

Intelligent Traffic Signal Control System for Ambulance

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Abstract: Road traffic congestion becomes a major issue for highly crowded metropolitan cities. India is the second most populated country in the world and is a fast growing economy. It is facing terrible road congestion in the cities. According to Times of India about 30 percent of deaths are caused due to delayed ambulance to reach at hospital. In proposed system we are trying to reduce the delay for the ambulance. To smoothen the ambulance movement we come up with “Intelligent Traffic Signals Control System for Ambulance”. We are developing a website “HealthCard” for doing registration about medical history of all citizens, allow admin to add details of hospitals and doctors. Admin can also do the registration of citizens. This data will help to save the time in hospital to become ready for treatment. This data can be retrieved by using fingerprint authentication. This generated data will send to the particular hospital before the reaching of ambulance over there. In second phase, we are trying to provide the green signals for ambulance by switching the signals. We are going to use the technologies like Google Map API and RFID. Whenever signal detects the ambulance near to signal, then signal switches to green. As this system is automated, it recognizes the ambulance and controls traffic signals. This system controls traffic light and saves the time in emergency period. Thus it acts as a life saver project.

Keywords: Google Map API, RFID(Radio Frequency Identification), Healthcard, Traffic monitoring.

1. INTRODUCTION

Nowadays we all face the traffic problems as a major drawback of urban cities. It may lead to lose life of anybody in a critical situation. So we have to think to provide a solution to this problem to tackle the critical or emergency situations without the major traffic jams. In this project we are not only try to provide a way to ambulance but also tries to provide a ready situation in hospital to do the treatment of patient in time. For that purpose we come up with two solutions like storing the medical history of all citizens, suggesting the nearest hospitals and giving an optimal path to reach hospital in time. For storing a medical history of c we are going to provide an online portal as “HealthCard”. Citizens can register and store their information with authentication which provides security to them. This information helps to provide the medical data about the patient to hospital before the patient reaches the hospital. This leads to keep services ready for the treatment of the patient. Other service is to suggest the nearest hospital from current location of ambulance. And according to that suggest route, providing a free way to the ambulance. This is done by detecting the occurrence of ambulance and switching the signals to green. This will be done by using techniques like Google Map API and RFID. This project definitely acts as a “Life Saver” project.

2. LITERATURE SURVEY

Title 1:- GOLDEN AID - An Emergency Ambulance System

Authors: - Anita Acha George, Arun Krishna, Toney Dias and Asheena Sara Varghese and Divya R S

Year Of Publication:- 2017

In this paper they proposed, Golden aid is designed to control the traffic signals along the path of the ambulance, when an ambulance approaches an intersection the traffic light is switched to green and as soon as the ambulance passes the intersection the control is restored to the proper signal offset value again. Introducing an IoT based design for the system, it can be virtually be controlled from anywhere. Makes it universally controllable and increases the responsive effectiveness. It can be used in situations like traffic congestion, emergency management, VIP escort etc. Thus the system increases the possibility of saving a life.

Advantages:

- It makes life easier
- Real time monitoring of ambulance
- Unique identification of ambulance

Disadvantages:

- System fails when central server crash

Title 2:- An A Rescue System of an Advanced Ambulance Using Prioritized Traffic Switching**Authors:-** Tandrima Chowdhury ,Smriti Singh ,Dr.S.Maffin Shaby**Year Of Publication:-** 2016

In this paper they proposed,through GSM (Global System for Mobile Communications), it sends the location of the accident to the ambulance section. The buzzer produces sound when accident occurs. The central unit finds the ambulance, nearest to the accident spot and also the shortest path between the location of the accident, ambulance and the nearest hospital. Here, wireless technologies are used for information transferring. When the ambulance reaches the traffic junction, the encoder converts the serial data into parallel data when it passes from the transmitter to the receiver. If the signal is red, it comes to green automatically. The decoder in the receiver section converts the parallel data into serial data when it is sent back. This helps the ambulance to cross the traffic junction as soon as possible. The prioritized traffic switching is done priority wise, i.e. if two ambulances are coming at the same time, the ambulance which will arrive first at the traffic junction will be given the priority to cross the traffic junction before the next ambulance arrives.

Advantages:

- Simple to monitor the location of ambulance
- Track the real time coordinates of ambulance

Disadvantages:

- Internet connection must required

Title 3:- A Survey on IOT based Road Traffic Surveillance and Accident Detection System**Authors:-** Rickin Patel ,Vipul K. Dabhi ,Harshadkumar B. Prajapati**Year Of Publication:-** 2017

In this paper, the proposed system based on IOT is framed with the help of a processing board to process the data and a camera module to provide the live video as input. Raspberry pi board will be used as processing module and pi camera module will provide the input data in video raw format h.264 to the Raspberry pi. The system will detect the number of vehicle passing by, accident and predict the lane projectile of the vehicles on the road. The background subtraction using Gaussian mixture model and edge detection using canny edge is been executed on Raspberry pi.

Advantages:

- Able to detect the accident
- Vehicle detection and tracking

Disadvantages:

- Required more hardware
- Complexity to use video as input

Title 4:- Intelligent Traffic Signal Control System For Ambulance Using RFID And CLOUD**Authors:-** B.JananiSaradha, G.Vijayshri , T.Subha**Year Of Publication:-** 2017

Road traffic congestion becomes a major issues for highly crowded metropolitan cities like, Chennai .Ambulance service is one of the major services which gets affected by traffic jams. To smoothen the ambulance movement this paper have come up with the solution of Intelligent automatic traffic control for ambulance . The proposed system creates a android app that connects both the ambulance and the traffic signal station using cloud network. This system makes uses RFID (radio frequency identification) technology to implement the Intelligent traffic signal control. The basic idea behind the proposed system is, if the Ambulance halts on the way due to a traffic signal, RFID installed at the traffic signal tracks the RFID tagged ambulance and sends the data to the cloud. After the acknowledgment for the user through the mobile app, the particular signal is made Green for some time and after the ambulance passes by, it regains its original flow of sequence of signaling If, this scheme is fully automated, it finds the ambulance spot, controls the traffic lights. This system control the traffic lights and save the time in emergency periods. Thus it acts as a life saver project.

Advantages:

- Provide way to ambulance
- Provide alternative services Cloud and RFID

Disadvantages:

- Computation is complex due to cloud

Title 5:- Advanced Automation Control in an Ambulance under Emergency Condition**Authors:-** Lella Sai Krishna, Samineni Vijay Chowdary, M.Pushpavalli, P.Sivagam**Year Of Publication:-** 2017

In this paper, they proposed - India is facing huge traffic congestion and the traffic disturbance in many major cities around is very severe. Mainly in urban areas, most of the people are using cars as transport when they go out. Due to this traffic blockage, there is a rise in road accidents which direction to a ruin of individual human lives. To avoid this we have implemented a scheme which can control the traffic signals automatically in its path way and reduce the amount of traffic congestion at the signal. The ambulance is implemented with embedded system units, which finds the accident spot and delivers the spot to the close by ambulance through GPS .The ambulance guides the traffic lights in the roadway to the hospital and it also checks the next consecutive signal to shorten the time loss. The vehicle unit is equipped with vibration sensor to determine the vibration if it exceeds the level .The embedded unit sense the accident happens and its sends the neighborhood ambulance unit through wireless transmission. RFID reader is needed to extricate the ambulance from other vehicles.

Advantages:

- Detect the location of accident
- Ambulance detection and tracking

Disadvantages:

- Only detects the near by ambulance

3. PURPOSE AND MOTIVATION

Road traffic congestion becomes a major issue for highly crowded metropolitan cities. India is the second most populated country in the world and is a fast growing economy. It is facing a terrible road congestion in the cities. According to Times of India about 30 percent of deaths are caused due to delayed ambulance to reach at hospital. Human life is affected due to delay in the arrival of ambulance. The ambulance is not able to reach the hospital in the golden hour. It gets stuck in the traffic signals. It would be of great use to the patient if the traffic signals in the path of the ambulance are ON. In proposed system we are trying to reduce the delay for the ambulance. To smoothen the ambulance movement we come up with “Intelligent Traffic Signals Control System for Ambulance” . Here we are trying to save the time for treatment in two ways like storing medical information and providing a optimal route for the ambulance. Medical data get stored as the medical history of that patient and will use in a emergency conditions. This information will provide to the hospital before the patient get reach to hospital. This leads to save the valuable time of patient. Another module deals with the detection of Ambulance.The Ambulance get detected by the use of Google MAP API and RFID technology.These technologies helps to detect ambulance and switch the signal to green.This also helps to suggest the nearest hospital and the optimal route to reach hospital in time.

4. OBJECTIVES

- Monitoring and controlling traffic lights on specified path to hospital
- To identify possibility of ambulance on the road by using Google map API and RFID
- Suggest optimal route.
- Store the health data of user and use in emergency situation

5. EXISTING SYSTEM

GSM (Global System for Mobile Communications), it sends the location of the accident to the ambulance section. The buzzer produces sound when accident occurs. The central unit finds the ambulance, nearest to the accident spot and also the shortest path between the location of the accident, ambulance and the nearest hospital. Here, wireless technologies are used for information transferring. When the ambulance reaches the traffic junction, the encoder converts the serial data into parallel data when it passes from the transmitter to the receiver. If the signal is red, it comes to green automatically. The decoder in the receiver section converts the parallel data into serial data when it is sent back. This helps the ambulance to cross the traffic junction as soon as possible. The prioritized traffic switching is done priority wise, i.e. if two ambulances are coming at the same time, the ambulance which will arrive first at the traffic junction will be given the priority to cross the traffic junction before the next ambulance arrives.

6. PROPOSED SYSTEM

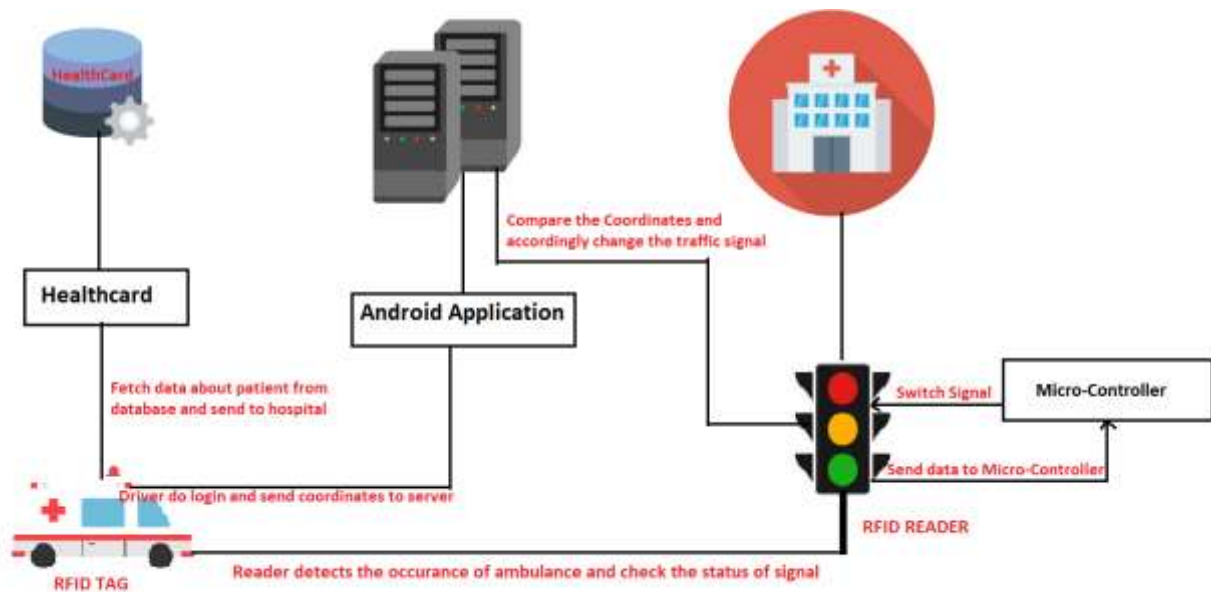


Fig: Architecture of System

Initially every citizen should register over a "HealthCard" system. HealthCard is use as a website to store the information of every citizen. Ambulance is track using Google Map API and RFID. When any patient is in ambulance, first task is to take the fingerprint of that patient and retrieve data from database. This retrieved file sends to the hospital before patient reach there. This will help to take prior actions required for the treatment of that patient. Google MAP API and RFID technology use to suggest the nearest hospital and provide the optimal route to reach hospital.

In case of using Google MAP API , android application is also used. When ambulance driver login to this android application, the current latitude and longitude coordinates are send to the server. Server has already stored latitude and longitude coordinates of traffic signal. When the coordinates from ambulance driver come to the server , server see whether the coordinates are within the specific range. If so, then server will take the action to change the signal to green. In case of RFID , ambulance gets detected by using RFID tag .RFID reader is able to detect the occurrence of ambulance. When ambulance with RFID tag passed through RFID reader, reader will send data to microcontroller. In this case microcontroller is Arduino. Arduino take data from RFID reader and check the status of signal. And according to the status of signal, it will take action to switch it to green.

7. METHODOLOGIES USED

- Google Map API
- RFID Technology

8. ADVANTAGES

- Provide free way to ambulance
- Tackle the emergency conditions
- Track real time location of ambulance
- Suggest the nearest hospital and route
- Storage of medical data of user

9. CONCLUSION

In this world of busy roads, traffic signal plays the vital factor in saving person's life. In this project we are not only tried to provide a way to ambulance but also tried to provide a ready situation in hospital to do the treatment of patient in time. We implemented two solutions like storing the medical history of all citizens, suggesting the nearest hospitals and giving an optimal path to reach hospital in time. Citizens can register and store their information with authentication which provides security to them. To suggest the nearest hospital and optimal path Google Map API and RFID technologies are used. This system detects the occurrence of ambulance and switch the signals to green. The entire system is automated, thus it require less human intervention. "Intelligent Traffic Signals Control System for Ambulance" increase the possibility of saving lives.

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