

Automated Traffic Control Lights for Ambulance Detection Mechanism

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Abstract- Road traffic is main problem or issues for the cities such as Pune, Mumbai, etc. Ambulance service is which affected by the traffic. For this problem we are given a solution in our project. In proposed system we are using the techniques like Android mobile App, Ultrasonic sensor, RFID reader and RFID tag. Ultrasonic sensors are used to calculate the length of traffic and according to that calculations traffic of each lane will be managed. The RFID tag will be installed in ambulance and RFID reader will be placed at the surface of road. whenever the ambulance detected by the reader, data will be sent to the microcontroller. Android App is provided for some commands in case of RFID fails. This system controls the traffic light and save the time in emergency period

Keywords- RFID tags, RFID reader, Android App, Sensors.

I. INTRODUCTION

I.1 Problems on Hand

Traffic congestion is the major issue in many cities of India as well as in other countries. The traffic congestion occurs when the number of vehicles on the road exceeds the road capacity. This can also be termed as saturation. In a smooth flow of heavy traffic, incidents like accident or sudden braking of a car leads to traffic jams. While travelling on highways if sudden accident causes traffic jams and huge queues of vehicles has no option to escape from the jam but to wait for clearing of jam. The economic growth has an effect on the urban traffic. It also affects the emergency vehicles like ambulance. Due to the heavy traffic it takes more time to reach the hospital.

I.2 Basic Concept

The proposed system will examine the possibility of deploying an intelligent real-time traffic signal controller, which will receives information transmitted from sensors, and then utilizes this information to optimize the traffic signal scheduling at the inter-section. To monitor the density of the traffic, we will keep the ultrasonic sensors besides the road and depends upon the data from the sensors; the delay of the

traffic signals will be increase or decrease. RFID tag and RFID reader will be used to detect the emergency vehicles. For that, we have designed a framework for a dynamic and automatic traffic light control system and developed a simulation based model with codes in to help build the system. Generally, each traffic light on an intersection is assigned fixed signal time. It is possible to propose dynamic time-based coordination schemes where the green signal time of the traffic lights is assigned based on the present conditions of traffic. This System is used in heavy traffic roads and the junction which is based on the time as well as the density and the time delay will be controlled and density will control by program coded. If the traffic density is high on particular side more priority is given for that side. Main purpose of this system is to provide smooth flow for the emergency vehicles like ambulance. In this system we are providing a blue light or buzzer at traffic signal to inform that ambulance is coming from specific lane. With the help of RFID tags and readers ambulance will be detected and signal of that particular lane will be changed to the green from the red to provide the way to ambulance. System will also inform nearby hospitals about the emergency.

II. REQUIREMENTS

a. Software requirements:

- Arduino IDE.
- Embedded C programming language.
- JDK 1.8

b. Hardware requirements:

- Arduino Board.
- Ultrasonic Sensor / IR sensor
- RFID Tag and RFID Reader
- Bluetooth Module.

III. TECHNOLOGY USED

a) 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.

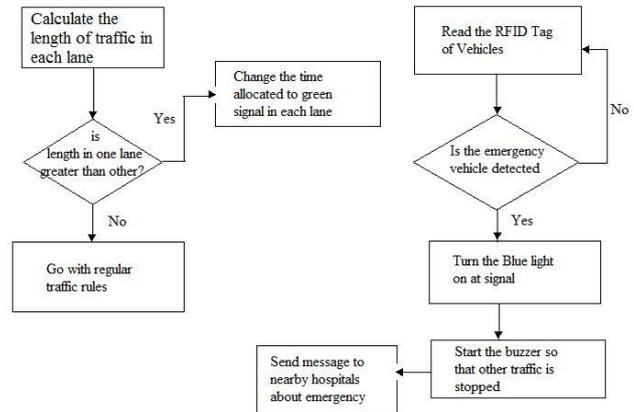
b) Traffic Length Identification using Ultrasonic Sensor

Ultrasonic sensors will be fitted at regular intervals on the road. The length of the traffic on each lane will be calculated using these ultrasonic sensors. The ultrasonic sensors detect whether the obstacle is present or not. So the sensor which returns no obstacle will be treated as end point of the traffic and density of traffic will be calculated.

c) RFID Tag Reader/Writer

The emergency vehicles will be provided the RFID tags and the RFID readers will be fitted under the road at some distance before the signal. Whenever the Reader will read any RFID tag of emergency vehicle it will do the intended action

V. PROPOSED ALGORITHM



VI. MODULES

Modules of this system are:

IV. METHODOLOGY USED FOR IMPLEMENTATION

a) Result and Analysis

1. Data flow from sensors to Arduino:

Data from the sensor nodes can be transmitted to the base station node through piece of coding. Through the initialization of the sensor component and using the statement data can be sent to the base station frequently. Since sensor nodes broadcast the data, we need to have certain validation to make sure that data received is from the right sensor node.

2. Communication for emergency vehicles:

The detection of emergency vehicles and the data will be send to the microcontroller. The RFID reader detects the data and passes it to the Arduino. The Arduino then handles the traffic signal.

➤ **Traffic Light Module:**

- Check the traffic on each lane at regular interval.
- Change signal from red to green for lane with more traffic.

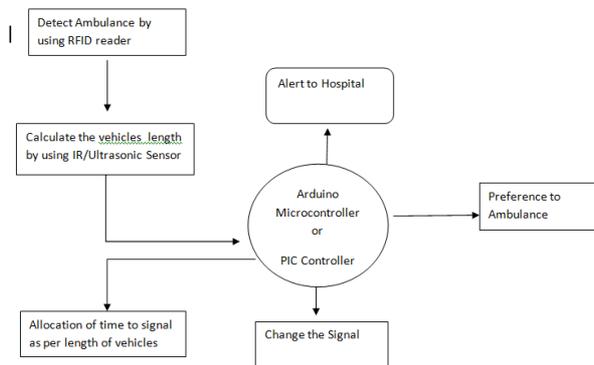
➤ **Emergency vehicle Module:**

- Detecting emergency vehicle on each lane.
- The emergency vehicles will be provided an RFID Tag. The RFID reader will be placed on the road surface. When any RFID tag will be detected by the reader, the emergency vehicle will be detected.
- Recognize the lane in which the emergency vehicle is coming and change the signal.
- If the signal of that lane is red then turn it to green to provide the way for the emergency vehicle.
- Switch on buzzer at the signal to inform the others about the ambulance.

➤ **Hospital Module:**

- When the ambulance is spotted at any signal the nearby hospital will be notified.
- Other vehicles will be notified about emergency vehicle with the help of buzzer.

VII. WORKING OF THE SYSTEM



VIII. CONCLUSION

This method will help reduce congestion on roads and by using this traffic control system for ambulance we can achieve the uninterrupted service of traffic control system by implementing the alternate methods for changing signals. This method will help to reduce congestion on roads and will help to reduce the time of ambulance to reach the hospital. The system can also save the life of any critical patient.

IX. FUTURE SCOPE

In future we can use various image processing algorithm to detect the length of traffic. Also the substitute for RFID tags can be used to detect the emergency vehicles more accurately. The data security mechanism can be embedded into the system to secure the data transmission against unwanted activities.

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