Automatic Ambulance Rescue System

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Abstract: The road accident in the present area is increased to greater extent. The loss of human life due to accident must be avoided. Traffic congestion and tidal flow are major facts that cause delay to ambulance. In order to save human life from accidents we introduce a scheme called ITLS (Intelligent Traffic Light system).The main concept behind this scheme is to provide a smooth flow for the emergency vehicles like ambulance to reach the hospitals in time and thus minimizing the delay caused by traffic congestion.

Keyword: Microcontroller, GSM Module, GPS module, Sensors.

I. INTRODUCTION

Conventionally, Wireless-controlled robots use RF circuits, which have the drawbacks of limited working range, limited frequency range and the limited control. Use of a mobile phone for robotic control can overcome these limitations. It provides the advantage of robust control, working range as large as the coverage area of the service provider, no interference with other controllers and up to twelve controls.

Although the appearance and the capabilities of robots vary vastly, all robots share the features of a mechanical, movable structure under some form of control. The Control of robot involves three distinct phases as follows:-
1. Perception
2. Processing 3.Action generally, the preceptors are sensors mounted on the robot, processing
Is done by the on-board microcontroller or processor, and the task is performed using

Motors or with some other actuators. Robot is designed to detect landmines in a remotely controlled way. User can navigate the robot and locate the landmines. Locations of detected landmines can also be accessed by mobile phones via SMS. The robot can be controlled by the developed software, which will program the parallel port and communicate with the robot via radio signals. Developed software program uses button and mouse control to navigate the robot. The developed software will indicate the real-time location of the robot and the location is transmitted. When the robot detects a landmine it sends the signal to the GSM system in the form of the type of metal detected and their location in such as Latitude, Longitude, the robotic model.

II. LITERATURE SURVEY

Previous work on home vital signs monitors can be seen in the current models that are in hospitals and homes. There are many different types and brands of vital signs monitors available today. They range in size, function, and price. Most are very expensive, costing patients or healthcare providers upwards of $2,500 per system There are many different types of vital signs monitors, so many patents of vital signs monitors exist. One such patent is a blood pressure and heart rate monitoring method and apparatus by Hewitt. This system uses an auscultatory transducer

and a microprocessor-based circuit to record blood pressure and heart rate. It also uses a new method to measure blood pressure without unnecessary constriction of the patient's limb. So far in the market only the devices measuring different parameters are available, which are all stationary, but we are putting efforts to send this information wirelessly over the long distance using GSM unit.

The centralized location and navigation systems make use of communications networks, host facilities, and other infrastructures with the on-board vehicle equipment to locate and navigate to search the victim location. K. Athavan proposed a system, AARS to control the traffic signals to pass the ambulances if the accidents occur. The AARS can also be used to monitor the passing notifications of the commanding vehicles. V. O. Matthews, et.al. Designed a platform for emergency rescue in case of an auto crash and developed a prototype named as VAAL. They used the M2M technologies and GPS/GSM module, which operates usually under M2M platform. The communicating devices without human interface come under M2M. V. Gaud, et.al. Proposed a system, called as ARM.

The controller processes the signal, as received and sends the message using GSM module. The system is integrated with the positioning .e. GPS systems. A. Kushwaha, et.al. Designed the accident alarm system, AAS. It is totally integrated with the hardware and software modules including navigation systems. Whenever the sensor gets the signal, the acknowledgement will be obtained from GSM modem to specified mobile numbers stored in EEPROM, without making any delay. The accident location can be exactly achieved, if the system is installed in the vehicles. Y. Zhao discussed various technologies such as TOA (Time of Arrival), TDOA (Time Difference ao Arrival), and assisted-GPS solutions, which are the topmost competing communication systems nowadays. He also suggested the implementation of these systems in the mobile phone can improve the safety in the transportation, also for tracing the locations. He also proposed a mayday system. It makes use of a cellular phone for voice and data communications, a global positioning system (GPS) receiver for location tracing. S. Sonika, et.al. proposed a

system to block a vehicle by passing a message, and only a authorized person unlock using security code, and helps the victim.

III. DESCRIPTION

Vehicle section:-
The vehicle unit installed in the vehicle senses the accident and sends the location of the accident to the controller. According to our system, every vehicle should have a vehicle unit. The vehicle unit consists of a vibration sensor, controller, siren, a user interface, GPS system and a GSM module. The vibration sensor used in the vehicle will continuously sense for any large scale vibration in the vehicle. The sensed data is given to the controller GPS SYSTEM inside the vehicle.

Ambulance section:-
The controller finds the nearest ambulance to the accident spot and also the shortest path between the ambulance, accident spot and the nearest hospital. The controller then sends this path to the ambulance. Also using this information the controller controls all the traffic signals in the path of ambulance and makes it ready to provide free path to ambulance, which ensures that the ambulance reaches the hospital without delay. At the same time, the ambulance unit turns ON the RF transmitter. This will lead to communicate with the traffic section. In control section GSM modem receives message about accident and send it to PC. PC identifies the nearest ambulance and ambulance is instructed to pick up the patient. Control section transmits the control signal to all the signals in between ambulance and vehicle by RF transmission.

Traffic section:-
Whenever traffic signal section receives the information about accident, the RF receiver in this section is turned ON to search for ambulance nearing the traffic signal. Whenever the ambulance reaches near to the traffic signal(approximately 100m), the traffic signal will be made to green through RF communication. Thereby the ambulance is recommended to reach the hospital in time
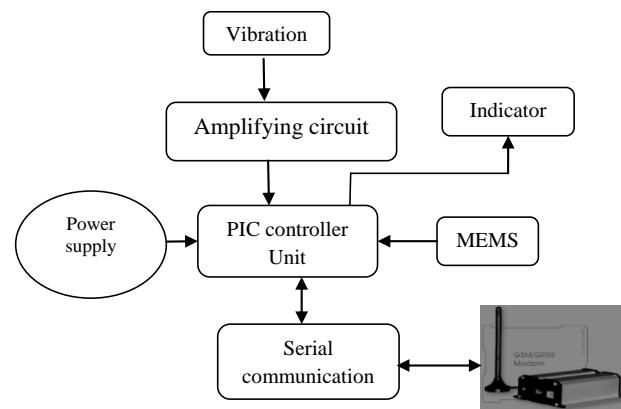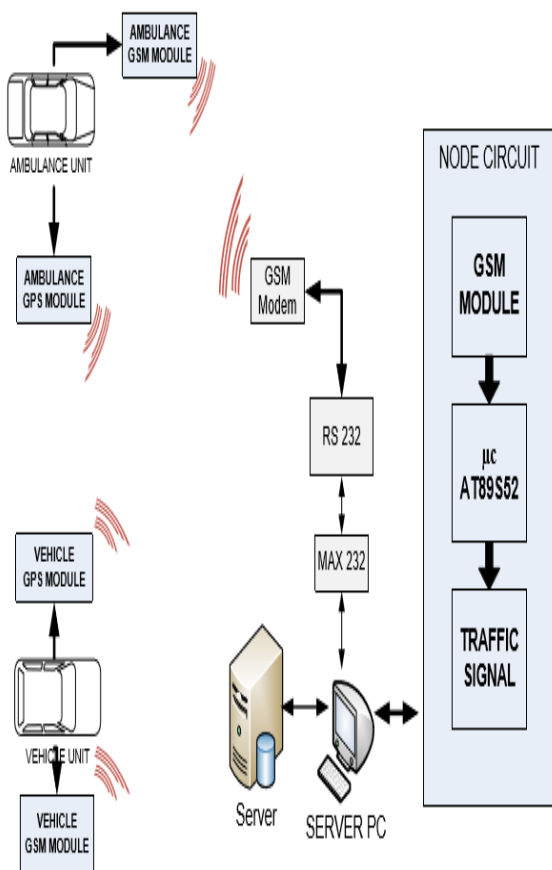
Components List-
* PIC16F877.
* GPS Receiver with Antenna.
* GSM Modem.
* Microcontroller 8051.
* RF module
* LCD.

Software's Used-
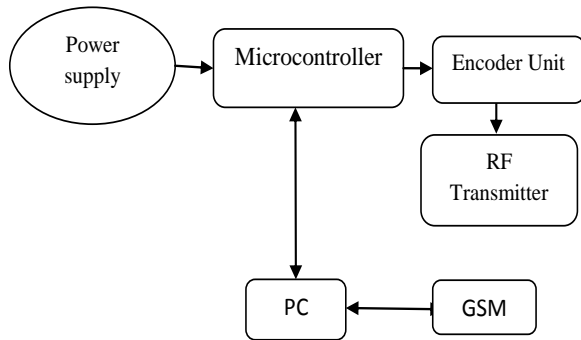* Proteus 6.
* Keil Micro Vision 4.
* MPLAB.

IV. WORKING

Our system consists of four main units, which coordinates with each other and makes sure that
Ambulance reaches the hospital without any time lag. Thus our system is divided into following four units,
The Vehicle Unit
The Main Server
The Ambulance Unit
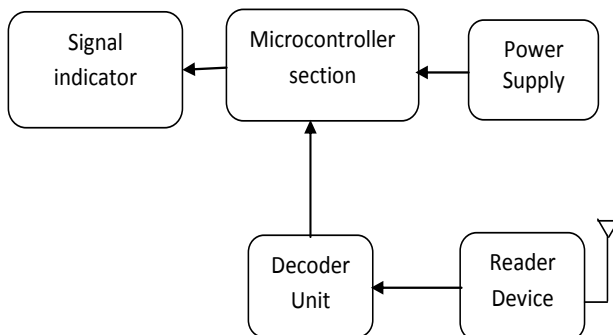The Node Circuit (Traffic Junction Unit).

The vehicle unit installed in the vehicle senses the accident 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 then nearest hospital. The server then sends this path to the ambulance. 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 main server is the central brain of our ITS. It communicates as well as controls every part of the system. 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.

The ambulance unit has a GPS SYSTEM and a GSM MODEM for transmitting GPS data to the Main Server. The server receives the GPS data sent by the ambulance at lard intervals of time. The server sends the coordinates of all the nodes' in the path to the ambulance. The last two nodes (Xn-1, Yn-1) and (Xn,Yn) will indicate the accident location and the hospital location respectively. The ambulance unit on receiving the co-ordinates plots them on to a map with the last two coordinates as the accident spot and the hospital location to get the shortest path to the hospital makes the junction to work in ambulance mode.When the ambulance crosses the junction it again sends a signal (STOP signal) to the junction which again comes back to the normal mode. The Table1 shows the range of GPS values of 1km marking and the traffic signal node which is stored in the ambulance unit's controller and compared with its location continuously.

Whenever traffic signal section receives the information about accident, the RF receiver in this section is turned ON to search for ambulance nearing the traffic signal. Whenever the ambulance reaches near to the traffic signal(approximately 100m), the traffic signal will be made to green through RF communication. Thereby the ambulance is recommended to reach the hospital in time.

V. ADVANTAGES

- Totally Advanced version of Ambulance system.
- With the help of GPS we get the latitude and longitude of the detected position.
- When we get exact location of vehicle the ambulance will reach there in a few minutes
- The ambulance would be able to cross all the traffic junctions without waiting..
- This scheme is fully automated, thus it finds the accident spot, controls the traffic lights, helping to reach the hospital in time.

VI. APPLICATIONS

- Anti-theft systems
- Crash recorders
- Dead reckoning
- Bio-medical applications

VII. CONCLUSION

The paper presents an advanced solution and a new direct approach for remote sensing based on the concept of metal detectors to detect the metallic landmines in El Alamein region. The advanced solution solves three main problems a) The absence of maps that show landmines locations that planted in the Egyptian western desert from WWII, b) The lack of funds, c) The limited use of technology. The solution based on integrated technologies by using the wireless communications, cellular technologies and the packet oriented mobile data service to obtain a full control from a safe distance for landmine monitoring team in fenced minefields or suspicious regions. GSM sound tracker, GPS tracker, smart cellphones plus advanced applications and RC truck equipment were brought together to do three main tasks for metal landmines, a) Tracing,-b) Detecting,-c) pinpoint location coordinates.

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