

INTELLIGENT TRAFFIC CONTROLLER FOR AMBULANCE USING RFID

Ms. Sandhya Onkar Ahire¹, Shrija Bhokare², Pooja Mate³, Prachi Sankpal⁴

Assistant Professor, Department of E&TC Engineering, AISSMS IOIT, PUNE¹

Student, Department of E&TC Engineering AISSMS IOIT, PUNE.^{2,3,4}

sandhya.ahire@aissmsioit.org, shrijabhokare1998@gmail.com, matepooja25@gmail.com, prachisankpal11@gmail.com

Abstract: This presents an intelligent traffic control system to pass emergency vehicles smoothly. An efficient vehicle tracking system is designed and implemented for tracking the movement of any equipped vehicle from any location at any time. The proposed system made good use of a popular technology that combines a Smartphone application with a microcontroller. Each individual vehicle is equipped with special RFID tag (placed at a strategic location), which makes it impossible to remove or destroy. We use RFID reader, system onchip to read the RFID tags attached to the vehicle. It counts number of vehicles that passes on a particular path during a specified duration. It also determines the network congestion, and hence the green light duration for that path. If the RFID-tag-read belongs to the ambulance, then a message is sent using IOT webpage to the hospital. Also, when an ambulance is approaching the junction, it will communicate to the traffic controller in the junction to turn on the green light. This Wi-Fi module uses ESP8266 modules for wireless communications between the ambulance and traffic controller. The prototype was tested under different combinations of inputs in our wireless communication laboratory and experimental results were found as expected.

Keywords: Microcontroller, RFID, IOT, WIFI module ESP8266

I INTRODUCTION

India is the second most populous country in the world and is a fast growing economy. It is seeing terrible road congestion problems in its cities. Infrastructure growth is slow as compared to the growth in number of vehicles, due to space and cost constraints. Also, Indian traffic is non-lane based and chaotic. It needs a traffic control solutions, which are different from the developed countries. Intelligent a management of traffic flow can reduce the negative impact of congestion. In recent years, wireless network are widely used in the road transport as they provide more cost effective options Technologies like Zig-Bee, RFID and GSM can be used in traffic control to provide cost effective solutions. RFID is wireless technology that uses radio frequency electromagnetic energy to carry information between the RFID tag and RFID reader. Some RFID systems will only work within the range inches or centimeters, while others may work for 100 meters (300 feet) or more. The main concept behind this 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. In future may get even

worse. In this cause Recovery action need to be taken immediately. So, for our over populated environment, there is a real need of this for the society to make easier day to day transportations. This will help to reduce blockage of emergency vehicles in traffic and helps to provide immediate recovery.

II LITERATURE SURVEY

From the literature survey it is observed that researchers have widely used of RFID and IOT module. Most of the research is about the plate recognition of ambulance. The Ambulance Reference Number matching was implemented on traffic signal obtained from RFID and an average accuracy of 90% was obtained.

Sensor based method were used by few researchers. When background is complex, it might contain more false license plate detection in Sensor based method. Sensor based method is used which requires much processing power and might result in slower processing time.

Proposed work aims at increasing time of processing on identification of the nearby hospital with all requirements

of patients. Topologies for various blocks have been finalized from the above literature.

Sr. No	Title	Author	Year of publication
1.	Golden AID-an emergency ambulance system	Arun Krishna, Toney Dies and Divya R.S	2017
2.	An rescue system of an advanced ambulance using prioritized traffic system	Smrti singh	2016
3.	A survey an IOT based road traffic surveillance and accident detection system	Vipul k Dhabhi	2017
4.	Intelligent traffic control signal system for ambulance using cloud and RFID	B.Janishrdha J vijayshri t.subha	2017
5.	Advance automation control an ambulance under emergency	Leela sai Krishna Chaudhary M.	2017

III. THE PROPOSED SYSTEM

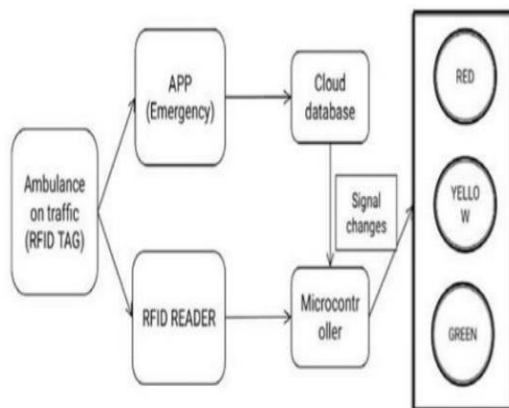


Fig.1.Block Diagram

Electronic Component:

- RFID reader
- Microcontroller

IV. METHODOLOGY

•ARDUINO UNO

The Arduino Uno is A microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog input, 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 a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USE -to-serial driver chip.

•ARDUINO MEGA 2560

The Arduino Mega is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog input, 4 UARTs (hardware serial ports), a 16 MHzcrystal oscillator, a USB connections, a power jack, an ICSP header, and a reset button.

In addition, there are two new pins placed near the RESET pin. One is the IOREF that allow the shields to adapt to the voltage provided from the board. The other is a not connected and is reserved for future purposes.

•5V DC SUPPLY

5V power supplies (or 5VDC power supplies) are one of the most common power supplies in use today.

Linear regulated 5VDC power supplies regulate the output using a dissipative regulating circuit. They are extremely stable, have very low ripple, and have no switching frequencies to produce EMI.

•LEDS

A light emitting diode (LED) is a semiconductor light source that emits lights when current flow through it

Electrons in the semiconductor recombine with electron holes releasing energy in the form of photons

The colour of light (corresponding to the energy of the photons) is determined by energy required for electrons to cross the band gap of semiconductor.

White light is obtained by

Using multiple semiconductors or a layer of light emitting phosphor on the semiconductor device.

•GPS

GPS Module have generally 4 pins Vcc, GND, Tx and Rx.

These modules usually communicate over simple serial connection like RS 232 that is the exact protocol which Arduino uses for serial communication, so we will simply use 'serial.begin()' to read the module data

•RFID - TRANSMITTER AND RECEIVER

This RF module comprises of RF Transmitter and RF Receiver. The Transmitter and Receiver (Tx and Rx) pairs operates at a frequency of 434 MHz.

An RF transmitter receives a serial data and transmits it wirelessly through RF through its antenna connected at a pin4. The transmission occurs at the rate of 1Kbps - 10 Kbps.

The transmitted data received by an RF Receiver operating at the same frequency as that of transmitter.

V. RESULT

The nearby hospital identified by the RFID by using ambulance reference code has to matching with RFID reference no which has been loaded by user.

The expected outcome of the project can be 90 %.

VI. CONCLUSION

With automatic traffic signal control based on the traffic density in the route the manual effort on the part of the traffic policeman is saved. As the entire system is automated, it requires very less human intervention. With stolen vehicle detection, the signal automatically turns to red, so that the police officer can take appropriate action, if he/she is present at the junction. Also SMS will be sent so that they can prepare to catch the stolen vehicle at the next possible junctions. Emergency vehicles like ambulance, fire trucks, need to reach their destinations at the earliest. If they spend a lot of time in traffic jams, precious lives of many people may be in danger. 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. Further enhancements can be done to the prototype by testing it with longer range RFID readers. Also GPS can be placed into the stolen vehicle detection module, so that the exact location of stolen vehicle is known. Currently, we have implemented system by

considering one road of the traffic junction. It can be improved by extending to all the roads in a multi-road junction.

VII.FUTURE SCOPE

- Extending the idea by implanting shortest location and way to hospital.
- Alerting the respective doctor in that hospital by providing initial medical details of patients.
- Facility to store details of several patients over long period of time.
- Ambulance and the web applications should be interfaced so that he need to give the input in order to start the ambulance.

ACKNOWLEDGEMENT

It is my great pleasure in expressing sincere and deep gratitude towards my guide Prof. S. O. Ahire, Assistant Professor Electronics and Telecommunication Engineering Department for his/her valuable guidance and constant support through this work and help to Intelligent Traffic Controller for Ambulance using RFID .

We take this opportunity to thank Head of the Department Dr. M. P. Sardey and all staff member of department of Electronics and Telecommunication Engineering AISSMS IOIT, Pune for cooperation provided by them in many ways. The motivation factor for this work was the inspiration given by our honorable principal Dr. P. B. Mane. Lastly I am thankful to those who have directly or indirectly supported for our work.

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