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Safety measures for "Two wheelers by Smart Helmet and Four wheelers by Vehicular Communication"

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ABSTRCT:
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 different places of helmet where the probability of hitting is more which are connected to microcontroller board. So when the rider crashes and the helmet hit the ground, these sensors sense and gives to the microcontroller 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.
Vehicular communication is the best method for avoiding the collision as well as the traffic congestion.so here used VANET as network which has self-organizing, movable, more efficient, and communication establishes in decentralized manner. Here I simulate the VANET network in a two different scenarios, highway and urban using MAT lab for easy and well known to all.
Keyword: SENSORS, GSM/ GPS, SMARTHELMET, VANET ,RSU

I. INTRODUCTION

The thought of developing this project comes to do some good things towards the society. Day by day the two wheeler accidents are increasing and leads to loss of many lives. Accord to a survey of India there are around 698 accidents occurring due to bike crashes per year. The reasons may be many such as no proper driving knowledge, no fitness of the bike/car, fast riding of bike/car, drunken and drive etc. Sometime the person injured, the accident may not be directly responsible for the accident, it may be fault of rider, but end of the day it's both the drivers involved in the accidents who is going to suffer. If accidents are one issue, lack of treatment in proper time is another reason for deaths. According to the survey India 698 accidents occur per year, nearly half the injured people die due to lack of treatment in proper time.

The many reasons for this such as late arrival of ambulance, no persons at place where the accident occur to give information to the ambulance or parents. This is a situation we observe our day to day life, a thought of finding some solution to resolve this problem come up with this idea of giving the information about accident as soon as possible and in TIME….!!!!Because after all time matters a lot, if everything is done in time, at least we can save half the lives that are lost due to bike accidents.
Considering three major factors for avoiding the accident causes such as

I. Make wearing the helmet compulsory.
II. Avoid drunk and drive.
III. If person met with an accident, no one is there to help him. Simply leaving or ignoring the person he may die. In such situation, informing to ambulance or family members through mobile to rescue him for an extent.
IV. In vehicular communication there is problem with the proper routing information and in high way vehicles are fast moving so that providing an effective communication between the vehicles by using VANET.

The idea of this work is to give information about the rider wearing the helmet or not, whether the rider drunken or not and also, he met with an accident it gives an information about location where he is met with an accident through GSM module to mobile numbers family members, so I have chosen GSM technology to give the information by sending SMS, using GSM module which has SIM card slot to place the SIM and send SMS. Sending SMS alone can't help the driver, if we send and an SMS saying that accident had occurred where the ambulance will come without knowing the location of the accident. So to trace out the location where exactly accident occur using GPS module, and gives to microcontroller, then it sends the SMS which contains the latitude and longitude of an area to family members mobile numbers For this we use GPS module to extract the location of

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the accident, the GPS data will contain the latitude and longitude values using which we can find the accurate position of the accident place. Similarly for four wheelers in VANET technique for save the person lives and here I using MAT lab simulation of VANET for different areas. How the vehicles to vehicles communication and vehicles to RSU communication in highway and urban areas.
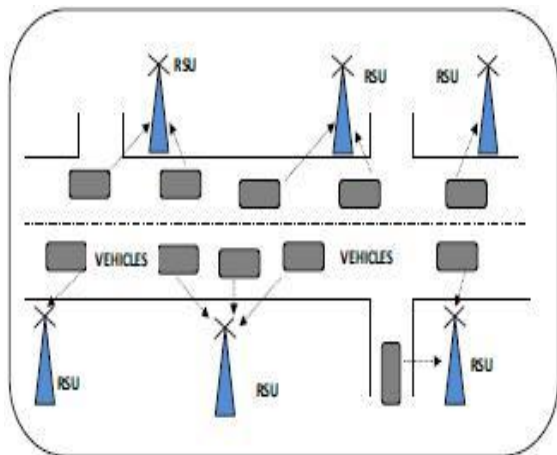
I. **I. FIGURES**

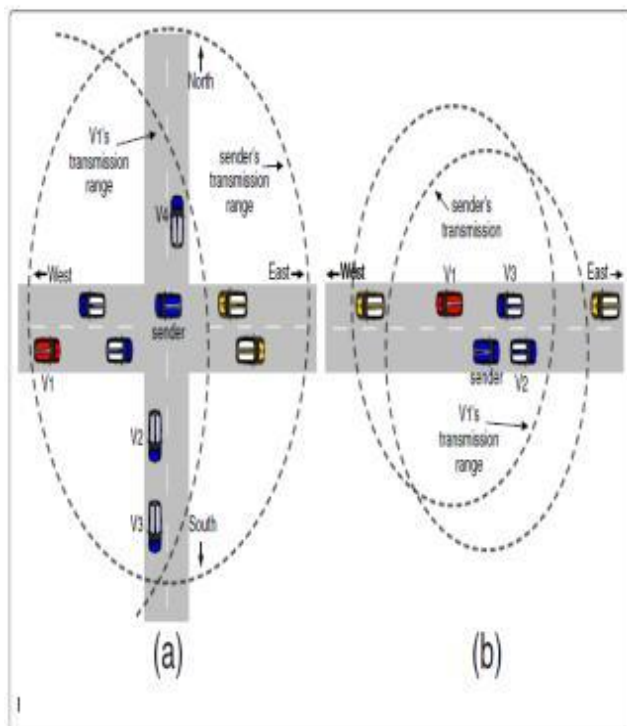Fig: 1 VANET communication architecture
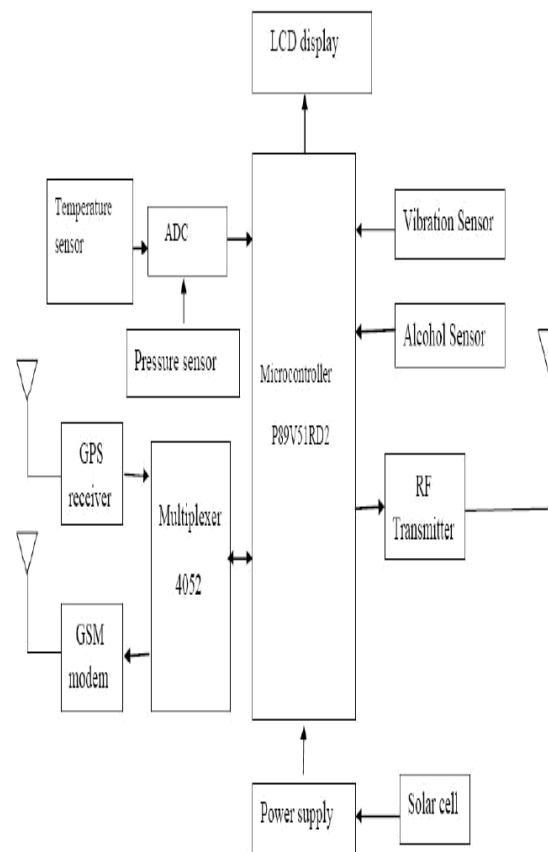

Fig: 2 Urban (a) and Highway (b) scenario

Fig: 2 Block diagram of smart helmet

A vehicle within a radio coverage range can communicate by using multi-hop communication without the support of the Fixed Road Side unit. Most of the previous works on routing protocols have been established for Mobile Ad-hoc Networks. Only a limited work has been done on vehicle to vehicle communication inside the city. But no major attempt has been so far made on vehicular communication outside the city area.

In addition to that this technology is used for data communication among the vehicles. For reliable high speed vehicle communication, a vehicular-based standard IEEE 802.11p technology is used.
The packets can be delivered from source vehicle to destination vehicle without using RSUs and each vehicle can act as a router. The performance parameters of routing protocols are analyzed for various nodes with different speeds of the nodes.
This part of the research work can be analyzed by using AODV routing protocol. The VANET architecture concepts in highways is shown in Fig 2
In the smart helmet system P89V51RD2 microcontroller is used. When the system is switched on, LED will be ON indicating that power is supplied to the circuit. The RF is used for start the two wheeler firstly it check whether the driver is

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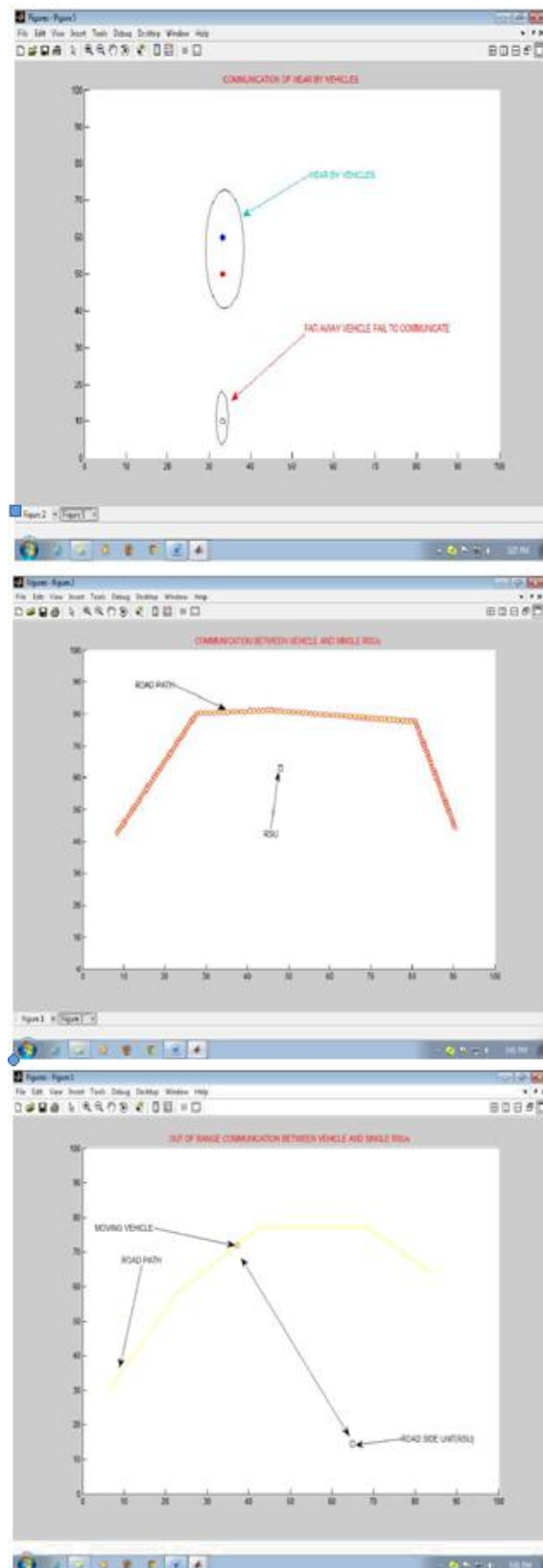*(NCDATES- 09th & 10th January 2015)*

drunken or not if drunken it will not allow to start two wheeler .The small voltage of ignition of the two wheeler is grounded. In normal condition when the helmet is wearied the pressure sensor is senses pressure and the RF transmitter radiates the FM modulated signal. The RF receiver is connected with the two wheeler which is receive the radiated signal and activate the relay .The relay is remove the ignition wire from the ground and connected with the starter switch now the two wheeler will start. When driver met with accident vibration sensor sends message to microcontroller. The GPS receives the location of the vehicle that met with an accident and gives the information back. This information will be sent to a mobile number through a message. This message will be received using GSM modem present in the circuit. The message will give the information of longitude and latitude values. Using these values the position of the vehicle can be estimated.
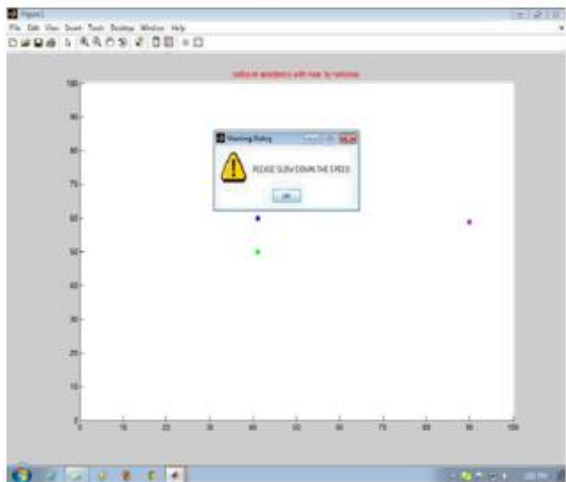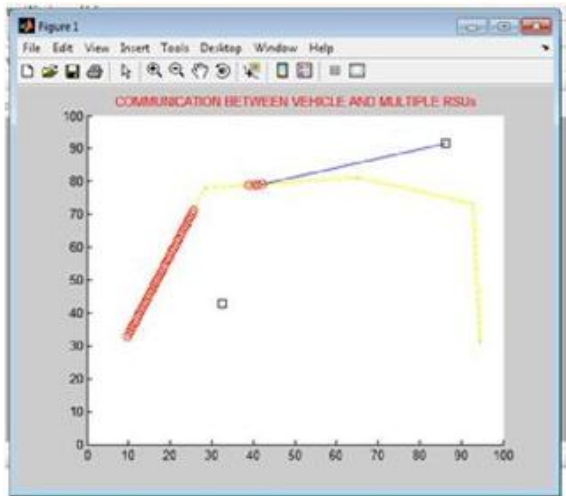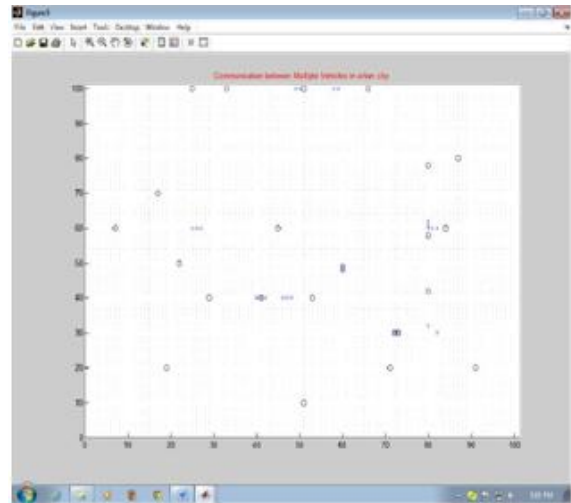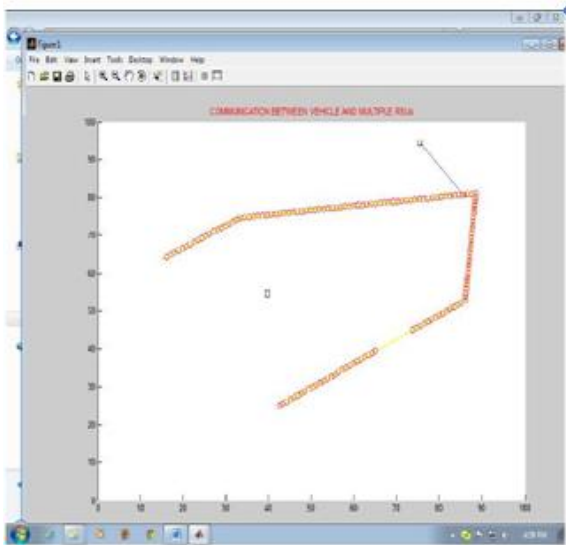
Now some of the thoughts in our mind, how will send the SMS using the GSM module by keeping the GPS location in the SMS which is obtained from the GPS module. But when should all this is done? When accident occurs, how will the microcontroller detect the accident? This can be done by using a vibration sensor which is placed in the helmet.

The vibration sensor is placed in the helmet such that it detects vibrations of the helmet. When the rider crashes, the helmet hits the ground and the vibration sensor detects the vibrations that are created when the helmet hits the ground and then the microcontroller detect the accident occurrence and it will send an SMS containing information about the accident and location of accident using GSM and 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 LCD display. Use of pressure sensor, gives the whether the rider wear the helmet or not. If he not wears the helmet again bike will not start and intimate to rider to wear the helmet.

III RESULTS
I.   Vehicular communication
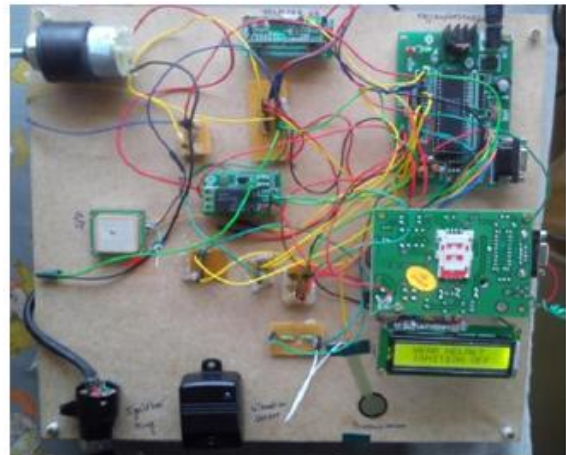
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II. Smart helmet

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IV. CONCLUSION

As the concluding part of this project, I would like to say that-- "Without proper action at proper time, danger awaits us with a bigger face." We must act on time when a person is injured. We must take care of person the way it is meant. Otherwise, a valuable life might be lost .We need to understand how precious lives of people are and what importance first-aid carries in saving these precious lives.

If this project imparts this idea in even one person, I would think that the project will be successful. In future the complete circuitry made in a single board and mass production of those can reduce the cost and size of complete system with long life with high efficiency.

In vehicular communication I would like to say if the communication range of the vehicles is longer they can exchange there information for a longer distances. Here I conclude that vehicles in urban areas are slow as well as in nearby, compare to high way. In highway vehicles are far and very fatly moving so there is larger data can be loss and they require much longer communication range and more RSUs on the road sides for longer communication.

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