



A Novel Rescue System At Congested Traffic Cities

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Abstract: In this paper, I have presented to overcome major problems in modern urban areas which have caused much uncomfortable for the ambulance due to the traffic. Moreover road accidents in the city have been nonstop and to bar the loss of life due to the accidents is even more crucial. To implement this we introduce a scheme called AARS (Automatic ambulance rescue system). The main theme behind this scheme is to provide a smooth flow for the ambulance to reach the hospitals in time and thus minifying the expiration of many lives through the GSM, GPS and different sensors. The idea behind this scheme is to implement a ITS which would control mechanically the traffic lights in the path of the ambulance.

Keywords-GPS, GSM and Sensor modules.

I. Introduction

Rescue comprises responsive operations that usually involve the saving of life or prevention of injury during an incident or dangerous situation. An idea of a rescue robot is a robot that has been designed for the purpose of rescuing people. Common situations that employ rescue robots are mining accidents, urban disasters, hostage situations, and explosions. The benefits of rescue robots to these operations include reduced personnel requirements, reduced fatigue.

If a vehicle met with an accident the message came to control room or a rescue team by using GPS and GSM Technology. GPS is a fleet of more than 24 communications satellites that transmit signals globally around the clock. With a GPS receiver, one can quickly and accurately determine the latitude, the longitude, and in most cases the altitude of a point on or above Earth's surface. GSM use a Subscriber Identity Module (SIM) smart card that contains user account information. Any GSM phone becomes immediately programmed after plugging in the SIM card, thus allowing GSM phones to be easily rented or borrowed. Here an accelerometer (MEMS) is used in a car alarm application;

II. Sensing Elements

MEMS Sensor can be detected with an accelerometer. It can be used as a crash recorder of the vehicle movements before, during and after a crash. With signals from an accelerometer, a severe accident can be recognized. According to this paper when a vehicle met with an accident immediately the vehicle number and persons contact number will be transferred to control room or a rescue team. So the rescue team can immediately trace the location from where the message came. Then after conforming the location necessary action will be taken. In second application on an uncertain situation many of vehicles that have center locking system, Such as door locking system faces many problems due to automatic locking system. At that situation there is no way to open the lock. Our project will provide a suitable solution for this situation.

Vibration sensors detect the vibration of the ground soil in case of a debris flow. Prior to installing a vibration sensor, it is extremely important to determine what level of vibration is appropriate to activate the sensor in case of a debris flow. It is also important to keep in mind the risk of unintentional activation caused by earthquakes, as well as areas in which there is construction traffic and other vibration causes that may activate the sensor.

Machinery damage and costly production delays caused by unforeseen machinery failure can be prevented.

When pending problems are discovered early, the plant engineer has the opportunity to schedule maintenance and reduce downtime in a cost effective manner.

Vibration analysis is used as a tool to determine machine condition and the specific cause and location of machinery problems.

This expedites repairs and minimizes costs.

Global Positioning System (GPS) comprises three segments:

- The space segment (all functional satellites)
- The control segment (all ground stations involved in the monitoring of the system master control station, Monitor stations, and ground control stations)
- The user segment (all civil and military GPS users).

During the development of the GPS system, particular emphasis was placed on the following three aspects:

- a) It had to provide users with the capability of determining position, speed and time, whether in motion at rest.
- b) It had to have a continuous, global, 3-dimensional positioning capability with a high degree of accuracy, Irrespective of the weather.

It had to offer potential for civilian use.

Vehicle section

(A) RF transmitter and receiver Radio Frequency, any frequency within the electromagnetic spectrum associated with radio wave propagation. When an RF current is supplied to an antenna, an electromagnetic field is created that then is able to propagate through space. Many wireless technologies are based on RF field propagation Radio Frequency: The 10 kHz to 300 GHz frequency range that can be used for wireless communication. Also used generally to refer to the radio signal generated by the system transmitter, or to energy present from other sources that may be picked up by a wireless receiver.

(B) Transmitter The TWS-434 extremely small, and are excellent for applications requiring short-range RF remote controls. The transmitter module is only 1/3 the size of a standard postage stamp, and can easily be placed inside a small plastic enclosure.

TWS-434: The transmitter output is up to 8mW at 433.92MHz with a range of approximately 400 foot (open area) outdoors. Indoors, the range is approximately 200 foot, and will go through most walls.

(C)Receiver RWS-434: The receiver also operates at 433.92MHz, and has a sensitivity of 3uV. The WS-434 receiver operates from 4.5 to 5.5 volts-DC, and has both linear and digital outputs.

(D)Transmitting and receiving Full duplex or simultaneous two-way operation is not possible with these modules. If transmit and receive module are in close proximity and data is sent to a remote receive module while attempting to simultaneously receive data from a remote transmit module, the receiver will be overloaded by its close proximity transmitter. This will happen even if encoders and decoders are used with different address settings for each transmitter and receiver pair. If two way communications is required, only half duplex operation is allowed.

Heart beat sensors

The sensor consists of a light source and photo detector; light is shone through the tissues and variation in blood volume alters the amount of light falling on the detector. The source and detector can be mounted side by side to look at changes in reflected light or on either side of a finger or earlobe to detect changes in transmitted light. The particular arrangement here uses a wooden clothes peg to hold an infrared light emitting diode and a matched phototransistor. The infrared filter of the phototransistor reduces interference from fluorescent lights, which have a large AC component in their output.

The skin may be illuminated with visible (red) or infrared LEDs using transmitted or reflected light for detection. The very small changes in reflectivity or in transmittance caused by the varying blood content of human tissue are almost invisible. Various noise sources may produce disturbance signals with amplitudes equal or even higher than the amplitude of the pulse signal. Valid pulse measurement therefore requires extensive pre-processing of the raw signal.

ZigBee:

The XBee/XBee-PRO RF Modules are designed to operate within the ZigBee protocol and support the unique needs of low-cost, low-power wireless sensor networks. The modules require minimal power and provide reliable delivery of data between remote devices. The modules operate within the ISM 2.4 GHz frequency band and are compatible with the following:

- XBee RS-232 Adapter
- XBee RS-232 PH (Power Harvester) Adapter
- XBee RS-485 Adapter
- XBee Analog I/O Adapter
- XBee Digital I/O Adapter
- XBee Sensor Adapter
- XBee USB Adapter
- XStick
- Connect Port X Gateways
- XBee Wall Router.

The XBee/XBee-PRO ZB firmware release can be installed on XBee modules. This firmware is compatible with the ZigBee 2007 specification, while the ZNet 2.5 firmware is based on Ember's proprietary "designed for ZigBee" mesh stack (EmberZNet 2.5). ZB and ZNet 2.5 firmware are similar in nature, but not over-the-air compatible. Devices running ZNet 2.5 firmware cannot talk to devices running the ZB firmware.

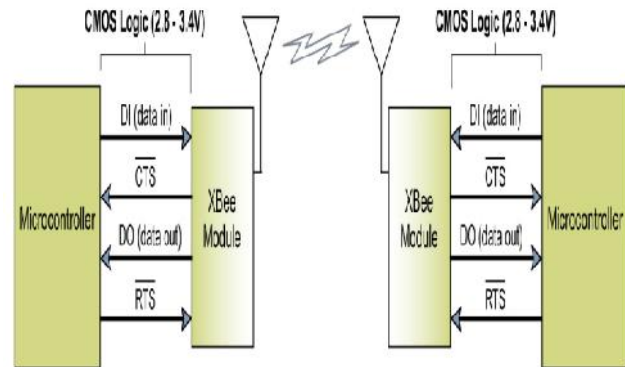


Fig. 1 ZigBee Protocol

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III. Designing Section

In this below design process was implemented in Ambulance internally.

Ambulance System:

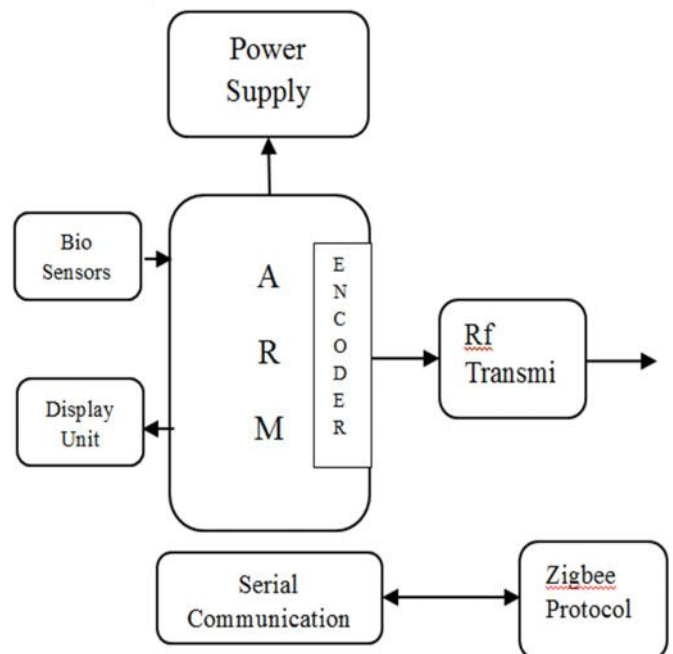


Fig. 2 Ambulance system

In this we can have bio sensors to monitor health of the Injury person and sending information to the concern doctors for the FIRST AID purpose. Through the ZigBee module the information will pass. Here ARM processor is perfectly scheduled for receiving sensing information and doctors instructions through ZigBee to monitor the health.

Vehicle System:

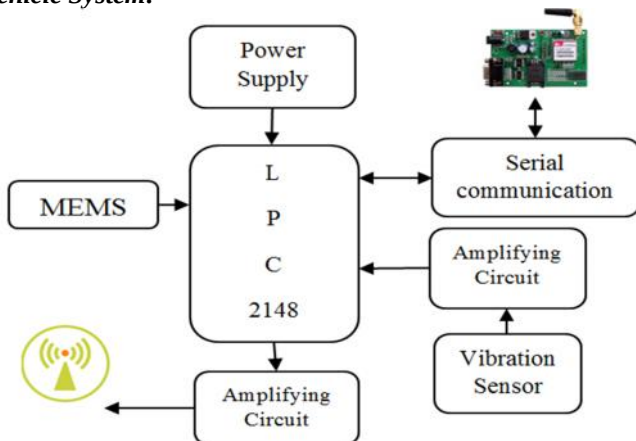


Fig. 3 Vehicle System

In this Vehicle system, we can automatically sense the accidents through the Vibration and MEMS sensors. The information will automatically generate through GPRS based technology. By using wirelessly also the information will send to the control room.

Signal System:

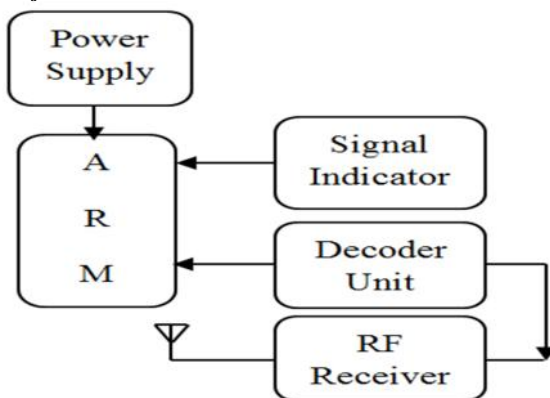


Fig. 4 Signal System

In this Signal System, the signal indicator may get active if the RF receiver can receive the signal from the ambulance transmitter. In the ARM processor we can able to get schedule to rescue immediately for monitoring all the signals wirelessly throughout the way the ambulance can travel towards hospital. By using wirelessly the communication process in this proposed paper will become very fast for rescue operations to save human lives.

Hospital System:

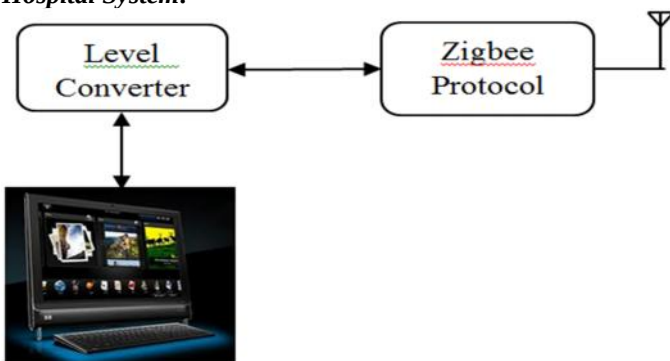


Fig. 5 Hospital System

In this Hospital system, we can monitor the status of injury person who is under rescue operation. Through ZigBee protocol the doctor can monitor the health status wirelessly to save lives.

Conclusion

The ambulance is controlled by the central unit which furnishes the most scant route to the ambulance and also controls the traffic light according to the ambulance location and thus reaching the hospital safely. The GPRS determines the location of the accident spot through the sensor systems in the vehicle which encountered the accident and thus the Rescue system walks through the ambulance to the spot. This scheme is fully automated, thus it finds the accident spot, controls the traffic lights, helping to reach the hospital in time.

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