International Journal of Emerging Engineering Research and Technology
Volume 7, Issue 2, 2019, PP 45-48
ISSN 2349-4395 (Print) & ISSN 2349-4409 (Online)
DOI: https://doi.org/10.22259/2349-4395.0702006

Smart Travel Manage Scheme for Ambulance

Gogineni Charishma[1], Jasti Neeharika[1], Maddineni Parameswari[1], P. Bujji Babu[2]

[1]IV B.Tech, ECE Dept., Malineni Lakshmaiah Women's Engineering College Guntur, A.P
[2]Assistant Professor, Malineni Lakshmaiah Women's Engineering College, Guntur, A.P

ABSTRACT

Overpopulation is one of the world's most pressing issues today. In terms of facts, as the human population grows, so does the number of cars on the road. As a result, traffic management is a crucial issue in many major cities today. In many cities, traffic lights cause significant congestion, particularly for emergency vehicles. Because ambulances become delayed in traffic jams due to a lack of efficient traffic regulation, lives are lost. To solve this challenge, a smart traffic control system based on the integration of two separate systems is proposed in this work. The first system employs RFID and smart semaphores, whilst the second employs a stroboscopic effect in conjunction with a stroboscope. When these two technologies are combined, traffic can be easily controlled, and emergency vehicles can get to their destinations on time.

INTRODUCTION

With the growth in urbanization, industrialization and population, there has been a tremendous growth in the car traffic. With growth in it, there are occurrences of bundle of problems too, which include traffic jams, accidents etc. [1]. One of the adverse effects of traffic jams are faced by the emergency vehicles like ambulance, fire brigades etc. This problem of ambulance when getting stuck in a traffic jam can be addressed by ensuring that the lane in which the ambulance is travelling is cleared. This can be done by signalling the nearest traffic light whenever there is an ambulance approaching.

However, all the ambulances will not be carrying emergency cases thus the use of RFID (radio-frequency identification) tag will distinguish the emergency and non-emergency cases [2], hence preventing unnecessary traffic congestion. Further, RFID tag will only act as a sensor in the emergency situations and will pass on the signals to the traffic lights.

Another method proposed for signalling the traffic light is by application of strobe lights as an indicator. In this technique, flashing strobe lights of emergency vehicles will be sensed by cameras and strobe sensors which are directly connected to the traffic light controller, hence signalling the presence of emergency vehicles.

The signals received from either RFID reader or light sensors are then collected by Semaphores present at every roads of the junction. The sequence of these semaphores will be controlled by the Programmable Integrated Circuit (PIC) microcontroller [3]. The intended system is to change the sequence back to the normal sequence after triggering for the emergency modes by using the controller.

BACKGROUND

Radio frequency identification or so called RFID is a technology used for automatically identifying a person, a package or an item using radio signals. To do this, it relies on RFID tags. These are small transponders which transmit identity information over a short distance, when asked. Most RFID tags contain at least two parts. One is an integrated circuit which stores some information, modulating and demodulating a radio frequency (RF) signal, and other special functions. The second is an antenna for receiving and transmitting the signal. There are mainly two types of RFID tags: active RFID tags, which contain a battery, and passive RFID tags, which have no battery. The life of passive tags is much longer as compared.

In the real life a semaphore (traffic light) is a system of signals used to communicate visually, usually with lights. In software, the semaphore is a data structure which is useful for solving a variety of synchronization problems. Implementation of semaphores is available as part of the programming language or the operating system, therefore it can be

easily modified as per ones requirements. In other words, semaphores could be used as a better option instead of traffic signals.

The strobe light or stroboscopic lamp, is a device used to produce regular flashes of light which can be in different colours.

Further, a stroboscope is an instrument used to make a cyclically moving object appear to be slow-moving, or stationary. It consists of a rotating disk with slots or holes or a lamp such as a flashtube which produces brief done again flashes of light. The rate of the stroboscope is adjustable to some different frequencies.

New Proach for an Intelligent Urbm Traffic Light System

The proposed system contains 3 different units which are interconnected with each other, namely: Ambulance unit- detection of emergency vehicles; Junction unit- control the junction semaphores; Flow control unit- manage the direction of ambulance.

Ambulance Unit

This unit is further divided into 2 systems- RFID system and Strobe detection system. These systems can work both separately as well as in combination. If used separately the combination of these systems will not only be more efficient but will be more secure as it will be very difficult to hack or violate the conditions.

RFID System

This system consists of a RFID tag installed in the ambulance. It will be used as a sensor in a case of emergency. This means that whenever there will be an emergency, driver of the ambulance will activate the RFID tag which will be then detected by the RFID readers present few meters before or on the junction semaphores. These readers will then continuously pass on the signals to the junction unit where the controlling of semaphores will take place. As soon the ambulance having the active tag cross the junction, the reader will stop sending the signals and conditions will turn back to normal. Also since every road will have a separate semaphore, therefore number of RFID readers present will be same as that of semaphores. For example, at a junction of 4 roads, there will be 8 semaphores; hence there will be 4 RFID readers as shows Fig. 1 [4].

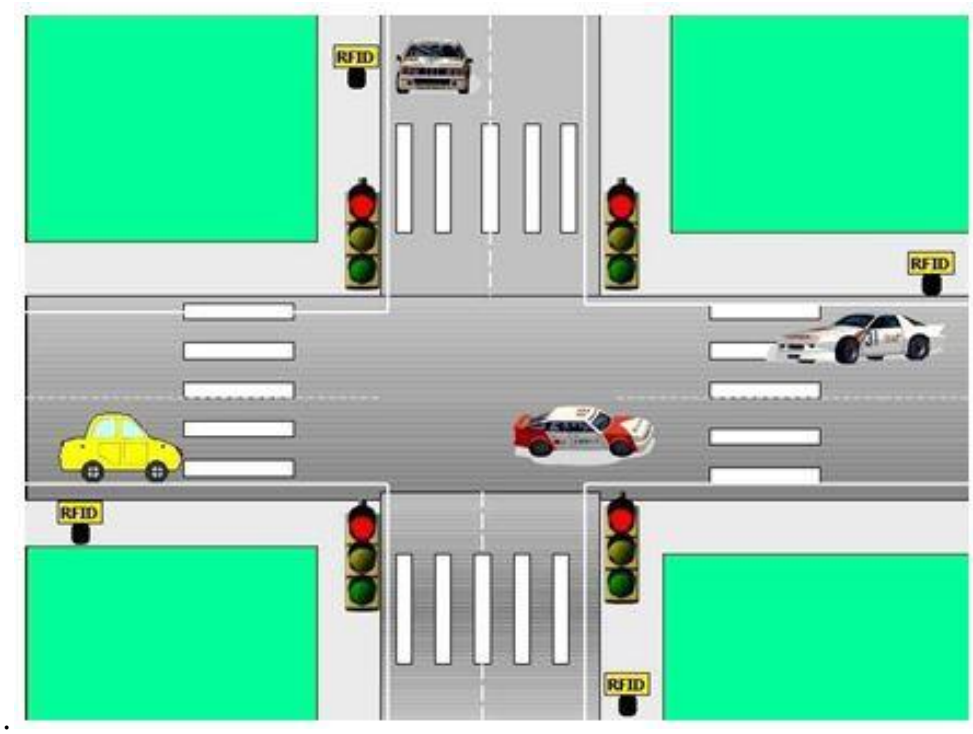

Fig1. *RFID reader positioning on the road schema*

The access control is detection of IDs entry to or exit from the range area of the RFID reader. After the detection via RFID, the signals are then transferred to the junction unit. A simplified flowchart of entire ambulance unit is shown on fig. 2.

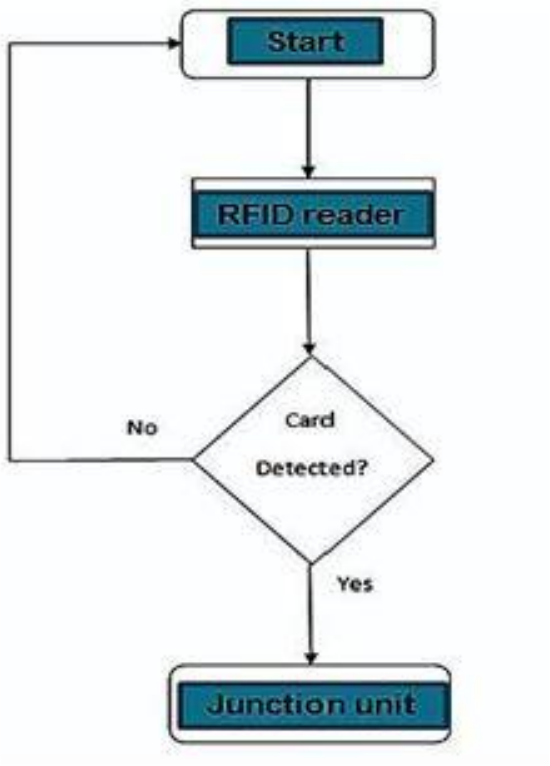

Fig2. *A simplified flowchart of entire ambulance unit*

Strobe Detection System

It is estimated that more than 90% of the sensory input to a motor vehicle driver is obtained visually. Thus, visual warning systems are likely to be crucial in alerting drivers to the approaching ambulance. When an emergency vehicle approaches a junction, it needs the light to be green. Each emergency vehicle has a special strobe light that triggers the traffic light which will behave as the indicator light for the traffic signal. When the sensor is triggered, the traffic light shows green for the approaching emergency vehicle. Thus sensors will be directly connected to the microcontroller present in the junction unit. As soon the emergency vehicle passes the junction, the sensors will be turned off and the traffic sequence will get back to normal.

Junction Unit

Junction unit must be installed at the crossroads and consist of semaphores or traffic signals present on every side of the road. The sequence of these signals will be controlled by the Programmable Integrated Circuit (PIC) microcontroller interfaced with a transceiver.

Working of junction unit is processed in steps. Initially the signals sent by the RFID reader or sensors are collected by the transceiver interfaced with the microcontroller. After recognising the received signals, the microcontroller activates the emergency mode and the sequence of the semaphores present at the junction must change. The sequence is getting back to the normal mode only when the transceiver stops receiving the signal from the RFID reader or the light sensors.

The sequence of traffic signals is working differently in the two modes.

Conclusions

The proposed smart traffic control system for ambulance is based on radio frequency identification and stroboscopic identification of an ambulance in emergency case. The use of the both systems in same time for identification stands on the identification of a real case of emergency and as a prove for such car regime. In other systems which use only stroboscopic effect of the ambulance vehicle it is possible to overcome their defence and to be hacked by a random driver using the same light signals in front of the urban traffic light. Only if the both systems are activated simultaneously this will change the traffic light on green for the path way of the ambulance. The suggested system is going to be implemented in future for further experimentations and demonstrations.

REFERENCES

[1] N. M. Z. Hashim, A. S. Jaafar, Traffic Light Control System for Emergency Vehicles Using Radio Frequency", IOSR Journal of Engineering, Vol. 3, Issue 7, 2013, PP 43-52.

[2] The European Commission, Intelligent Transport Systems (ITS), http://ec.europa.eu/ transport/themes/ its/index en.htm, 2015

[3] Oshevire Patrick, Design and Implementation of a Four ways or Junction prototype crossroad traffic light control system. J. of Advancement in Eng. and Tech., 2014.

[4] http://image.slidesharecdn.com

Citation: *Gogineni Charishma et al, "Smart Travel Manage Scheme for Ambulance", International Journal of Emerging Engineering Research and Technology. 2019; 7(2): 45-48. DOI: https://doi.org/ 10.22259/2349-4395.0702006*