Green Corridor for Ambulance

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***Abstract*— With the current traffic scenario, the ambulance service gets adversely affected. This paper explains a system that makes a green corridor for ambulance, which enables the ambulance to pass without any obstacle. The main purpose of this idea is to solve the problem of ambulances reaching late either at an accident spot or at the hospital. This happens mainly due to traffic jams at various places for multiple reasons. We mainly aim at solving this problem for the community. The idea is implemented using the GPS and GSM technology .The location of the vehicle and ambulance are found out using the GPS technology and sent to the server using GSM .The server is a GSM module which calculates the relative position of the two and signals the vehicle to make way for ambulance when it is in proximity to the vehicle. The idea is implemented using SIM 808 modules which comprises of both GSM and GPS modules interfaced with PIC16F877A microcontroller.**

***Index Terms*— GPS, GSM, LCD, LED**

1) INTRODUCTION

The world today is developing rapidly. At the same time we face many problems owing to the development. One of the primary issues encountered are traffic jams. These jams paralyze the transport services of the country. One such essential service that gets affected is the ambulance service. A delay in reaching the spot of accident or the hospital may cost a patient his life. To overcome such life-threatening situations, the idea of Green Corridor for Ambulance is developed.

We have implemented a system that notifies other vehicles to clear the way. The system calculates the relative position of the ambulance and the vehicle by sharing the position (calculated using GPS) of the two using GSM technology. The main idea for this implementation is to minimize the delay caused by traffic congestion for emergency vehicles and save time and lives.

2) LITERATURE SURVEY

Technology has entered almost every field of our life, but still we see numerous cases where ambulances are unable to reach on time. There have been studies in the past about the same. [1], [2], [3].

The current systems use the RFID technology. It determines the traffic density on a path. An automatic traffic junction unit has been developed. It determines the path with least traffic density. [1].

Also, there is another system where a green lights path is provided an emergency vehicle by changing all traffic signals.

This provides clearance to emergency vehicles by providing a green wave-a synchronization of green phase of signals. [3]

We have used GPS and GSM technology since all the vehicles these days are equipped with GPS.

3) TECHNOLOGY AND COMPONENTS USED

a) GPS Technology

The global positioning system is a technical marvel made possible by a group of satellites in Earth's orbit. It transmits precise signals, allowing GPS receivers to calculate and display location, speed and time information to user. It gives the location i.e. Latitude and Longitude of any particular place. The GPS operates independently and does not require any internet or telephonic reception. The concept of GPS is based on known position of satellites as well as time.

b) GSM Technology

The Global System for Mobile Communication is a mobile communication modem. It is the most popular standard for mobiles across the world. Some of the features of GSM are:

i. Better Spectrum Efficiency
ii. International Roaming
iii. Real-time clock
iv. Short Message Service
v. Security

c) SIM 808 Module

SIM 808 module is a GSM and GPS two-in-one function module. It is controlled through UART using AT commands. It constitutes a charging circuit for Li-ion batteries and has very low power consumption in sleep mode.

It has high GPS receive sensitivity with 22 tracking and 66 acquisition receiver channels. Besides, it also supports A-GPS that available for indoor localization. A standard SIM card is used for the GSM function.

d) PIC16F877A

The PIC16F877A is amongst the most popular microcontrollers in the industry. It uses FLASH memory and hence can be re-written multiple times. Out of the 40 pins, 33 pins are for input/output functions. Some permanent information such as transmitter codes and receiver frequency can be stored owing to an EEPROM incorporated in the device. The handling of this controller is easy and the cost is also low.

e) 16X2 LCD:

This LCD is used for displaying data. It consists of 2 rows and 16 characters per row. It can thus display 32 characters at a time.

4) Experimental Setup

The setup for the demonstration consists of two models: One model acts as a user vehicle. The other model acts as an ambulance.
Both the models are equipped with PIC16F877A microcontroller. This controller acts as the primary interface between the SIM808 and the LCD, i.e. Between the GPS, GSM and the user display.
Also, these models comprise of SIM808 modules. They are used for communication with the server. They determine the GPS co-ordinates and share it with the server.
The server is a mobile phone consisting of a SIM card for GSM.
For demonstration purpose, these modules get their supply from a regulated power supply. These modules have also been tested by connecting directly to battery of a vehicle. The setup works on 12V DC supply.

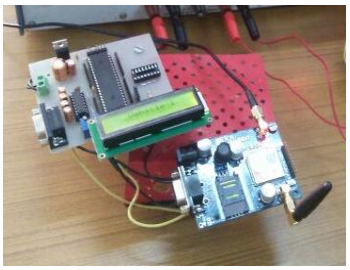

Fig.1. User Vehicle

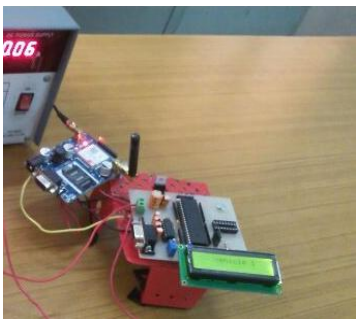

Fig.2. Ambulance

5) Methodology

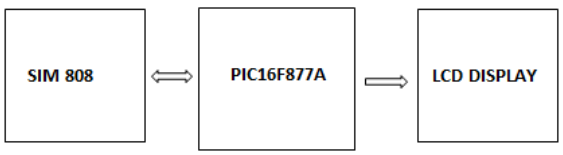

Fig.3. Block Diagram

The working of this system through SIM808 is very simple. Once it is switched on, all the components and their functions are initialized-i.e.-LCD initialization, GPS initialization, GSM initialization for message events.

For demonstration purpose, a mobile phone acts as a server. This server is used for all communication with the users.
The GPS in the SIM 808 module determines location of the user vehicle and the ambulance.
The GSM in SIM808 shares the data continuously with the server. Parallely the co-ordinates are displayed on the LCD.
Once the user vehicle is in the path of the ambulance, the server sends a message to the user to make way for ambulance.
The data is shared with the server every 30 seconds.

6) Conclusion

In this implementation we have used highly advanced technology components GPS and GSM. Considering the real time scenario this system has been implemented by adding an actual GPS navigation and GSM system for an optimized clearance of path.

7) Future Scope

This implementation can be further enhanced by using Internet of Things (IoT). The location of the ambulance and user vehicle can be shown on a real time basis on maps using GPS co-ordinates.

8) Results

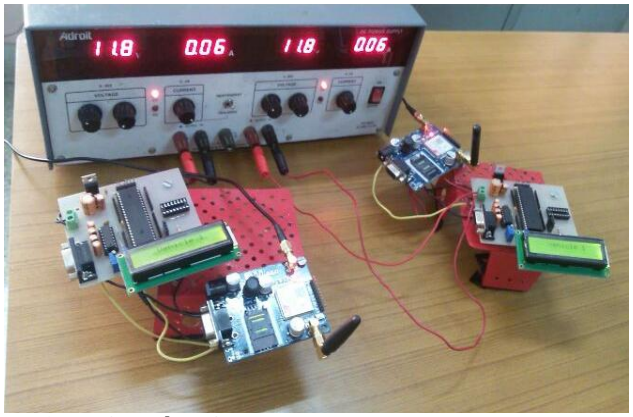

Fig.4. Complete Setup

Fig.4.Initialisation of system

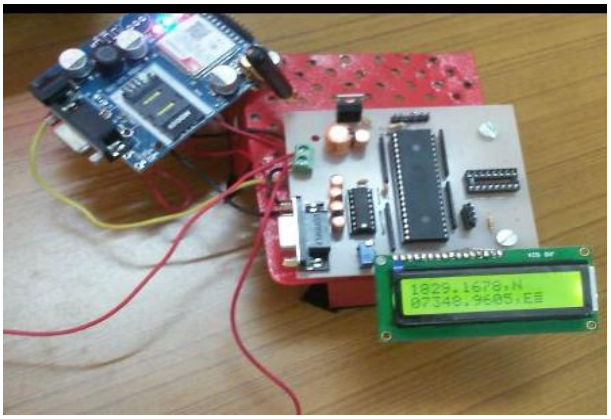

Fig.5. GPS Co-ordinates of Ambulance

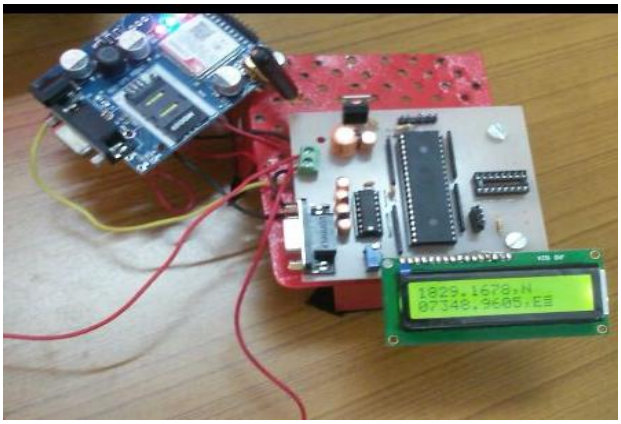

Fig.6. GPS Co-ordinates of User Vehicle

Fig.7. Clear Road for Ambulance

9) REFERENCES

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