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# Intelligent Ambulance Using Gps

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## Abstract

The whole system was developed for providing the first aid facility to the patient in case of an emergency. This is basically an application which can be installed easily, this provides an interface between people and the emergency unit where the people can efficiently use the emergency unit in case of emergency. Once the accident is spotted one who accesses the application can view the nearby hospital within the km from the accident spot, which will help the victim to reach the hospital nearby without any inconvenience. Once the emergency unit is reported about the accident the ambulance reaches the accident spot on the way to the spot of accident or to the hospital, the ambulance may or may not struck in traffic jam. As we are living in a society with massive population and heavily crowded road, so to overcome the traffic jams and to take the patient to the hospital as early as possible this system helps a lot. Once the accident is spotted, identified and conformed an alert to the upcoming traffic signal enroute to the hospital or to the accident spot will be sent. Now the signals in the route will be continuously receiving the position coordinates of the ambulance's the ambulance approaches the signal the incoming ambulance will be reported by the signal. The traffic lights convert s its light pattern once the ambulance reaches the signal. Similarly the entire signal in the root will be cleared. By this way the ambulance can get the free way to reach the hospital.

Index Terms:GPS,3D,GSM,SMS,NMEA

## I.INTRODUCTION

### IMPORTANCE OF THIS SYSTEM

We know that Ambulance Services are important for Health & Medical facilities. The solution is to build application similar to Ola / cab services. But it will be for Ambulance services. This app will have Ambulance driver's register their availability and location. Both Executive at Emergency Helpline and User's on the other hand on App's Client interface will book an ambulance. This will promise a fast and reliable ambulance service in case of emergency

### NEED FOR INTELIGENT AMBULANCES

The largest population and large amount of vehicle .There is also a big trouble of road accident and with these overcrowded roads there is a problem of first aid service still which remains as unsolved problem. To overcome this delay this project describes the solution that is "Inteligent Ambulance", which includes automatic traffic light control system with GPS technique such that the ambulance can achieve a free way in order to provide the first aid to patient as fast as possible. Here there is additional feature called the patient monitoring system which monitors the patient's health parameter which include body temperature, blood rate, etc. These parameters and the hospital server will recive the data for further treatement. This all leads to better outcomes and saving. On road due to high and intense traffic the free way to the emergency unit can not be provided which also become one of the important factors of delay in the first aid due to which many may die on the way to hospital .so in order to overcome the negative factors this system is proposed .This project describes the working in detection of accident and the emergency ambulance unit will be immediately alerted about the details of the accident with location coordinates. Receiving such coordinates the ambulance unit will respond immediately and leave for the accident location. Now in order to free the traffic and clear the signal the intelligence ambulance control the traffic lights itself such that the traffic light converts in a manner so that it could receive the free way without being caught on the way to the hospital.

## **II. TRAFFIC SIGNALS**

We know that, initially traffic lights were controlled manually by switches installed in a switch box in each intersection. Long ago a policeman was in charge of changing the lights as needed. Many modern traffic light systems still have the manual operation capability for manual control of the control signals. In this system policemen did not have to stand in the middle of intersection to control the traffic. After that mechanical timers and electrical clocks were added to automate the operation of traffic lights in an easy manner. A timer clock decides the times how long a light should stay a specific color. Modern traffic lights control is completely depends on the amount of traffic on a certain road. This is done by either putting magnets on the road, or on any other vehicle. On the other side of the street is a bunch of sensors that calculate the amount of cars that pass over a specific time. These sensors send a signal to the light to adjust it's timing depending on the amount of traffic. Figure 1 shows how an intelligent ambulance system works.

Traffic responsive controllers change the lights, which depends on how much traffic amount if present in each direction. These controllers sometimes make use of the sensors (inductive loops in the roadway) to detect the number of vehicles and thus automatically adjust or change the length of the green time to allow as much as number of vehicles as possible through the intersection before responding to the vehicles present on another side. Although these types of traffic controllers are being used for many years, a new generation of

"Microcomputer Traffic Controller" becomes very much efficient, thereby reducing delays of time-consuming.

Fig1: Intelligent Ambulance System

### **III. GPS**

Global Positioning System plays the major role in the society to show one's position on the earth any point of time in any kind of weather, anywhere. The below content is about the satellite based navigation at length. We know that GPS consist of different segment like space segment, control segment, user segment. Here we also briefly discussed about how the GPS works and its efficient.

#### **GPS ROLE**

The Global Positioning System is kind of a navigation system which is completely based on satellite. GPS consist of 24 orbiting satellite. These satellites makes about two circuits around the earth for every 24 hours.

Information of three bits are transmitted through these satellites. They are , the satellite's number, its correct space position and the accurate time the information is being sent. the GPS receiver receives these signals, which are used for the calculation of the distance between the GPS receiver and GPS satellite.

GPS receiver receives the signal from three or more GPS satellite. These signals are used to

triangulate its location on the ground. Here it can able to determine the 3D position and added to that it provides data in the speed and of your travel direction . Anyone with a GPS receiver are allowed or can access the system.GPS provide the navigation, three-dimensional positioning, real-time and timing of 24 hours in a day,7 days of a week, world wide ,it is used in various application, including mapping, surveying and collection of data.

### GPS WORKING:

The GPS principle is to measure the distance between the receiver and the satellites. The satellite also explain exactly about their position in the orbit above the earth. Here four satellite are needed to calculate the four dimensions of A,B,C(position) and time.GPS are receiver are used for positioning, navigation, etc..single revolution around the earth in space is equal to one single orbit. Each satellite takes 12 hours to complete one revolution. Each satellite is attached with an clock which is accurate to let it broadcast signals which is accomplished with a small and precise time message. These signals are travel with the speed of light and finally received by the ground unit.These signals takes a measurable time amount in order to reach the receiver. The difference in the time at which the signal is being sent and received is multiplied with the light's speed, which helps the receiver in calculating the distance to the satellite. To measure the altitude, longitude and latitude the receiver measures the time it took for the signal to reach the receiver from four separate satellite. The below figure depicts the working of gps system.

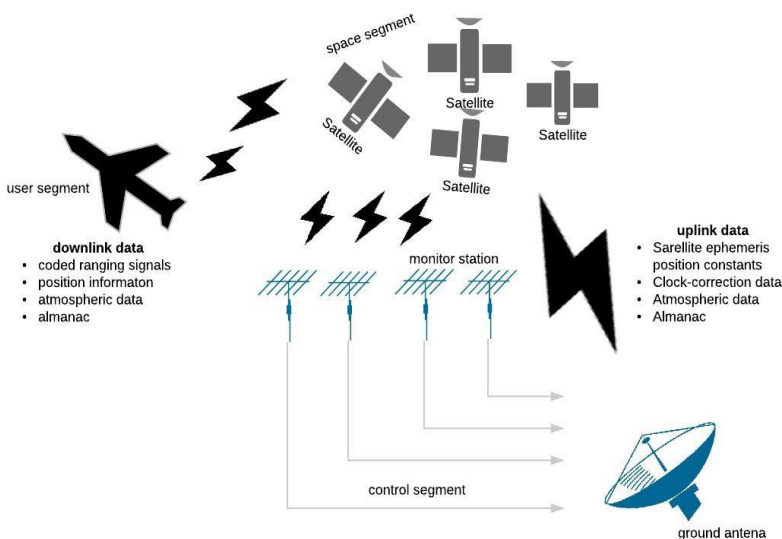


Fig 2: GPS working System  
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## **VEHICLE TRACKING MECHANISM:**

GPS vehicle tracking system are introduced in order to give solution of vehicle tracking system. This system use GPS(Global Positioning System) module and Short Message Service(SMS). It consist of "Mobile Unit" which include GPS module, microcontroller and GSM (Global Systems For Mobile Communication) modem.It also consist of "BASE STATION" which include modem and display unit. The purpose of GPS modem is to collect the vehicle's information about the location ,GSM modem is to sent SMS to the modem that placed in the base station. The code to be executed will be uploaded to microcontroller which guide the GPS module and GSM function of modem. After the modem in the base station has received the message which provide the information about the vehicle's location that creates an application and installs it on the display unit. this display unit display the location of vehicle location on "Google Earth". Mobile unit are used by C programming language and base station are by C# programming language.

## **IV SMART AMBULANCE**

Traffic jams is one of the major issue in India due to which the ambulance services are affected a lot. Due to the delay in ambulance service, patients may lose their life and number of these incident are getting increased day by day. The patient must need to get treatment on time according to the 'Green Corridor' concept. Smart ambulance are provided with blood pressure ,heart rate sensor, etc..The status of this parameters will be sent to hospital's database simultaneously traffic signals will be operated by using GPS tracking through which the location of the ambulance are identified according to the location the traffic signal get changed. After getting status of the patient condition the hospital authorities will plan accordingly.

## **V STACK IMPLEMENTATION**

Global positioning system receivers play a major role to find the accurate location of one's position. The distance between two locations on earth can be easily measured by using stand alone GPS receiver. The aim of this project is to implement and design a low cost Global Positioning System suitable to be used for sailing, hiking and climbing activities. The main function of the GPS is to locate the position of user accurately. PIC18F4520 hardware is used in this project which is integrated with GPS receiver typed FV-M8. The GPS modules will generate the coordinates of altitude, lattitude and longitude. PIC-C Compiler is used to develop the algorithm to calculate the distance between two positions . The GPS receiver sent the data via RS232 (point-to-point) communication. The NMEA data sentences is parsed by Microcontroller and execute the algorithm. LCD display unit is used to display the output. System testing conducted showed that for a few chosen different locations, weather condition

and geographical position .Compared with ideal theoretical result ,the overall result gives an average of 10% difference.

### **PICS18F4520**

1)RISC architecture is optimized by C Compiler. 2)Up to 10 MIPS Performance at 3V.

3)Internal oscillator support about 31 kHz to 8MHz along with 4xPLL. 4)8x8 Single Cycle Hardware Multiply is used.[5]

### **FV-M8**

Most commonly used low cost GPS module is FV-M8.

1)It uses only 3.3V.

2)It is robust in nature.

3)It is small as well as light in weight. 4)It includes built-in antenna.[6]

### **RS232**

RS-232 is used for serial communication in transmitting data. It connects signals between DTE(data terminal equipment),and DCE(data circuit terminating equipment or data communication equipment),like that of a modem. RS-232 is widely used in computer serial ports.RS-232,when it is compared to other later interfaces such as RS-422,RS-485 and Ethernet, as it has low transmission speed, cable length which is short and maximum, large voltage swing, large standard connectors and limited multidrop capability[2]

### **PIC C-Compiler**

PIC-C-comipler is used to optimize the code.

Compiler easily migrate between microchip.

you can write code on your microchip(used to transfer electrical signal) which can be migrated easily to another microchip via compiler.[1]

### **NMEA**

NMEA is a data specification and combined electrical for communication between marine electronics such as GPS receiver etc. National Marine Electronics Association, which define and control the NMEA.[3]

## **VI ADVANTAGE**

- 1) With this system the ambulance can be maneuvered from the accident spot to the hospital without time lag.
- 2) To provide the smooth flow for the ambulance to reach the hospital in time and thus minimize the problem.
- 3) The idea behind this scheme is to implement an intelligent transport system (ITS) which would control mechanically the traffic light in the path of the ambulance.
- 4) This scheme is fully automated, thus it finds the accident spot, control the traffic light.

## **VII SHOW-STOPPERS**

- 1) This app may not be efficient in case where the signals are cleared manually.
- 2) May disturb regular routine of common man.
- 3) When 3 or more ambulances arrive at the same or similar time to the signal complexity may arise

## **VIII CONCLUSION**

In this paper a new system is introduced to overcome the delay faced by ambulance services due to traffic congestion. Simultaneously the health parameters of the patient are sent to the corresponding nearby hospital which helps the hospital authority to make prior arrangement for further and quick treatment. In this paper identifying the nearer ambulance services, preventing ambulance services from traffic congestion are achieved. This paper explains the simplest implementation method of easily accessing the emergency ambulance unit. Each and every vehicle which communicates with the traffic signals are maintained in a secured manner, since only the ambulances that are properly registered with the hospitals can access this. When more than one ambulance are about to access the service at the same time priority is given to the nearer ambulance. A possible rerouting feature can be added based on traffic density for establishing communication between ambulance and signal port via GPS.

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