Intervehicular Accident-Detection with Ambulance Rescue System for Humans

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Abstract — **In recent years, road accidents and traffic congestion are the major problems in urban areas. Currently there is no technology for accident detection. Also due to the delay in reaching of the ambulance to the accident location and the traffic congestion in between accident location and hospital increases the chances of the death of victim. There is a need of introducing a system to reduce the loss of life due to accidents and the time taken by the ambulance to reach the hospital. To overcome the drawback of existing system we will implement the new system in which there is an automatic detection of accident through sensors provided in the vehicle. A main server unit houses the database of all hospitals in the city. A GPS and GSM module in the concerned vehicle will send the location of the accident to the main server which will rush an ambulance from a nearest hospital to the accident spot. Along with this there would be control of traffic light signals in the path of the ambulance using RF communication. This will minimize the time of ambulance to reach the hospital. A patient monitoring system in the ambulance will send the vital parameters of the patient to the concerned hospital. This system is fully automated, thus it finds the accident spot, controls the traffic lights, helping to reach the hospital in time.**

Index Terms — **Rescue people, GPS,GSM.**

I. INTRODUCTION

Today many human beings lose their lives through the vehicle accidents. Moreover road accidents in the city have been nonstop and to bar the loss of life due to the accidents is even more crucial. Modern embedded systems are often based on microcontrollers but ordinary microprocessors are also still common, especially in more complex systems. Microcontroller used for the total response of the accident detection and rescue method. The PIC16f877a is a 8-bit Microcontroller which used for the rescue scheme. It used in the Ambulance section for receiving the signals. The information about the accident automatically send to the hospital.

In the ambulance section Bio sensor used for monitoring the patient health status which can be handled by medical guidance.The RF transmitter is used to emits the signal continuously from the ambulance.In the signal section the traffic signal can be controlled using ITS system.It used in the field of road transport and in traffic management .For easy access the server maintains a database for each node, and hence each node will have a unique id for addressing it.So the ambulance can reach the hospital within a time.Suppose if there is any problem in traffic congestion the ambulance can be diverted to the nearest hospital.This can be done by adhoc network which uses shortest path algorithm to find nearest hospital.

II. EXISTING SYSTEM

Currently there is no technology for accident detection. As it is done manually there is loss of life in golden hours. The accident victim is dependent on the mercy of others to rush him to hospital. Many a times an accident goes unnoticed for hours before help comes in. Due to all these factors there is a high rate of mortality of the accident victims. In addition to this there is delay in the ambulance reaching the hospital due to the traffic congestion between accident location and hospital which increases the chances of death of victim.

III. PROPOSED SYSTEM

To overcome the drawback of existing system we will implement the new system in which there is an automatic detection of accident. A sensor, GPS,

GSM unit fitted in the vehicle detects the accident and sends the accident location to a main server unit which houses the database of all the nearby hospitals. An ambulance is rushed to the accident spot which carries the patient to the hospital and simultaneously monitors the vital parameters like temperature and pulse rate and conveys them to the concerned hospital. Along with this there would be control of traffic light signals in the path of the ambulance via RF communication to provide a clear path for the ambulance. This will minimize the time required by the ambulance to reach the hospital.

The system consists of three main units, which coordinate with each other and make sure that the ambulance reaches the hospital without any time lag. Thus our system is divided into following four units:

1. The vehicle unit.
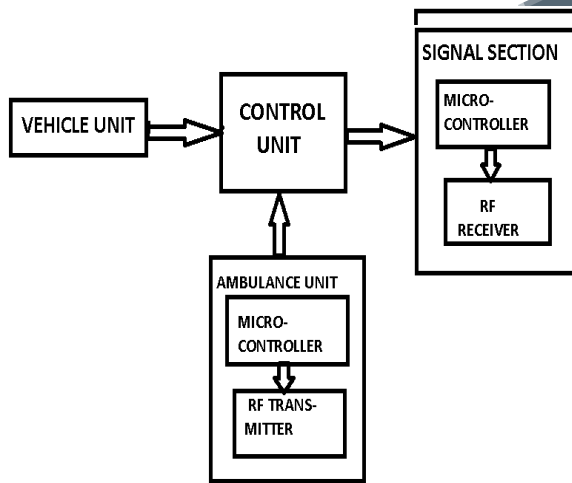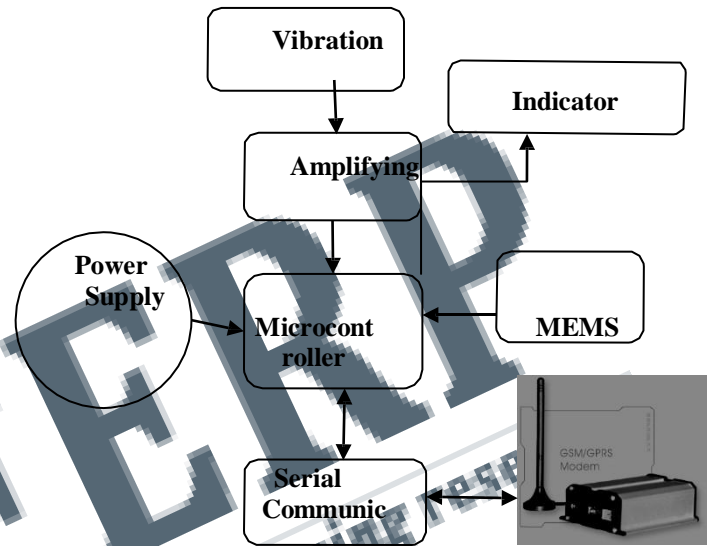2. The ambulance unit.
3. Signal unit.

finds out current position of vehicle (latitude and longitude) which is the location of accident spot and gives that data to GSM module. This information to the main server is conveyed by GSM module. There is also provision of avoidance of accident by using accelerometer (ADXL 335). Accelerometer alerts the driver by turning on the buzzer whenever the position deviates from the normal

B.Ambulance unit

Fig1: block diagram of system

A.Vehicle Unit

For implementation of this project, vehicle unit should be installed in every vehicle .It consists of microcontroller along with the accelerometer, GPS and GSM module and sensors to sense the accident. On impact on the vehicle, information about accident is send to the main server. This information consists of the location of accident detected by GPS module installed in vehicle. The GPS system

Control unit sends the ambulance to the accident location. Ambulance collects the victim from the accident location. While in the ambulance the vital parameters of the patient temperature and pulse rate are continuously monitored and conveyed to the concerned hospital. We are using LM35 temperature sensor whose output voltage is linearly proportional to the Celsius (centigrade).For measuring pulse rate we are using IR based obstacle sensor. Normally there is delay in ambulance reaching the hospital due to traffic congestion. To overcome this delay, the traffic signals in the path of ambulance are controlled via RF communication. The ambulance section consists of an RF transmitter and the traffic unit will consist of the RF receiver. The RF transmitter on the ambulance will communicate with the RF receiver of the signal section and make the signal green whenever it is within a 100m radius. As

a result of which the ambulance will have a clear path all along its way to the hospital without any traffic congestion.
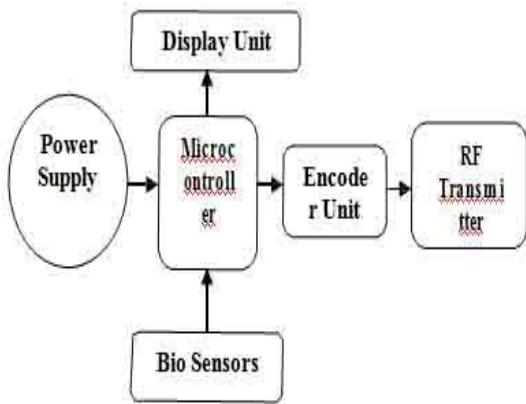

Fig3: block diagram of ambulance unit

C. Signal Unit

Whenever the ambulance reaches to the traffic signal (approximately 10m) the traffic signal will be made to green through RF communication. Thus the ambulance will have clear path to reach the hospital without any traffic congestion along the way. This system is fully automated, thus it finds the accident spot, controls the traffic lights, helping the victim to reach the hospital in time.
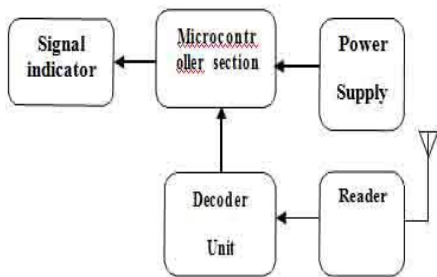

Fig4: block diagram of signal unit

IV. RESULTS

Thus we have developed the above mentioned units and successfully coordinated the system .For the main server unit we have created a database using visual basic 6.0 on PC. For the prototype the communication between the ambulance and traffic

unit takes place via RF transmitter and RF receiver.

Fig5: Accident location displayed on the LCD

Figure shows the vehicle unit and the position of accident as detected by the GPS in Vehicle unit. The accident location is then sent to the main server unit that houses the database of all the nearby hospitals and sends an ambulance to the accident spot.

Fig 6: Vital parameters displayed on LCD

In the ambulance the vital parameters such as temperature, pulse rate etc. are continuously monitored and send to the concerned hospital. All the traffic signals in the path are controlled via RF Communications.

IV. CONCLUSION

In this paper, we have presented a system to detect accident automatically and give a clear way to emergency purpose vehicles on road so that they can reach their destination in least time without stopping at tr affic intersection. This system can be effectively implemented for an entire city or countries with large population like India for better results.
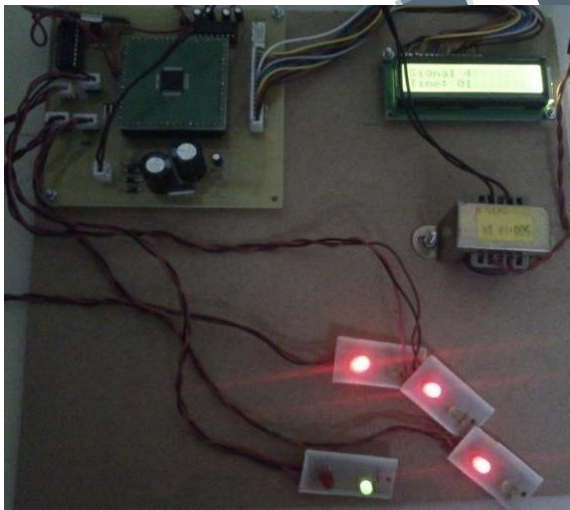
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Fig 7: Traffic junction unit.

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