Ambulance Guidance System for Medical Emergency

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Abstract-- Overpopulation is one of the biggest problems in the world today. Speaking about facts, an increase in the number of humans means an increase in the number of cars on roads. Thus, traffic management is a critical issue faced in many metropolitan cities today. There are many problems of congestion with traffic lights in many cities especially for emergency vehicles. Lack of efficient traffic control leads to loss of lives because of ambulance delay in case of getting stuck in traffic jams. In the proposed system the optimization of traffic light controllers using Arduino is developed. The system tries to reduce the possibilities of traffic jams, caused by traffic lights, to an extent and give ease to drivers to avoid congested paths and also informs in prior to hospitals about the severity of the emergency so that they can be ready with necessary requirements.

Keywords—GSM, GPS, DJANGO

I.   INTRODUCTION

These days with the increase in the population and due to passion for luxurious living there is an increase in the traffic on roads. Amidst all these frenzied lives, one forgets the importance of human life. This is a very serious problem even in case of a road accident one even doesn't care to call the emergency unit. On roads due to high traffic people are unable to provide the freeway to the emergency unit which also becomes one of the factors for delay in first aid service to the patient due to which one can die on the way to hospital. So, to overcome these negative factors and to provide the first aid to the victim even on the way to hospital, the system "Ambulance Guidance System for Medical Emergency" is proposed.

The proposed system works based on immediately alerting the emergency ambulance unit about the accident with the location coordinates, receiving such co-ordinates the ambulance unit or so-called emergency unit responds immediately and rushes to the accident location. Now while moving towards 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 signals itself, such that the traffic lights are adjusted in a manner so that it can have the freeway to the hospital. Intelligent ambulances 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's health status like monitoring the fever or pulse rate so that the patient can get the correct first aid treatment and it will also send the information to the nearest hospital with shortest route. Thereby it can save the life of a person.

II.   LITERATURE REVIEW

Varsha Shingade et. al. [1] In this proposed system "Smart Phone Based Enhancement in Health Services Using GPS", In this proposed system it uses GPS to track the location of the victim and GSM to send a message in case of an accident, so that the victim can be taken to hospital and treated as soon as possible.

Jose Anand et. al. [2] In the article, "Emergency Traffic Management for Ambulance using Wireless Communication", proposed a system in which in case of an accident the control room or the rescue team will receive a message using GPS and GSM technology to indicate about the accident.

Farheena Shaikh et. al. [3] In this proposed system, "An Approach towards Traffic Management System using Density Calculation and Emergency Vehicle Alert", proposed a system called Smart Traffic Light Control System that controls the change of traffic lights at intersection points and gives high priority to emergency vehicles and Smart Congestion Avoidance System which chooses the shortest routes to the destination having least congestions.

S. Iyyappan et. al. [4] In this proposed system, "Automatic Accident Detection And Ambulance Rescue with Intelligent Traffic Light System" Using Shortest Path Finding Algorithm is proposed to create a system in which system will place a RF transmitter in the ambulance and RF receiver in the Traffic lights, using Biosensor to detect the condition of patient while travelling and GPS to find out the location of the accident.

III.   PROPOSED SYSTEM

In India, rapid growth of population coupled with a high rate of industrialization has resulted in unmanageable increase in traffic volume, especially in metropolitan cities and urban areas. Due to this increase in traffic density several valuable lives are lost due to delay in receiving medical attention. Road accidents are the most unwanted

thing to happen to a road user, though they happen quite often in India. According to road accidents in India 2019 report, a total of 151 thousand lives were lost. Ambulance unit plays a vital role in saving the lives of the people who are met with an accident.

Figure. 1 Block diagram of working of Ambulance system

Whenever an accident takes place in any particular location. Ambulance staff will be sent there in order to treat the patient and take him to nearest hospital for primary treatment. The GPS tracks the location of the ambulance and it finds the distance between accident point and the nearest hospital. This information will be sent to traffic system.

The Figure. 1 demonstrates the use of a small set of the traffic unit, which will consist of a computing unit that is an Arduino, GSM module and small set of traffic lights. Whenever a message signal is transmitted to a particular GSM module, it will be then sent to Arduino.

In this proposed system there will be additional light included in the traffic unit which is blue light, which indicates there is an ambulance which will be approaching the particular road lane. If any traffic present in the line it will be cleared by the traffic police.

1. Power Supply

A power supply is an electrical device that supplies electric power to an electrical load. The primary function of a power supply is to convert electric current from a source to the correct voltage, current and frequency to power the load. As a result, power supplies are sometimes referred to as electric power converters. Some power supplies are separate standalone pieces of equipment, while others are built into the load appliances that they power.

2. Arduino UNO

Arduino is open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. An Arduino board consists of an Atmel 8- bit AVR microcontroller with complementary components to facilitate programming and incorporation into other circuits. An Arduino microcontroller is also preprogrammed with a boot loader that simplifies uploading of programs to the on-chip ash memory, compared with other devices that typically need an external programmer.

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with AC-to-DC adapter or battery to get started.

3. GSM Module

GSM module is a hardware device that uses GSM mobile telephone technology to provide a data link to a remote network. From the view of the mobile phone network, they are essentially identical to an ordinary mobile phone, including the need for a SIM to identify themselves to the network. GSM modems typically provide TTL-level Serial interfaces to their host. They are usually used as part of an embedded system.
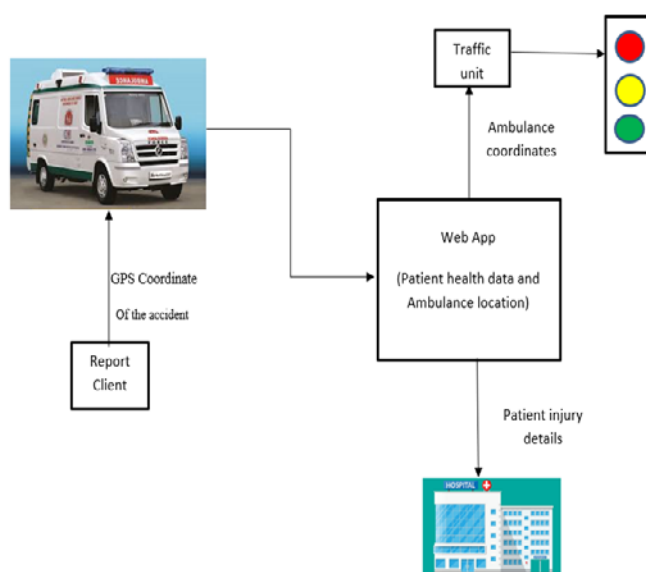
IV.   WORKING PROCESS

Figure. 2 Block diagram of Ambulance guidance system for medical emergencies

In this proposed system when an accident occurs, the person who will be trying to contact the ambulance will be having an app installed in his mobile phone. Once the report is done through the app the ambulance unit will get to know about the coordinate details of the accident spot. Once the ambulance unit reaches the accident spot and the patient enters the ambulance the unit in charge will examine the patient and in the app field medic will fill the type of injuries that has patient has got during the accident. All these details will be sent to the nearest hospital unit so that they could be ready with what is required and the route between the spot of accident and the nearest hospital is mapped and these details will be passed to the nearest traffic unit. The traffic unit will get all the details and check if at that particular route is there any traffic jam.

If any traffic jam is present, it will be cleared. A new light will be included in the traffic light system, if this light is on which

indicates that the ambulance is about to come and if any traffic jam is present then it must be cleared as shown in the Figure 2. Figure.3 shows the Methodology of proposed system.
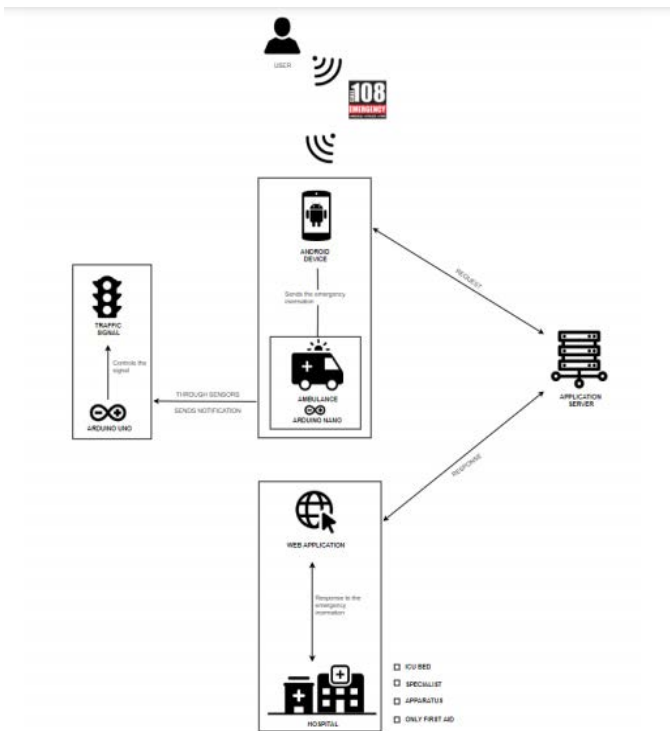

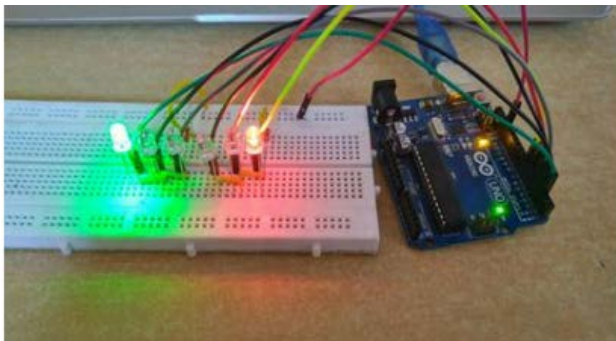Figure.3 Methodology of proposed system

Figure. 4 Hardware implementation

Figure.4 shows the Hardware implementation of the proposed system. Software Tools used in this proposed system to develop a Web application is DJANGO. Django is a high-level Python Web framework. It's free and open source. Figure.5,figure 6 and Figure 7 shows the Software implementation of the proposed system.
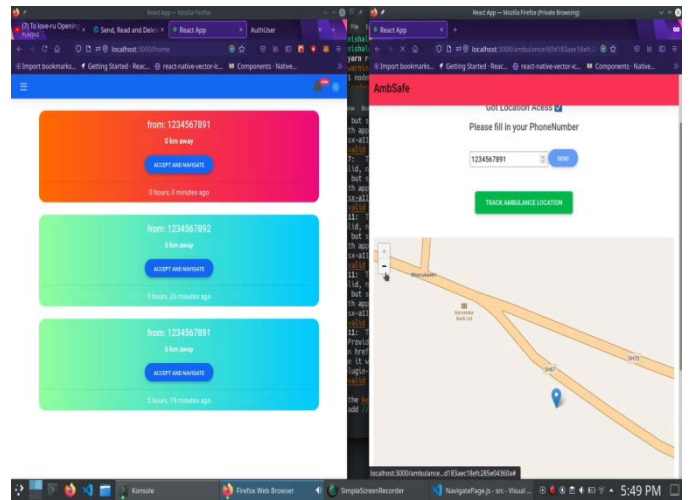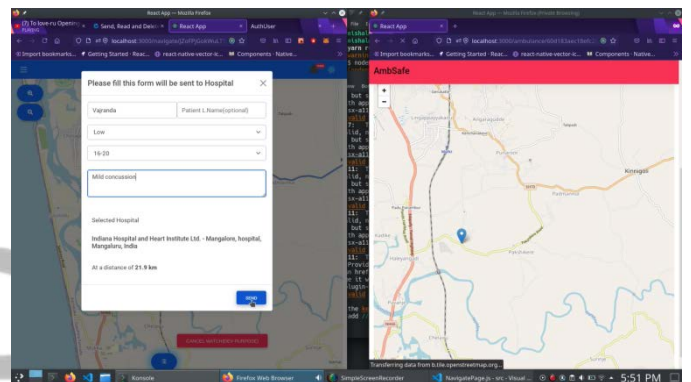

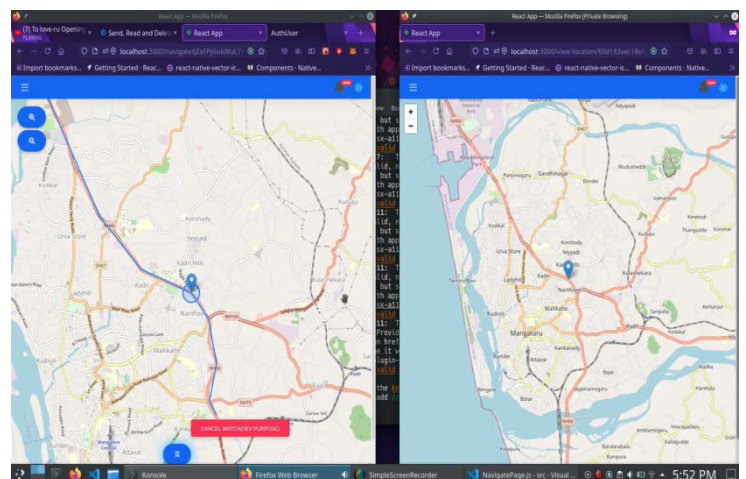Figure. 5 Software implementation

Figure. 6 Software implementation

Figure. 7 Software implementation

V. RESULT

The rate of loss of life due to accidents can be reduced. The hospital unit will get to know about the severity of the injuries of the patient in prior. The traffic unit will get to know about any medical emergency and can help in that process.

VI. CONCLUSION

The proposed system is used by the hospitals to track down their ambulances. The main aim of the project is to minimize the deaths of critical patients by making sure that they reach hospital in time for treatment. GPS technology is used so that the hospital can take immediate action which might reduce the severity. This system is accurate and the main advantage is that it saves a lot of time and also saves a large amount of man-hours caused by traffic problems and accident. Hospitals can use GSM technology to send the message to the ambulance regarding the location of the patient.

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