Ambulance Rescue system with Health Monitoring

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MCAE31 Mini Project

by

Nehal Jaiswal, 1MS21MC035
Shubham Shirod, 1MS21MC053

under the guidance of

ABHISHEK K L
Assistant Professor

Department of Master of Computer Applications

RAMAIAH INSTITUTE OF TECHNOLOGY
(Autonomous Institute, Affiliated to VTU)
Accredited by National Board of Accreditation & NAAC with 'A+' Grade,
MSR Nagar, MSRIT Post, Bangalore-560054
www.msrit.edu

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RAMAIAH
Institute of Technology

Department of Master of Computer Applications

CERTIFICATE

This is to certify that the project work entitled "Title" is carried out by

1MS21MC035, Nehal Jaiswal
1MS21MC053, Shubham Shirod

Student(s) of II semester, MCA, Ramaiah Institute of Technology, Bangalore in partial fulfilment for the, course MCAE31, Programming IoT, during the year 2022- 2023.

Faculty-In-Charge	HOD
Abhishek K L	Dr. S. Seema
Assistant Professor	Professor and Head

Name and Signature of the Examiners with Date

1)

2)

ABSTRACT

Road traffic congestion becomes a major issue for highly crowded metropolitan cities. Ambulance service is one of the major services which gets affected by traffic jams. To smoothen the ambulance movement this project has come up with the solution of “Smart ambulance rescue system with Traffic Control”.

The proposed system connects ambulance and the traffic signal station using cloud network. This system makes use of RFID (Radio Frequency identification) technology to implement the Intelligent traffic signal control by holding green signal for some time.

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INTRODUCTION

The main concept behind the project is to provide a smooth flow for the ambulance to reach the hospitals in time and thereby minimizing the delay caused by traffic congestion.

The project 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.

The Microcontroller based RFID system is used to alter the traffic lights upon its arrival at traffic light junction which would save lives at critical time.

Ambulance contains the information of patient and also emergency signal is send to the traffic control to control the traffic pattern according to the traffic density and based on ambulance driver requirement.

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 displays the data

PROBLEM DEFINITION

Traffic congestion is a condition on transport that is characterized by slower speeds, longer trip times, and increased vehicular queuing. India is one of the fastest growing economies in the world. The average income of Indians is growing and thereby the number of privately owned vehicles is rising.

Due to rapid urbanization, there is a need for implementing an effective traffic control system to avoid heavy congestion & also to make a better solution for Emergency Vehicle traffic clearance. There is a need for implementing an effective traffic control systems, to avoid heavy traffic congestion.

EXISTING SYSTEM

1. Depends on density, signal changes. Not specific with ambulance traffic control.
2. There is no update to hospital of patient current condition.
3. There is no existing system for effective traffic control so as ambulance can pass through.

OBJECTIVE

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 traffic the RFID tagged ambulance and sends the data to the cloud.

After the acknowledgement 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 controls the traffic lights and save the time in emergency periods. Thus it acts as a life saver project.

LITERATURE SURVEY

Title 1: - An Emergency Ambulance System

Authors: - Anita Acha George, Arun Krishna, Toney Dias and Asheena Sara Varghese and Divya R SYear 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.Maflin 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 is 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 vehicles 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 issue 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 signalling If, this scheme is fully automated, it finds the ambulance spot, controls the traffic lights. This system controls 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 neighbourhood 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 nearby ambulance

COMPONENTS REQUIRED

This device is consisting of the following components:

- Arduino Uno Microcontroller
- 16x2 LCD
- Jumper wires
- Led
- Breadboard
- RFID transmitter and receiver
- 12v Adapter
- Pulse Heart Rate Sensor
- Temperature Sensor
- L2C Display Adapter Module
- WSP82666 Wi-Fi Module

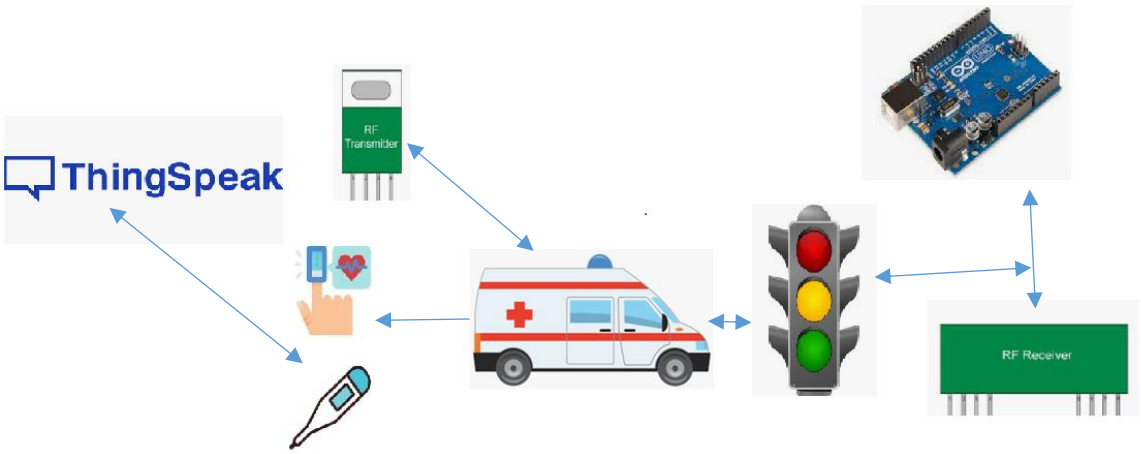
PROPOSED WORK

The main concept behind the project is to provide a smooth flow for the ambulance to reach the hospitals in time and thereby minimizing the delay caused by traffic congestion.

The Microcontroller based RFID system is used to alter the traffic lights upon its arrival at traffic light junction which would save lives at critical time.

Ambulance contains the information of patient and also emergency signal is send to the traffic control to control the traffic pattern according to the traffic density and based on ambulance driver requirement.

ARCHITECHTURE DIAGRAM



IMPLEMENTATION

1. Arduino: Arduino is an open-source platform used for building electronics projects. Arduino consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

2. RF Module: As the name suggests, RF module operates at Radio Frequency. This frequency range varies between 30 kHz & 300 GHz.

1) RF Receiver and Transmitter: This RF module is a combination of RF Transmitter and RF Receiver. The transmitter/receiver (Tx/Rx) pair operates at a frequency of 433 MHz. we use RF modules to transmitting and receiving the data because it has a high volume of applications than IR. RF transceiver module will always work in a pair that is it needs a Transmitter and Receiver to send and receive the data. A transmitter can only send information and a Receiver and can only receive it, so data can send from one end to another and not the other way around.

3. Pulse sensor: The Pulse Sensor is a plug-and-play heart-rate sensor for Arduino. It can be used by students, artists, athletes, makers, and game & mobile developers who want to easily incorporate live heart-rate data into their projects. The essence is an integrated optical amplifying circuit and noise eliminating circuit sensor. Clip the Pulse Sensor to your earlobe or fingertip. Then it into your Arduino, you are now ready to read heart rate.

4. Temperature Sensor: The temperature sensor in Arduino converts the surrounding temperature to voltage. It further converts the voltage to Celcius, Celcius to Fahrenheit, and prints the Fahrenheit temperature on the LCD screen. We will use a temperature sensor (TMP 36) of low voltage.

RESULTS DISCUSSION

- Patient Details are provided to hospital to take pre-preparations based on the severity of the patient.
- Patient’s health can be monitored in ambulance while going to hospital
- Hospitals can use this system for preparation before patient arrives.
- It provides with easy traffic management