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Design of Road Section for Automatic Severity Estimation of Automotive Accidents

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Abstract--The motorbike accident may be a major public drawback in several countries. Despite awareness campaign, this drawback remains increasing as a result of rider's poor behaviors like speed driving, drunk driving, riding with no helmet protection, riding while not comfortable sleep, etc. The numbers of death and incapacity square measure terribly high thanks to late help to people that got the accident. These cause large social and economic burdens to individuals concerned. Therefore, many analysis cluster and major motorbike makers together with have developed safety devices to safeguard riders from accidental injuries. However, sensible device for motorbike is tough to implement and really dearly-won.

Keywords:- ARMLPC2129 Microcontroller, MEMS, Vehicular Networks, GSM Modem, Crash Sensor, Tilt Sensor.

I. INTRODUCTION

Now a days road accidents cause major victims because there is no proper guidance to injured peoples at a time. To overcome this issue, vehicular networks plays a major role for giving rescue resources to accident peoples. A vehicular network is also called as VANET, Which is subcategory of traditional MANET. Hence VANET is a term, which is an instinctively formed ad-hoc network over vehicles within a range of roadway. In VANETs is a mobile node of vehicle each vehicle is endowed with On-Board Unit, which is able to communicate for exchanging message between Vehicle-to-Vehicle (V2V) as well as Vehicle-to-Infrastructure (V2I).

Message can be transmitted using various techniques as wireless and cellular networks infrastructure. However, VANETs are considered to be one of the most prominent technologies because it is improves its efficiency and safety for vehicle. If any accident occurs; it's automatically framing a networks and transmitting messages to within a range of vehicle for reducing the delay time of data transmission.

In an accident notification system using hybrid communication is the combination of both Vehicle-to-Vehicle communication and Vehicle-to-Infrastructure communication, which is providing short range communications as well as long-range communications using various wireless and cellular technologies. The main objectives of this system are reducing the delay time of data transmission and improve rescue resources to injured peoples. By using hybrid communication, warning messages can be transmitted to both vehicles and infrastructure of control database unit.

In a particular range of vehicles receives the warning messages from accident zone and transmitting those messages to other nearby vehicles also as road side units (RSU). Finally RSU forward those data into control database server (CDS), which is receive the warning messages form accident vehicle and providing the rescue resources based on the severity of the peoples.

II. PROPOSED SYSTEM

Have no text to check? haven't any text to check? Click "Select Samples". Our approach collects data gettable once a traffic accident happens, that's captured by sensors put in on board the vehicles. the data collected area unit structured in associate passing packet, and forwarded to an overseas management Unit through a mixture of V2V and V2I wireless communication. Supported this data, our system directly estimates the accident severity by examination the obtained data with data coming from previous accidents hold on in associate passing data.

This information is of utmost importance, as an example, to envision the foremost acceptable set of resources in associate passing operation. Since we might prefer to have confidence the knowledge obtained merely once the accident happens, to estimate its severity directly, we've got a bent to face live restricted by the data mechanically redeemable, omitting different data, e.g., regarding the driver's degree of attention, drowsiness,.

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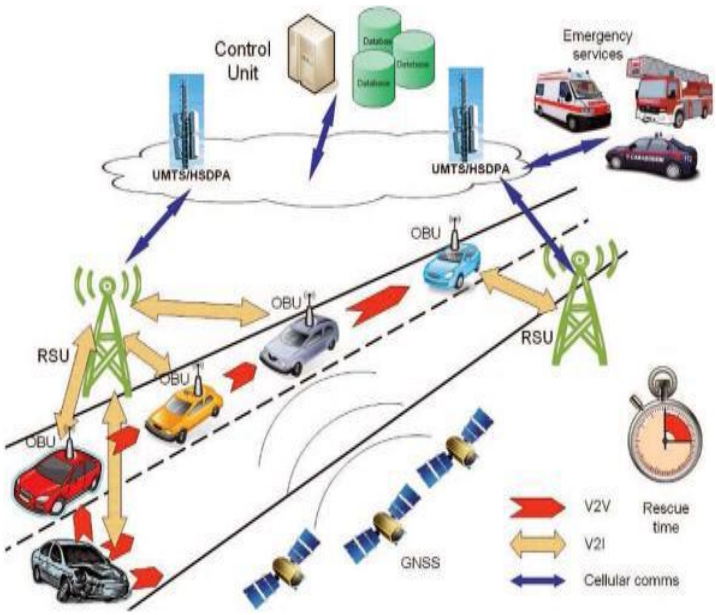

Fig. 1. Architecture of Our Proposed System for Automatic Accident Notification and Assistance Using Vehicular Networks.

III. IMPLEMENTATION

This chapter describes about the requirement analysis in accordance with the resources used. It also describes the implementation of the project with the tool used.

A. *Requirement Analysis*

It determines the requirements of a new system and analyze on product and resource requirement, which is required for the successful system. The product requirement includes input and output requirements it gives the wants in term of input to produce the required output. The resource requirements define in brief about the software and hardware that are needed to achieve the required functionality.

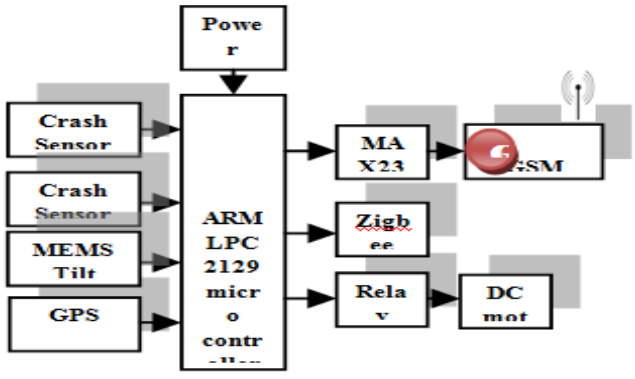

Fig 2 Block Diagram

IV. PROJECT OVERVIEW

Our approach collects information available when a traffic accident occurs, which is captured by sensors are structured in a packet, and forwarded to a remote Control Unit through a wireless communication. Based on this information, our system directly estimates the accident severity by comparing the obtained data with information coming from previous accidents stored in a database. This information is of utmost importance, for example, to determine the most suitable set of resources in a rescue operation. Since we want to consider the information obtained just when the accident occurs, to estimate its severity immediately, we are limited by the data automatically retrievable, omitting other information, e.g., about the driver's degree of attention, drowsiness, etc.

V. DESIGN OF ACCIDENT NOTIFICATION SYSTEM

As per our system design Fig. 1. Shows that, when a vehicle met associate accident mechanically generated warning messages supported On-Board Unit (OBU), that is placed inside the automotive. By mistreatment OBU, that is finds the situation of vehicle and severity of accident and generated warning messages eventually transmission messages into alternative near vehicles is additionally known as as V2V in transport networks at the same time forwarding that messages into management info Server (CDS) that is additionally known as as V2I. If someone during a conscious state while not occurring a significant injury alternatively if they feel don't wish tending treatment, they'll be terminated warning messages before causation to alternative vehicles and CDS by using switch.

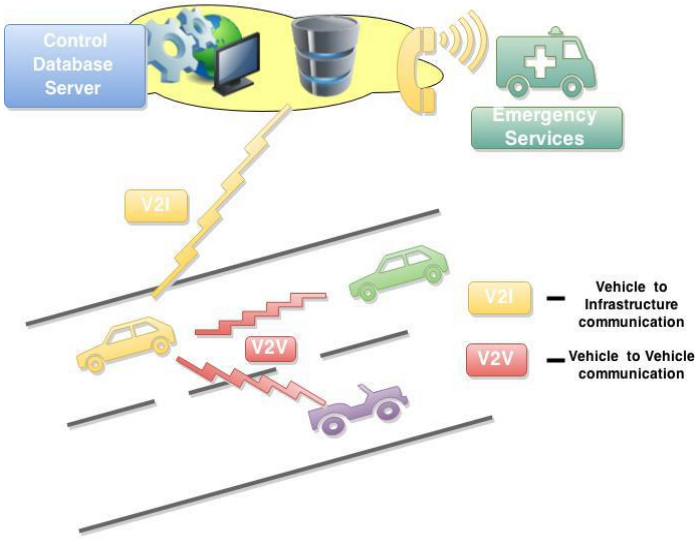

Fig.3 System Design

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The CDS is placed during a remote space, that is received the warning message from all alternative vehicle and conjointly from Road Side Unit (RSU). once its receive a waning messages from other vehicles and RSU, mechanically store the data into info and providing rescue services supported the severity of the accidents.

In this Fig. 4. Represent the communication between vehicles to CDS. In-Vehicle system comprises OBU, which is lies intermediate the vehicles.

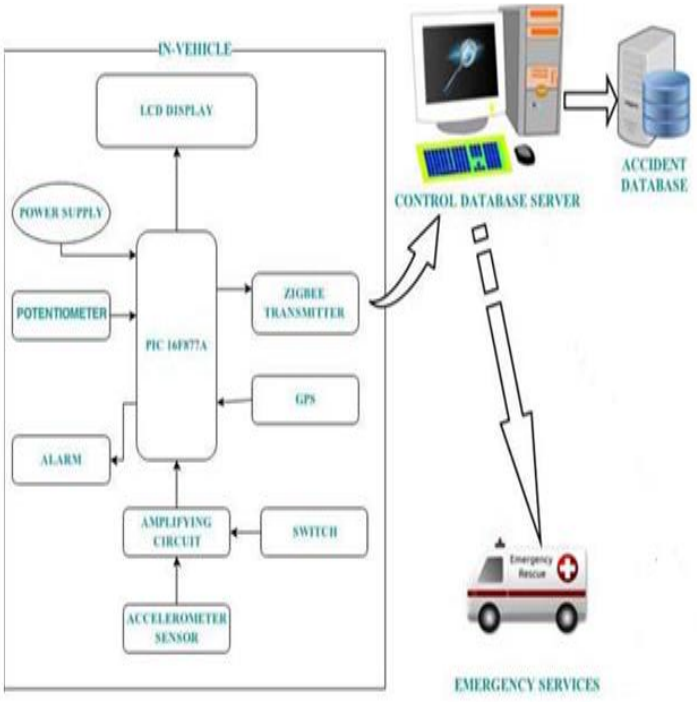

Fig. 4. design of Accident Notification System

The design of accident notification system shows that in-vehicle observance, management server observance and information sharing to emergency services. If any crucial event occurs suddenly measuring system device observance the action based on motion of the automotive and intimate to microcontroller. Microcontroller processed the data of action supported GPS, potentiometer speed and device. If the person doesn't pretend any serious action, they'll terminate the messages using switch within the OBU. Finally send those warning message to CDS through wireless ZigBee technology. management info Server receives the data from On-Board Unit and stores the appropriate message and passes that message into emergency services.

A. Management Info Server

The management info Server (CDS) is associated to the response center guilty of receiving notifications of accidents from the OBUs put in in vehicles. particularly, the management info Server is accountable for addressing warning messages, retrieving data from ZigBee receiver and it's keep into info and informing to Emergency Services like machine, police stations.

B. Receiving Warning Messages

The first method for the CDS is to receiving warning messages from a collided vehicle and these should be a module waiting for retrieving messages from out there completely different fields of vehicle.

C. Analyzing Severity of Accident

When a brand new accident notification message is received, this module can analyst however serious the collision was, and the severity of the passenger's injuries.

VI. RESULT AND ANALYSIS

This chapter shows the final output scenario of the project. The working of the project is shown in this chapter.

A. Output Scenario

a). The Hardware System Turns ON

Fig.5 Hardware of the Project

b). The Display of Road section Unit When Turns ON

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Fig. 6. Output

c). If The Accident Occurred the System Will Notify This Message

Fig. 7. Notification of Accident.

d). The System will Send the Information of Accident to a GSM Mobile No. Through GSM Module With Longitude And Latitude Values.

Fig 8 Location Of Accident Occurred

VII. CONCLUSION

The new communication technologies integrated into the automotive sector offer an opportunity for better assistance to people injured in traffic accidents, reducing the response time of emergency services, and increasing the information they have about the incident just before starting the rescue process. To this end, we designed and implemented prototype for automatic accident notification and assistance based on V2V and V2I communications. However, the effectiveness of this technology can be improved with the support of intelligent systems which can automate the decision making process associated with an accident. A pre luminary assessment of the severity of an accident is needed to adapt resources accordingly. This estimation can be done by using historical data from previous accidents using acknowledge Discovery in Databases process. Most of the existing work focused on data mining in traffic accidents is based on data sets where a very limited preprocessing and transformation were performed. After careful selection of relevant attributes, we showed that the vehicle speed is a crucial factor in front crashes, but the type of vehicle involved and the speed of the striking vehicle are more important than speed itself in side and rear-end collisions. The status of the airbag is also very useful in the estimation, since situations where it was not necessary to deploy the airbag rarely produce serious injuries to the passengers. The studied classification algorithms do not show remarkable differences, but we demonstrate that, if we are able to classify the accidents depending on the types of impacts, we can noticeably increase the accuracy of the system, especially for front crashes where the vehicle is usually the striking one. To this end, we developed a prototype that shows how inter-vehicle communications can make accessible the information about the different vehicles involved in an accident. Moreover, the positive results achieved on the real tests indicate that the accident detection and severity estimation algorithms are robust enough to allow a mass deployment of the proposed system.

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