

An Emergency Ambulance Security System by the Shortest Route Using Prioritised Traffic Signaling

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Abstract

In our world traffic problem is one of the main concerns in daily life. During office hours emergency vehicles like ambulances, water tanks, police vehicles, fire controllers will be delayed due to these traffic jams. Because of these the emergency vehicles are not reaching properly in time to the hospitals and it will results to loss of death. So to control these we developed a system called "An Advanced ambulance rescue system". Which will provide clear route to the emergency vehicles by changing traffic signal automatically by green through which side the emergency vehicle is. The entire system is controlled automatically by signal itself so this is can be termed as "AARS" (Advanced ambulance rescue system). The system can be implemented to identify criminals/terrorist vehicle and also we can send a message to the hospital regarding any accident occurs in city also. It regards to traditional tracking system by using Global Positioning system, This system is fully advanced, thus it finds accident spot by controlling traffic signal which helps to reach nearest hospital in time, loss of human lives can be controlled.

Keywords: AARS, GPS, Traffic

1. Introduction

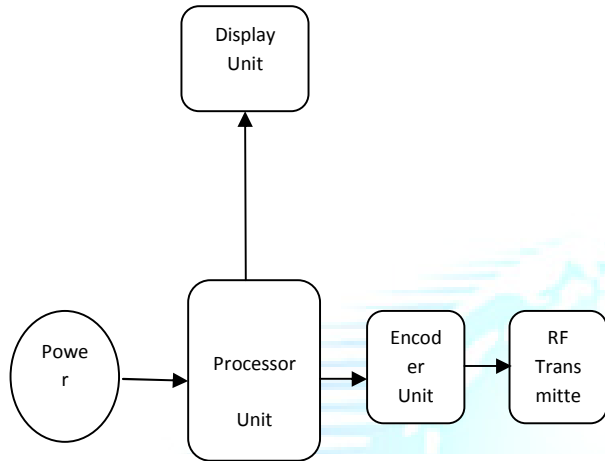
When a vehicle met with an accident the message came to control room or a rescue team by using GPS and GSM Technology. GPS is a fleet of more than 24 communications satellites that transmit signals globally around the clock. With a GPS receiver, one can quickly and accurately determine the latitude, 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; MEMSENER is a powerful yet simple software tool for engineers, researchers and students working in the field of Micro Electro Mechanical Systems Dangerous driving 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 project 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.

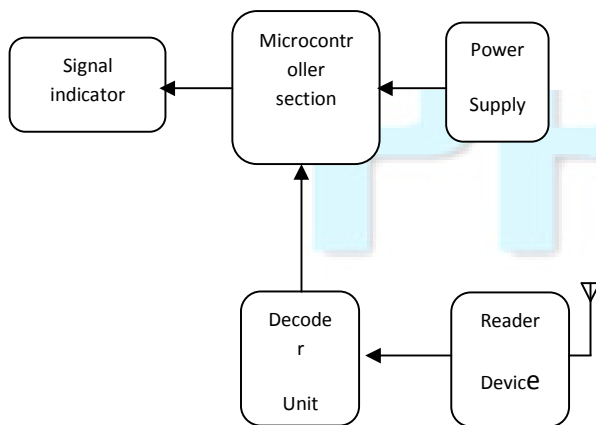
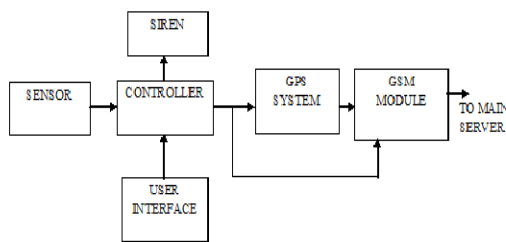
2. Proposed System

In the proposed system the emergency vehicle could be reached without any interruption at the traffic signal. Signal is controlled by the transmitter in the ambulance and received by the receiver at the traffic light. The accident path can be identified by this system.

A. Block Diagram of Ambulance Unit



VEHICLE UNIT:



3. System Implementation

The system consists of three main units, which communicates each other and reaches in time to the hospital without any time delay. They are

Vehicle unit

In the vehicle the vehicle senses the accident spot and sends the location of the accident to the main server. The main server finds the nearest ambulance to the accident spot and also the shortest path between the ambulance, accident spot and the nearest hospital. Then the server send a message to the ambulance by path. Also using this information the server controls all the nodes in the path of ambulance and make it ON, which ensures that the ambulance reaches the hospital without delay. The architecture of this system is shown in the figure.

Ambulance unit

An Ambulance unit contains list of free and busy ambulances at that time.

A Traffic unit consists of database – The Main Server allocates a unique ID for each node and has a database to containing all the nodes’ IDs, GSM numbers and their GPS co ordinates.

A Hospital database containing their locations (GPS coordinates) with their GSM number.

Signal unit/Traffic unit

A Traffic unit consists of database – The Main Server allocates a unique ID for each node and has a database to containing all the nodes’ IDs, GSM numbers and their GPS.

Server unit

The main server is the central brain of our ITS. It communicates as well as controls every part of the system [3]. The server objectives can be mainly classified into:

- Finding the nearest ambulance to the accident spot

- Sending co-ordinates to the ambulance
- Controlling the nodes in the shortest path

3. Result

Advanced Ambulance Rescue System with Prioritized Traffic Switching System by prioritized switching and their results are

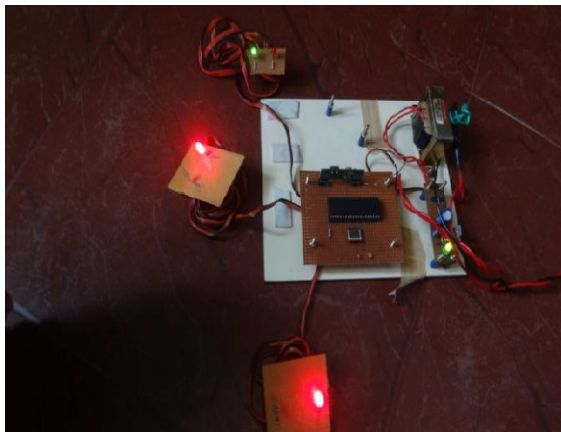
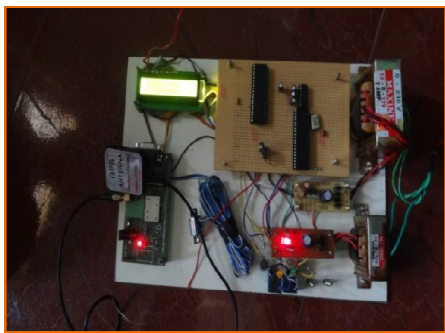


Fig. traffic junction unit

The above diagram shows that traffic signal junction with the three way lane model. This unit contains a RF receiver which will work at 430MHz. The junction operates when the data transmitted by the ambulance unit. The details received by the RF receiver at the rate of 3kbps.



4. Conclusion

In this project an advanced idea is proposed for controlling the traffic signals in favor of ambulances during the accidents. With this system the ambulance can reach the accident spot to the hospital without time lag. The AARS can be an effective system to control not only ambulance but also authoritative vehicles. Thus AARS is implemented in countries with large population like INDIA will produce better results. The AARS is more accurate without time delay. But there may be a delay caused due to GSM messages because it is a queue based technique, by giving more priority to the messages communicated through the server

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