Intelligent Traffic Control for Ambulance

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ABSTRACT: The proposed system aids to free the traffic jamming by making red lights to green of all the traffic signals on the path of the ambulance, henceforth aiding in clearance of the traffic and providing way towards its destination. The system entails of an android application which registers the medical vehicles on its network. In case of emergency situation, application user can send emergency alert to nearby hospital through server. Server has to send ambulance location to signal control system for traffic controlling. After that nearest signal is recognized based upon the current location of the ambulance which is fetched through GPS and specific signal is made green till the ambulance passes by and later it regains its original flow of control. Application user has provided a facility of adding first aid details in application which will be send on hospital server for superior treatments. In this way it acts like a lifesaver project as it saves time in emergency by controlling the traffic lights.

Keyword—Traffic Signal, GPS Module, Controller, Ambulance.

I. INTRODUCTION

The rapid development of IoT technology makes it possible for connecting various objects such as sensors connecting through the internet and providing more data interoperability methods for application purpose. The Internet of Things (IoT) is the interconnection of uniquely identifiable embedded computing devices within the existing Internet infrastructure. Emergency service should be provided correctly at the needed time. He/she should be taken to the hospital as earlier as possible and treatment as to carry out fast to save his/her life. This project is mainly based on communication between ambulance and various devices such as mobile phones, hospital computers and traffic signals so that the possibility for saving the life of the needy person will get increased.

These days with the increase in the population and due to luxurious living there is an increase in the traffic on roads. Amidst all these frenzied life, one forgets the importance of human life. This is a very serious problem even in case of road accident one even doesn't care to call the emergency unit. On road due to high traffic people are unable to provide the freeway to the emergency unit which also becomes one of the factors of late first aid to the patient due to which one can die on the way to hospital.

So to overcome their negative factors and to provide the first aid to the victim this system -"Intelligent Ambulance with automatic traffic control" is proposed in this paper. This paper describes the working of accident detection and immediately alerting the emergency ambulance unit about the accident with the location co-ordinates, receiving such co-ordinates the ambulance unit or so called emergency unit respond immediately and leaves for the accident location now while moving toward the location or while taking the patient to the hospital there may or may not occur some traffic so in order to free or release the traffic the intelligent ambulance controls the traffic light itself such that the traffic light converts in a manner so that it could receive the freeway to the hospital. Intelligent ambulance also have some extra features such as while in the way to hospital before providing the first aid to the patient one can detect the patient health status like monitoring the fever or pulse rate so that the patient can get the correct first aid treatment and can save his life.

II. PROBLEM STATEMENT

The design and implementation of this technique is directly targeted for traffic management so that emergency vehicle on road gets clear way to reach their destination in less time and without any human interruption.

III. LITERATURE REVIEW

Implementing Intelligent Traffic Control System for Congestion Control, Ambulance Clearance, and Stolen Vehicle Detection[1] paper proposed an Intelligent Traffic Control for Congestion, Ambulance clearance, and Stolen Vehicle Detection. This system was implemented based on present criteria that tracking three conditions in those one is heavy traffic control and another one is making a root of emergency vehicle like ambulance and VIP vehicle. As the entire system is automated, it requires very less human intervention. With stolen vehicle detection possible junctions. Emergency vehicles need to reach their destinations at the earliest. If they spend a lot of time in traffic jams. With emergency vehicle clearance, the traffic signal turns to green as long as the emergency vehicle is waiting in the traffic junction. The signal turns to red, only after the emergency vehicle passes through**.**

Design of Intelligent Ambulance and Traffic Control[2] This paper represents the unique feature which is very useful to ambulance drivers to take an alternate route in case of congestion. The various performance evaluation criteria are average waiting time, average distance travelled by vehicles, switching frequency of green light at a junction, efficient emergency mode operation and satisfactory operation of SMS using GSM Mobile. It is observed that the proposed Intelligent Traffic Light Controller is more efficient than the conventional controller in respect of less waiting time, more distance travelled by average vehicles and efficient operation during emergency mode and GSM interface.

Poonam Gupta, Avanti Pati proposed Smart Ambulance System[3] this paper illustrates about revolutionary development

in the field of Internet of Things (IoT) and how it can be seamlessly & widely in large number of end system where subset of a large amount of data can be accessed and processed easily and powerfully user sends requested to server regarding the required service i.e. either hospital information or ambulance details. The second module is used to send live information about the patient's health to the desired hospital selected by the user. Using various smart devices support enabled hardware components, the readings will be recorded by the system which will be available inside the ambulance. The app will send the data in the form of live feeds so that hospital management can make necessary prerequisites till patient reaches the hospital. It is said that treatment given while taking patient from source place till hospital is most crucial in case of any heart related problem and emergency. Thus Hospital administrative person can guide which actions should be taken until patient it reaches hospital.

Authors S. Chandrakanth Sagar, Dr. M. Narayana have discovered paper Ambulance Controlled Traffic System Using RFID Technology with LabVIEW Simulation[4] The emphasis in this project is given for clearance of the traffic signal whenever ambulance reaches near to traffic signal. This can be achieved by RFID technology and hence an efficient ambulance controlled traffic system using RFID technology with LabVIEW simulation is proposed. Radio frequency identification is a technique that uses the radio waves to identify the object uniquely. RFID technique is widely used in the various application areas like medical science, commerce, security, Electronic toll collection system, access control etc.

The main concern of this system is that allowing an ambulance to arrive at a particular location without it having to stop anywhere until the destination is reached. This project includes the LabVIEW simulation. The operation which is performed on the hardware circuit is similarly observed on front panel of the LabVIEW.

In Automated Emergency System in Ambulance to Control Traffic Signals using IoT[5] authors Dr. A. Balamurugan, G. Navin Siva Kumar, S. Raj Thilak, P. Selvakumar proposed an idea of control Traffic Signals using IoT. The Internet of Things (IoT) is the interconnection of uniquely identifiable embedded computing devices within the existing Internet infrastructure. Typically, IoT is expected to offer advanced connectivity of devices, systems, and services that goes beyond machine-to-machine communications (M2M) and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects, is expected to usher in automation in nearly all fields, while also enabling advanced applications like a Smart Grid. This project is mainly to provide communication between ambulance and various devices such as traffic signals and computers at hospitals so that the possibility for saving the life of the injured person will get increased.

IV. PROPOSED SYSTEM

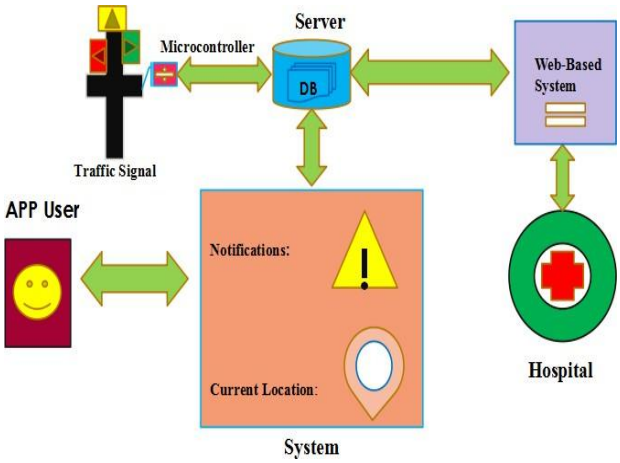

Figure 1: System Architecture

- In proposed system user have to login into the system in emergency situation for authentication purpose.
- After clicking emergency button alert notification will gets generated and that will be send to nearby hospital via server.
- The notification contains current location of user and ambulance number.
- Location of user gets fetched through GPS continuously and gets updated in server's database.
- Database contains latitude and longitude values of each traffic signal as well as driver information.
- Each signal have one microcontroller that will compute the difference between current location of ambulance and static location of signal.

- If the difference value is in between 0 to 500 m then signal will be turned to green.

V. MODULES

a) **Login: -** In our system, user has to login first then current location and user information send to nearest hospital. Only for authentication purpose login is provided.

b) **Medical Web Based Systems :-** Hospital have web based system. Hospital will be connected with traffic controlling system for location update of ambulance. Once hospital receives location of ambulance it will send instructions to traffic signal for manipulation. Hospital will also receive some basic information about patient like first aids information which will be provided in ambulance only.

c) **Emergency Vehicle Controller: -** Ambulance is one of the major modules in our system. In ambulance we will be having one mobile app for location update and for patient information. Once ambulance reaches at emergency spot. Ambulance driver will send location to hospital for traffic signal manipulation. Ambulance will also send some basic information about patient to hospital for better treatment.

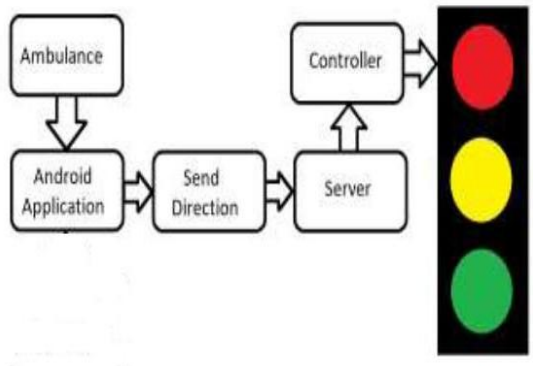

Figure 2: Working of the System

VI. HARDWARE USED

i. Microcontroller

The ESP8266 is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability produced by Shanghai-based Chinese manufacturer Espress if Systems.

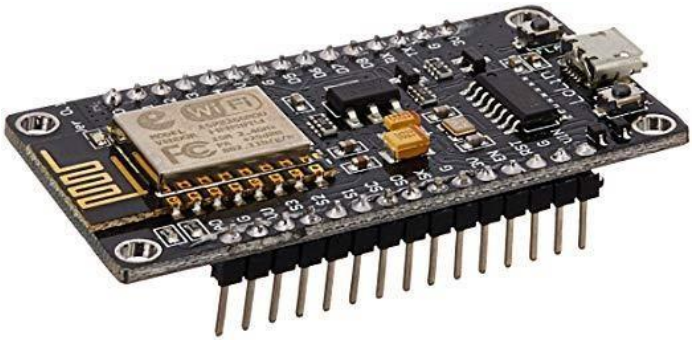

Figure 3: ESP8266 Microcontroller

The chip first came to the attention of western makers in August 2014 with the ESP-01 module, made by a third-party manufacturer Ai-Thinker. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. However, at first there was almost no English-language documentation on the chip and the commands it accepted.

ii. LED

A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. When a current flows through the diode, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence. The color of the light (corresponding to the energy of the photons) is determined by the energy band gap of the semiconductor. White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device**.**

Figure 4: LED

VII. CONCLUSION AND FUTURE SCOPE

Now-a-days accidents have become more common and due to the lack of intimation to the ambulance at the right time there is much loss of life. This work is developed with a main purpose is saving the life of a person. Whenever an accident occurs in a vehicle, the ambulance is automatically intimated without the intervention of human and secondly, the traffic is cleared for the smooth and fast running of the ambulance. And at the same time, the patient's condition inside the ambulance is monitored frequently and the information is updated in a web page, which could be viewed by the doctor at the hospital and make the necessary arrangements.

Same system can be implemented for other emergency vehicles such as fire brigade, police van and VIP vehicles.

VIII. REFERENCES

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