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INGINIOUS TRAFALGAR CONTRIVITION SYSTEM

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ABSTRACT:
In recent years, because of quick urbanization there is a requirement for executing a powerful traffic signal framework to stay away from substantial blockage. And furthermore, to improve an answer for emergency vehicle freedom assists with ensuring human life. The thought behind our task is to give powerful traffic signal frameworks by the utilization of embedded innovations. This paper focuses on emergency vehicle freedom and the attempt at manslaughter vehicles will be identified. This utilizes RF beneficiary and transmitter and transfers alongside Embedded innovation. On the off chance that a crisis vehicle is identified out and about, the path where this vehicle is distinguished. Along with that hit-and-run vehicles will be found by utilizing a product application with a brief timeframe In order to reduce the avoid traffic congestion effectively we are putting forth a new methodology called INGINIOUS TRAFALGAR CONTRIVITION SYSTEM

KEY WORD: Embedded Technologies, RaspberryPi ,Road Safety Android App

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I.INTRODUCTION

Every year, many people die, lose their homes, and are exposed to permanent injuries or physical disabilities due to road accidents, fires, earthquakes, floods and other disasters. This becomes worse in case of delay in the required assistance from emergency response vehicles such as ambulances or fire-trucks etc.

As seen in the Fig.1.When an emergency response vehicle is delayed by a few minutes, it makes a big difference in saving the lives of people in emergency. Studies by Saudi Red Crescent Authority [1] revealed that "70% of the deaths could have been saved, if the emergency teams intervened faster".

We have developed a system for emergency response vehicles. The main idea is that when an emergency response vehicle will arrive at traffic lights, it will find them opened without any conflict with other signals. The system works almost seamlessly, i.e., without any notice by others.

The paper involved the design of automatic traffic controller for emergency vehicle and software is designed for the hit and run vehicles and other traffic violation process which happens in the roadways and this paper works on both hardware and software application. And Traffic load is highly dependent on parameters such as time, delay, season, weather and unpredictable situations such as accidents,specialevents,or constructional activities.

II.PROBLEM STATEMENT

Traffic congestion is a main problem in many cities .In India the traffic lights are discovered on timing system i.e, whether the vehicles are there or not the timing system will remain same which makes people to wait unwantedly for more time. The key characteristics of the light in cities particularly for growing the geographies is that even if the geographies are mentioned on the roads it does not move through the lanes. In Emergency cases the signals are precise manually, which is a hard-hitting task and cannot be executed successfully.

(a) (b)

Fig.1. Traffic problem

III.SURVEY

The most recent systems use IR technology, visual sensing, RFIDs or radar system, which can open a signalwhen the vehicle comes nearer to the signal on an intersection. Other systems use present location of the vehicle and send a request to central traffic controller to manage traffic lights in order to minimize the wait time for emergency response vehicles. However, our proposed system uses many techniques in order to completely eliminate the wait time for emergency response vehicles on traffic lights. It uses Android app, MQTT protocol and Google maps for all traffic lights on the path.

Singh et al. [3] propose intelligent traffic lights based on RFID. Aaron et al. [4] propose a system for overriding of traffic control, e.g. by signal transmitted by an emergency vehicle to open a traffic light for an moving vehicle. Djahel et al. [5] propose a method for

decreasing emergency services response time in smart cities using acquire and fuzzy-logic based approach. Mirchandani et al. [6] propose a method where the signals are set based on real-time optimization of the phasing that considers all the vehicles on the network, the passenger counts in the buses, and the schedule status of the buses. Soufriere et al. [7] propose a framework in which the Traffic Management System (TMS) may adapt by dynamically adjusting traffic lights, changing related driving policies, recommending behaviour change to drivers, and applying essential security controls. Nellore et al. [8] propose traffic management for emergency vehicle priority based on visual sensing. This approach combines the measurement of the distance between the emergency vehicle and an intersection using visual sensing methods, vehicle counting and time sensitive alert transmission within the sensor network. Krishna et al. [9] propose an intelligent network of smart traffic lights which all turn green in anticipation of an approaching emergency vehicle. Aníbal et al [10] propose to manage the traffic lights from inside of the emergency vehicles, i.e., to provide the control to drivers over the traffic lights to minimize the wait time.

[11] provides a detailed survey of optimal path planning and traffic signal control systems for emergency vehicles.

Our proposed system uses a combination of technologies that differs from the existing techniques. It uses an RF transmitter and receiver ,RASPBERRY PI, androidapp and the Internet for connecting them together. RF Transmitter and receiver, transmit and receives the signal when the emergency vehicle will arrive at the traffic lights, it will find them opened without any conflict with the other signals. The android app will be used to file the cases when the vehicle will be hit-and-run .

IV.HARDWARE COMPONENTS

In smart traffic control system, we have developed a mechanical setup for the process. The following are the hardware components used,

1. Raspberry Pi
2. RF MODULE
3. LED
4. Battery

1) RASPBERRY PIE

Raspberry pie is the name of a series of single-board computers.It is very cheap computer that runs Linux,but it also available to set a GPIO(general purpose input/output)pins that allow to control electronic device for physical computing and analyse the Internet of things(IOT)

Fig.2.Model of Raspberry Pi B+

1. Hardware of raspberry pie:

The Raspberry Pi hardware has progress through several versions that feature variations in memory capacity and peripheral-device support.

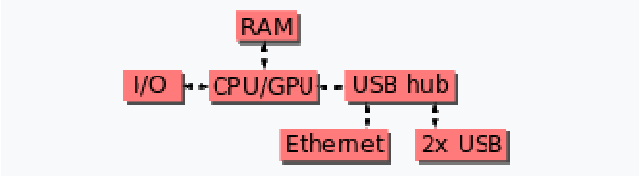

Fig.2.block diagram of Raspberry pie

Fig.2.block diagram tells about Model B and B+; Model A, A+, and the Pi Zero are same, but lack the Ethernet and USB hub components. The Ethernet adapter is internally connected to an extra port of USB. In Model A, A+, and the Pi Zero, the USB port is connected to the system on a chip . On the Pi 1 Model B+ and later models the USB/Ethernet chip consists of five-port USB hub, of which four ports are available, while the Pi 1 Model B only produces two. On the Pi Zero, the USB port is also connected mainly to the SoC, but it uses a micro USB (OTG) port. Unlike all other Pi models, the 40 pin GPIO connector is omitted on the Pi Zero with solder able through holes only in the pin locations. The Pi Zero WH remedies this.

a) General purpose input-output (GPIO) connector

Raspberry Pi 1 Models of A+ and B+, Pi 2 Model of B, Pi 3 Models A+, B and B+, Pi 4, and Pi Zero, Zero W, and Zero WH GPIO J8 consists of 40-pin pinout Raspberry Pi 1 Models A and B have only the first 26 pins.

2. RF MODULE

An RF Module (short for radio-frequency module) is a (usually) small electronic component used to transmit and/or receive radio waves between two devices. In an embedded system it is sensible to communicate with another device wirelessly. This wireless communication may be skillful through opticalcommunication orthrough radio-frequency (RF) communication. For many uses, the medium of choice is RF since it does not require line of sight. RF communications incorporate a transmitter and a receiver. They are of various types and ranges. Some can transmit up to 500 feet. RF modules are sometimes fabricated using RF CMOS technology.

TYPES OF RF MODULE

The term RF section can be applied to many different types, shapes and sizes of small electronic sub assembly circuit board. It can also be applied to modules across a huge variation of performance and capability. RF modules typically assimilate a printed circuit board, transmit or receive circuit, antenna, and serial interface for communication to the host processor.

Most standard, well known types are covered here

- transmitter module
- receiver module

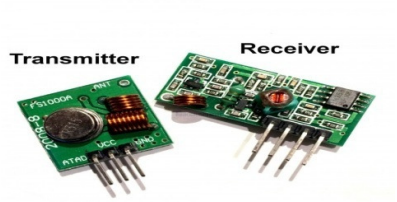

Fig.3Model of RFID transmitter and receiver

a) Tranmitter Module

The transmitter module consists of a RF transmitter for transmitting the signal through antenna. The input of RF transmitter is through power supply. The transmitter module will be fixed in the emergency vehicle.In case of any emergency ,the relay should be ON, the input will be given to the transmitter. The figure 5 shows the isolated Transmitter module.

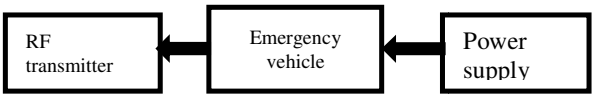

Fig.4.Block diagram of transmitter module

RF transmitter is enabled if the signal from the ambulance unit is received in the raspberry pin. Then the signal from transmitter module is transferred to receiver module.

b) RECEIVER MODULE

In receiver module, RF receiver receives the signal from transmitter antenna and provides the signal to controller module. The receiver module which is present in the traffic signal which gets signals from the transmitter an it gets opened.

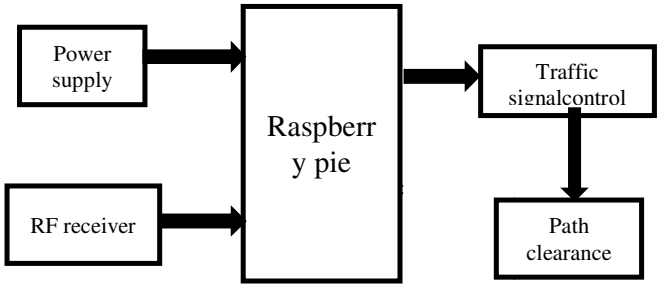

Fig.5.Block diagram of receiver section

3. LED

Fig.6.Model of LED

In the receiver end if the receiver gets signal.the red LED get changes automatiocally to green LED because of the signal passing through antenna where the emergency vehicle comes before 100m from the traffic cjunction.

4.***Battery***

The **9-volt battery**, is a common size of battery that was introduced for the early transistor radios. It has a rectangular prism shape with rounded edges and a polarized snap connector at the top

Here we use a 9v battery as a input supply for the RF transmitter which we used in our mechanical setup,

Fig.7. Battery

V.SOFTWARE USEAGE

The embedded programming is being dumped in the raspberrypie, could be used to transmit and receive the signals when the emergency vehicle is passed the traffic signals.

Our software app **Road Safety Android** is created by using the C language to find the hit-and-run vehicle. When one vehicle is clashed the another vehicle .the clashed vehicle which could not stop in the accident spot and moves on. Those vehicle number and colour and type of an vehicle along with the location could be registered as a complaint through this app.Thus complaint will send as e-mail to the control room. Thepolice were easily caught the acquits within a period of time.

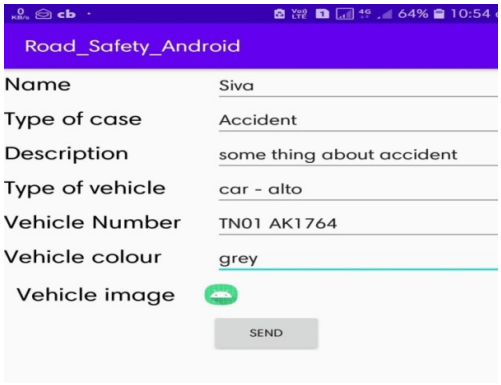

Fig.8. image of complaint register through app

Fig.9. image of complaint received as mail

VI.Hardware setup

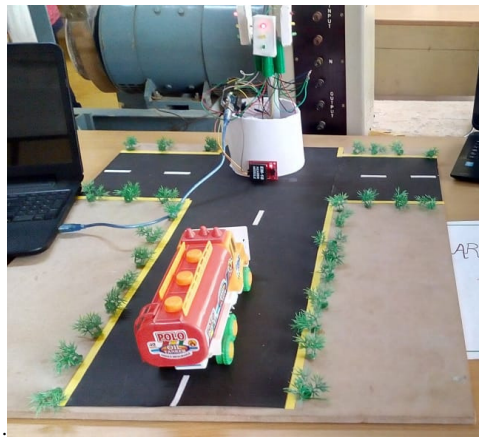

Fig.10.Hardware Setup

From this setup,we come to know that when there is any emergency cases ,in the starting pointing itself the drivers of the emergency vehicle should ON the relay switch during that time, when the vehicle reaches before 100m from the signal the RFID transmitter starts transmitting the signal to the junction at that time when the red light is blinking in the ambulance path and in the other side green light is blinking and RFID receiver receives the signal which is fixed in the traffic gets open which means ambulance path turns into green and others side become red signal , when vehicle reaches the signal junction before the 100m.So the emergency vehicle could notwait in the traffic jams,it could reach the destination in a earlier time and it could saves many human life.

VII.PIN DIAGRAM OF TRAFFIC LIGHT

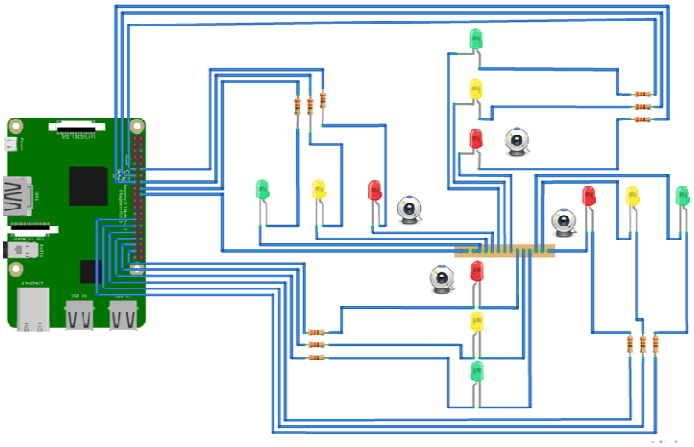

Fig.11.PIN diagram

Here Fig.11. represents the pin diagram of traffic light which we arranged in our setup.

VIII. RESULT

Thus we obtained the expected result that when the transmitter transmits the signal and receiver hand received that and the red light which is blink in the traffic junction which is automatically changes to green during the emergency.

And also we get a mail when the complaint is registered in the road safety android app during the hit and run vehicle.

IX.CONCLUSION& FUTURE SCOPE

Several deaths could have been avoided if the emergency teams intervened faster. Emergency related vehicles should not waste time while waiting on traffic lights. We have proposed a smart traffic lights system (STLS) that uses an Android app, RF transmitter and receiver and the Internet for connecting them together which can allow emergency related vehicles to safely cross the traffic lights without any delay. The proposed system is much better than other systems available in this category as it uses map technique. The proposed system can provide shortest/fastest path to the destination with all traffic lights opened so that emergency related vehicles don't need to wait on traffic lights which would save many lives in danger. The appraisement of the fully-functional prototype shows that he proposed system has very high performance and is 100% reliable.

In future the steer sensor can also be fitted with the existing system, which is useful in detecting the ambulance in 360 degree and controlling the 4 way traffic.This ensures no death in ambulance during all traffic circumstances.The system will respond much faster.

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