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Traffic Light Priority Control For Emergency Vehicle

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Abstract: *Vehicular traffic is endlessly increasing everywhere in the world and cause terrible traffic congestion at intersection Most of the traffic lights feature a fixed green light sequence is determined without taking the presence of the emergency vehicles into account. Therefore, emergency vehicles such as ambulances, police cars, fire engines, etc. stuck in a traffic jam delayed in reaching their destination can lead to loss of property and valuable lives. In this proposed project we define how traffic signal lights detect emergency vehicles, how to manipulate the traffic light and how to provide free way to emergency vehicles*

Keywords *- **Emergency vehicles, Traffic congestion, RFID, LED LIGHT***

I. INTRODUCTION

1.1 Problem statement

The rapid growth in the vehicle ownership is one of the measures for economic growth of country. However indirect effect of vehicle ownership is acute traffic congestion. The exploitation of new trends and technologies requires fast transportation of goods, machinery and manpower for various reasons.

1.2 Overview

Each person's purpose is to arrive at their destination without wasting time or money. However, current infrastructures have a finite number of resources. As a result, road traffic management is critical for reducing wait times and travel times, as well as saving fuel and money. Despite the fact that the current traffic signal management system manages traffic at junctions, it frequently causes congestion due to its poor performance. An emergency vehicle travels miles through a metropolis to reach its destination, passing through multiple city intersections along the route. The emergency vehicle will spend valuable time at most junctions if the traffic system at those intersections is governed by preset timers.

Expansion of road infrastructure isn't the only way to alleviate traffic congestion. It will necessitate some intelligent technique to address the issues with the current traffic control system. The suggested system in the paper additionally includes a map function that displays the current traffic status at the desired traffic signal. This system will provide traffic information and available faster route.

1.3 Literature Survey

Based on expert system Findler and Stapp explain the Traffic light Controller (1992).An expert system makes decisions based on a set of rules. In traffic light control, such an action can alter some of the control parameters, necessitating the design of completely new system.

Tan`s description of the Fuzzy Logic Traffic Light Controller (1995).Fuzzy logic controller by tan determine time delay by various traffic congestion solving methods this system depends on preset values of fuzzy variables.

Thorpe(1997) describe neural network for traffic light controller.In this system use a neural network to forecast the

waiting time for all cars at the intersection .This means the traffic light controller deal with huge number of states, with significant learning time and volatility.This system takes large time and varint.
The purposed system overcomes time postpone visitors signal controlle and one of kind conditored condition for emergency vehical with the aid of using providering accurate and fastest route.

II. TRAFFIC LIGHT PRIORITY CONTROL FOR EMERGENCY VEHICLE

2.1 Research Method

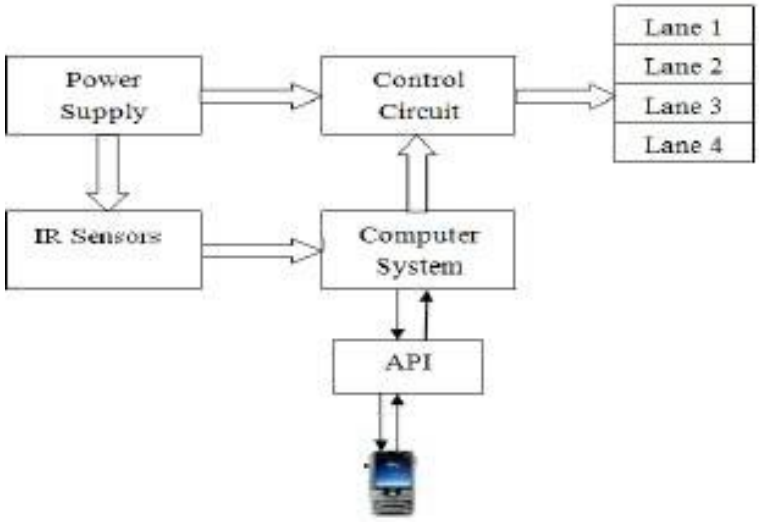

Fig.1 Block Diagram of a Smart Traffic Light Controller

Figure 1 depicts the block diagram of a Smart Traffic Light Controller, which includes API, STC circuit, computer system, and IR Sensors. The sensors monitor traffic at the signal and offer it as an input to the computer system, which then determines the time period through programming, which is subsequently sent to the signal via the control circuit. Finally, a time period is assigned to the signal based on the current traffic, and the red, green, and orange light signals illuminate accordingly**.**

Infrared sensors are installed on the road to detect vehicles. A sensor assembly positioned on each route detects the presence or absence of a vehicle. The STC unit receives this as an input. The STC unit creates Red, Green and Yellow Signal output signals and monitors their timings while taking into account the amount of cars on each road. The same information is sent to the mobile user, who will inquire about the traffic situation. If a vehicle driver at a crossroads sends an SMS to the STC unit on a GSM phone, the driver will receive a message showing the road's congestion state. If the current traffic is heavy, the STC system will also provide information on an alternate route to the user.
When a vehicle, such as an ambulance, fire truck, or police car, is in emergency mode, the signals are changed to allow these vehicles to drive quickly and easily. If an emergency vehicle passes by the route, the traffic signals on the roads that cross it will turn red, causing all vehicles on these roads to come to a halt. This is a crucial feature that will come in handy in an emergency.

2.2 HARDWARE ARCHITECTURE

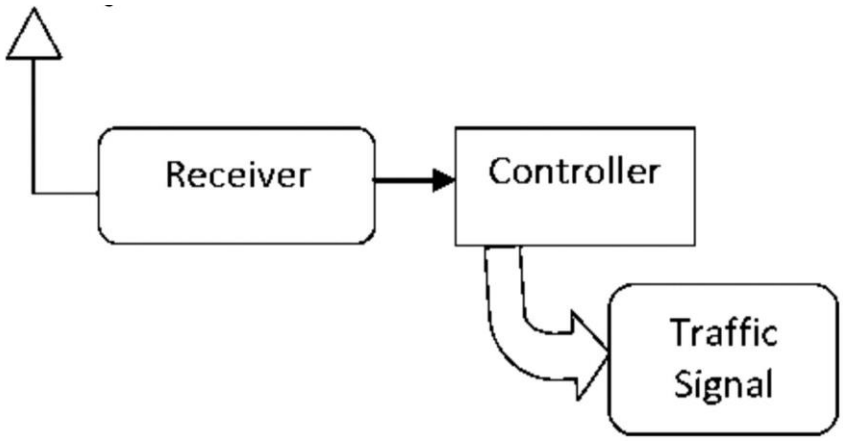

Fig.2.Traffic Junction Unit

Traffic Junction Unit: The stepwise flow of an traffic junction unit is as shown in below figure no 2 Here the receiver will receive the transmitted data and send it to the controller. Controller is controlling all other components. And according to received data give the instruction that the lane on which ambulance is coming, turn the green signal on in that lane. So by this way the first priority is given to the EMERGENCY Vehicles.

2.3 RESULT

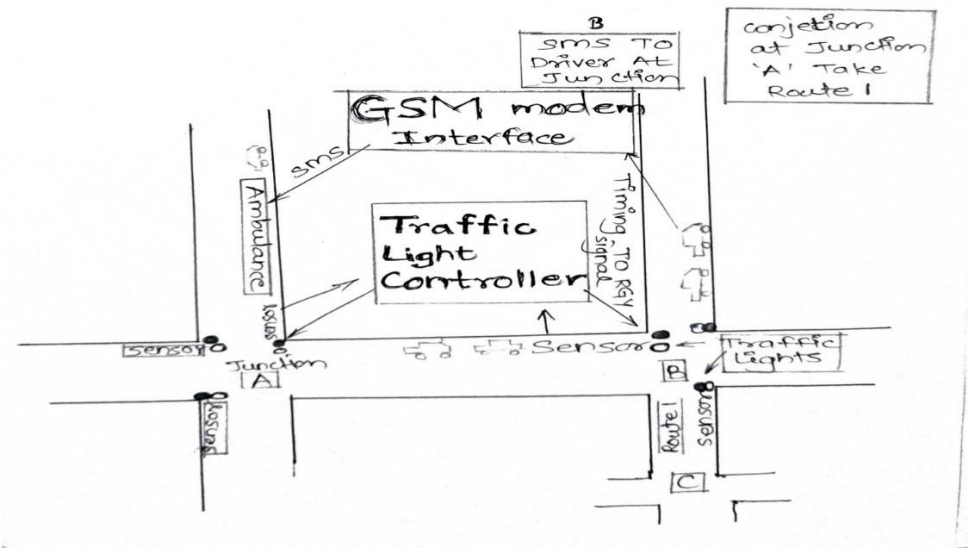

FIG.3.Basic concept of smart traffic light controller

Figure 3 depicts the basic model of a smart traffic light controller system. The proposed model depicts the junctions as letters A, B, and C. At each intersection, infrared sensors are put on the roadside to measure traffic length. Sensors detect traffic levels and feed this information to a computer system, which determines how long each red, green, and orange light should be lit. As illustrated in the diagram, if there is high traffic congestion at junction A, automobile drivers will be notified through SMS of the congestion so that they can choose to take a different route, such as route 1 passing through C. If an emergency vehicle passes through route A-B, the signals on the roads that cross this route will turn red, causing all vehicles on these roads to come to a halt. This is a crucial feature that will come in handy in an emergency.

II. CONCLUSION

This research introduces the smartness of traffic signal controllers through specialised actions and hardware interfaces. The software API gives the administrator a simple interface. In terms of shorter waiting time, efficient operation during emergency mode, and providing alternate routes to emergency vehicles, the proposed system outperforms the current traffic control system.

REFERENCES

[1] Shilpa S. Chavan(Walke), Dr. R. S. Deshpande, J. G. Rana (2009) "Design of Intelligent Traffic Light Controller using Embedded System", Second International Conference on emerging trends in Engineering and Technology.

[2] Tavladakis and Voulgaris (1999) "Development of an autonomous adaptive traffic control system", In ESIT '99 - The European Symposium on Intelligent Techniques.

[3] Thorpe (1997) "Vehicle traffic light control using sarsa", Master's thesis, Department of Computer Science, Colorado State University.

[4] Findler and Stapp (1992) "A distributed approach to optimized control of street traffic signals", Journal of Transportation Engineering.

[5]B. Janani Saradha, G. Vijayshri, and T. Subha, "Intelligent Traffic Signal Control System for Ambulance using RFID and Cloud," IEEE Proceedings on Computing and Communications Technologies (ICCCT), pp. 90-96, 11 Jul 2017.

[6]S. N. Sivaraj, K. Vigneshwaran, S. Vigneshwaran, and M. Vishnu Priyan, "IoT Ambulance with Automatic Traffic Light Control," SSRG International Journal of Industrial Engineering (ICRTECITA), pp. 12-18, Mar 2017.

[7]K. Sangeetha, P. Archana, M. Ramya, and P. Ramya, "Automatic Ambulance Rescue with Intelligent Traffic Light System," IOSR Journal of Engineering (IOSRJEN), vol. 4, pp. 53-57, Feb 2014.

[8]N. Hashim, N. F. A. M. Azmi, F. Idris and N. Rahim, "Smartphone Activated Door Lock using WiFi," ARPN Journal of Engineering and Applied Sciences, vol. 11(5), pp. 3309-3312, Mar 2016.

[9]S. Kapoor, P. Gupta, P. Sharma, and P. N. Singh, "Intelligent Ambulance with Automatic Traffic Control, [10]International Research Journal of Engineering and Technology (IRJET), vol. 4, pp. 1264-1266, Apr 2017.

[10] ALLSOP R.E.: 'SIGSET: a computer program for calculating traffic capacity of signal-controlled road junctions', Traffic Eng. Control, 1971, 12, pp. 58–60 & LITTLE J.D.C.: 'The synchronization of traffic signals by mixed integer-linear-programming', Oper. Res., 1966, 14, pp. 568–594

[11] PAPAGEORGIOU M., DIAKAKI C., DINOPOULOU V., KOTSIALOS A., WANG Y.: 'Review of road traffic control strategies', Proc. IEEE, 2003, pp. 2043–2067

[12]B. Janani Saradha, G. Vijayshri, and T. Subha, "Intelligent Traffic Signal Control System for Ambulance using RFID and Cloud," IEEE Proceedings on Computing and Communications Technologies (ICCCT), pp. 90-96, 11 Jul 2017.