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Vehicle Accident Detection and Alerting System

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Abstract*: In this paper, we proposed a system to detect vehicle accident and alert to the family member as well as nearby police control rooms and hospitals. The numbers of accidents happening in our country are increasing rapidly everyday and existing systems for a person who meets with an accident are weak as per the ratio. Also the existing systems are focusing mostly on prevention of accident rather than taking immediate actions after an accident; so that the person could be save. The aim of the project is to detect the road accidents and to provide immediate help for needy which avoids the loss of valuable human life.
Keywords*: RF transmitter and receiver, LCD, Atmega 328 Microcontroller, Vibration Sensor, Regulator GSM module.

I. INTRODUCTION

Transportation has great importance in our daily life and its development has made many of our chores much easy. But it can cause disaster to us and even can kill us through accidents. During 2008, Road Traffic Injuries ranked fourth among the leading causes of death in the world. Nearly 1.3 million people die every year on the world's roads and 20 to 50 million people suffer non-fatal injuries, with many sustaining a disability as a result of their injury. Road traffic injuries are the leading cause of death among young people aged 15-29 years and cost countries 1-3% of the gross domestic product (GDP). If no action is taken, road traffic crashes are predicted to result in the deaths of around 1.9 million People annually by 2020. [1]

When an individual riding his/her bike, meets with an accident, there is a chance that the individual may suffer from a serious injury or expire instantaneously and there is no one around to help him. Well this system is a solution to the problem. The system acts as an accident identification system that gathers and sends this vehicle information that met with an accident, and conveys it to the nearest police control room and ambulance.

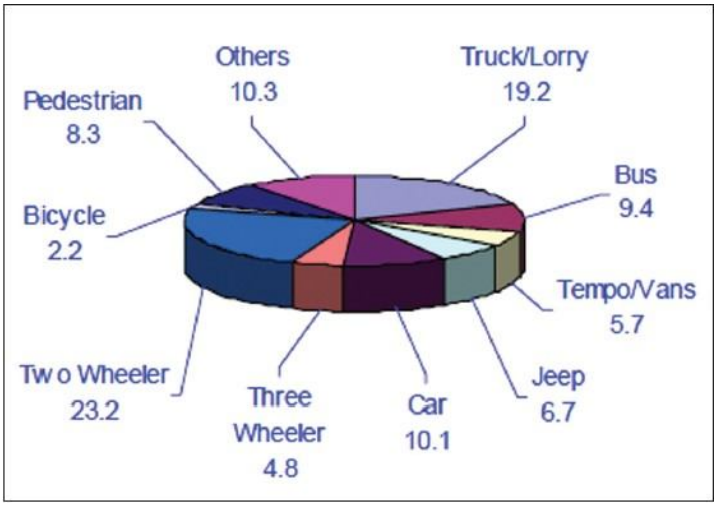


Fig. 1 Percentage of accident in India [2]

II. LITERATURE SURVEY

In highly populated Countries like India, everyday people lose their lives because of accidents and poor emergency facilities. These lives could have been saved if medical facilities are provided at the right time. This paper implies system which is a solution to this drawback.

Traditional traffic accident prediction uses long-term traffic data such as annual average daily traffic and hourly volume. In contrast to traditional traffic accident prediction, real-time traffic accident prediction relates accident occurrences to real-time traffic data obtained from various detectors such as induction loops, infrared detector, camera etc. Real-time traffic accident prediction focuses on the change of traffic conditions before an accident occurrence, while traffic incident detection studies are concerned with the

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change of traffic conditions after an incident occurrence. Manual incident detection methods detects the accident from the motorist report, transportation department or public crews report, aerial surveillance or close circuit camera surveillance.

III. PROPOSED SYSTEM

In this system RF transmitter and GPS tracking system are used for accident detection. When accident occurs, this system sends short message to mobile number via GSM modem. Message will give longitude and latitude values. From these values location of accident can be determined.

For this the user vehicle is fixed with an RF transmitter circuit that has a vibration sensor along with microcontroller, RF encoder and also fitted with an RF transmitter. Each and every control room must have an RF receiver fitted to receive the transmission. Whenever a user vehicle meets with any accident, the vibration sensor detects and gives its output. This output is then detected by the microcontroller. Now the microcontroller sends this change detection signal to an RF transmitter. The RF transmitter now intern begins transmitting this accident data. The nearest RF transmitter reads the signal and then shows it on an LCD screen. The person monitoring the LCD screen may react to it, reach the accident location and help the needful.

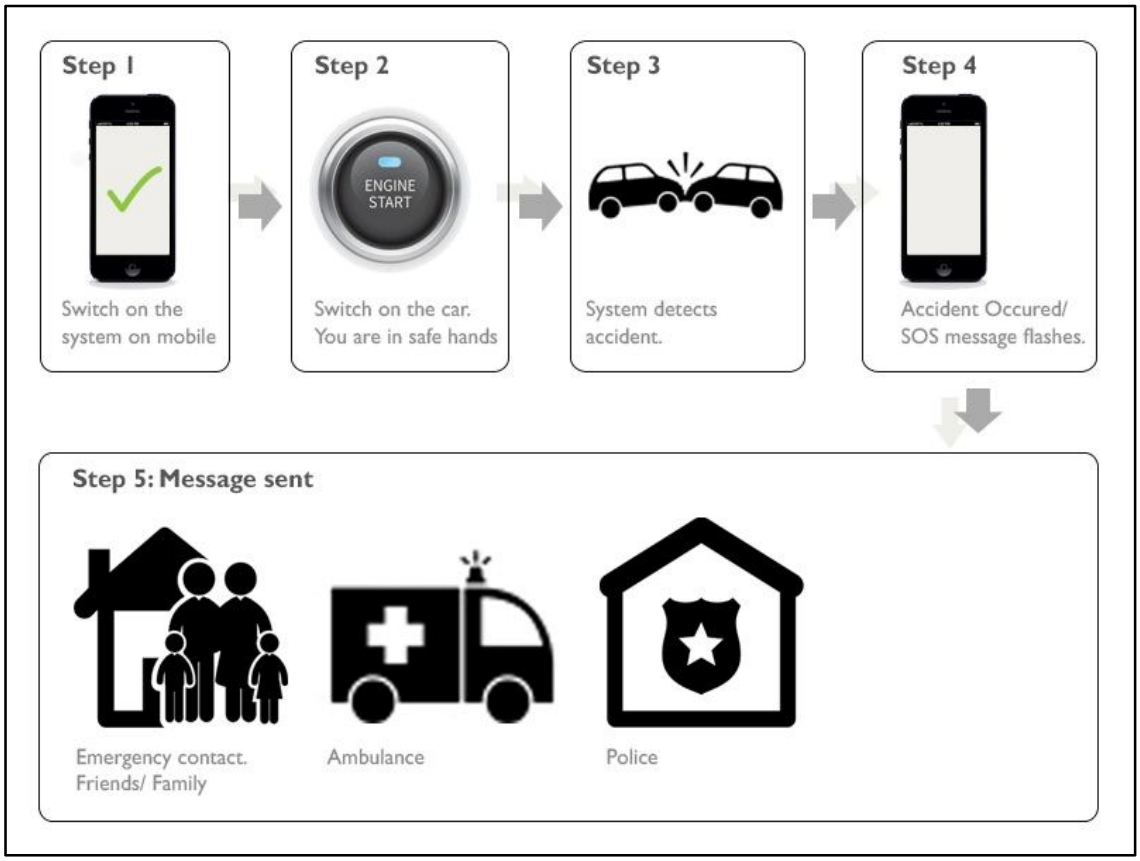


Fig. 2 Example of structure of proposed system

A. *Transmitter*

An RF module (radio frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between two devices. In an embedded system it is often desirable to communicate with another device wirelessly.

B. *Receiver*

An RF module (radio frequency module) is a (usually) small electronic device used to transmit and/or receive radio signals between two devices. The vibration sensor, which is useful for a variety of different fields, has the ability to detect vibrations in a given area. This can help to alert someone to trouble with a system, and you will even find these types of sensors in use with security systems today.

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IV. SCOPE OF PROJECT

A. The system will be used to inform the ambulance about accidents.
B. The system will be used to inform the control room about accidents.
C. The system will be used to inform the hospital about accidents.
D. The RF transmitter will transmit the emergency signal whenever the vibration sensor will detect that accident has occurred.
E. The system is compact and can be fitted on the vehicle.
F. The message not only goes to the relatives but also the message is send to control room.

V. ARCHITECTURE MODEL

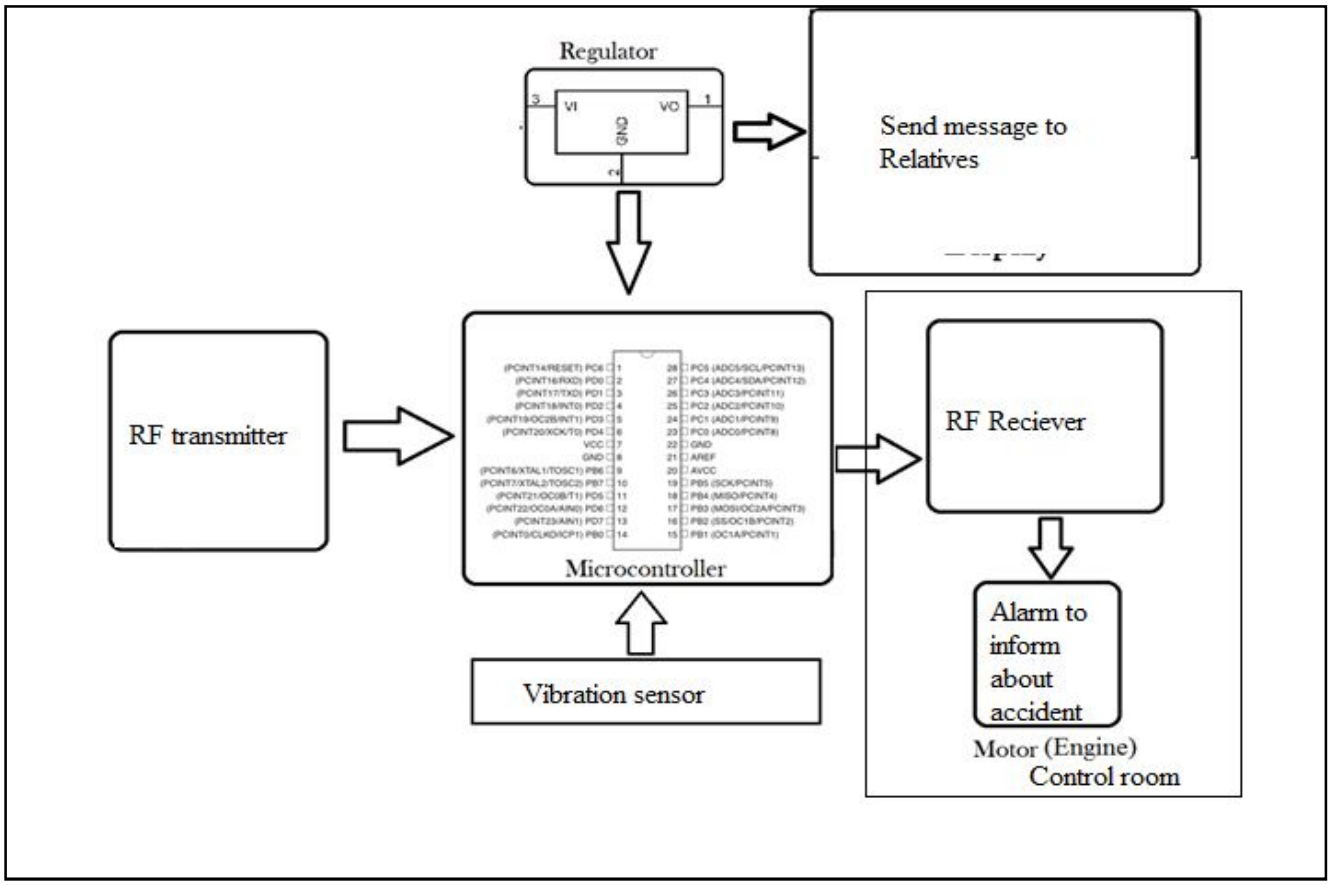


Fig. 3 Architecture of proposed system

VI. ADVANTAGES OF THIS SYSTEM

A. Low power consumption, low cost, small size, excellent performance
B. Provides efficient way to inform accidents.
C. Fast rescue can be provided as control room is informed.
D. User friendly and small in size.

VII. LIMITATIONS OF THIS SYSTEM

A. Additional hardware to be attached to vehicle.
B. Battery life of the system.

VIII. CONCLUSION

This project presents vehicle accident detection and alert system with SMS to the user defined mobile numbers. The GPS tracking and GSM alert based algorithm is designed and implemented with LPC2148 MCU in embedded system domain. The proposed Vehicle accident detection system can track geographical information automatically and sends an alert SMS regarding accident.

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Experimental work has been carried out carefully. The result shows that higher sensitivity and accuracy is indeed achieved using this project. EEPROM is interfaced to store the mobile numbers permanently. This made the project more user-friendly and reliable. The proposed method is verified to be highly beneficial for the automotive industry.

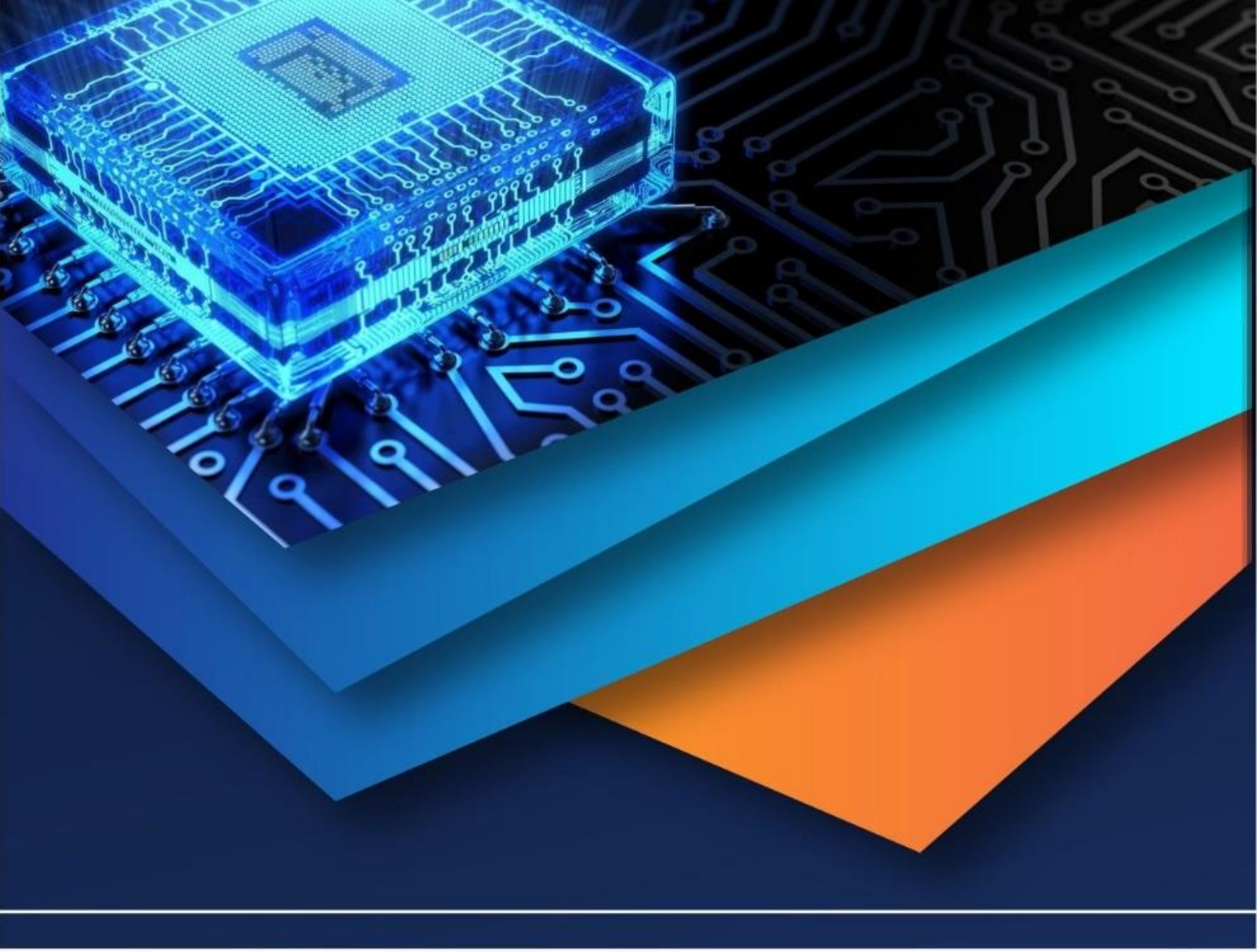
IX. ACKNOWLEDGMENT

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