't carrying helmet or rash driving they are detected through the image process technique and the notification is sent to the actual person for violating the rules, and fine amount will be deducted from concerned person's account. Suppose if the helmet is larceny, the other person won't be ready to try the helmet with their mobile mechanically the notification are sent to the owner.

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