

INTELLIGENT TRAFFIC LIGHT CONTROL SYSTEM USING ARDUINO

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Abstract- The main objective of this paper is to provide an intelligent traffic light control system in order to avoid the traffic congestion and to give a free way to emergency vehicles to reach their respective places without any delay. This system uses IR sensors to detect the vehicles density before signal. This will help the Arduino to change the signal timing based on the number of vehicles. For traffic clearance, the radio frequency transmitter and receiver are used. To detect the emergency vehicles and will change the signal colour from red to green. Thus, this intelligent traffic light control system will help us to avoid traffic congestion and provide traffic clearance for emergency vehicles to reach their destination.

Keywords- ATMEGA 328 IC ARDUINO Microcontroller, FMTR-7R 27MHZ transceiver, IR sensor.

Introduction

In this modern era, usage of vehicle is more which leads the society to face traffic congestion and more

road accidents. If any emergency occurs at any time, the emergency vehicles should reach their respective places without any delay. If any emergency vehicles approaching traffic signal, if it is red signal, then time delay may occur. This may cause a loss of human life. So, to give the priority to emergency vehicles over traffic, this intelligent traffic light signal has been designed. In addition to this feature the operating time of traffic signal was controlled according to the number of vehicles standing before the signal. This will help us to reduce our traffic congestion and reduce our time consumption on standing before the signal. This system uses the ATMEGA 328 Arduino micro controller, IR sensors, Radio frequency receiver and transmitter is used.

Existing System

1. The author Dinesh Rotake Prof. Swapnili Karmore intelligent traffic light control system uses the old AT89S51 micro controller which is not flexible, less internal memory and less cost effective, which uses

the genetic algorithm to detect the number of vehicles.

2. The author Zhang Yuye, use AT89C51 which is not flexible and having less internal memory. CAN BUS controller is used will increase the cost. By use of the devices will leads to design very complicated. In our proposed system by using Arduino ATMEGA 328 micro controller will overcome all these limitations and less power requirement is required compared to AT89S51.

3. The author Shilpa S.Chavan , the operating time of traffic junction was fixed. It does not change according to the vehicles crowd standing before signal. For example if there is no traffic, the people will have to wait for some time until the traffic signal changes from red to green. For that they have use the GSM to find a solution. But it was not effective and has more complications. The proposed ITSC system solves this problem by using Arduino ATMEGA 328 micro controller with timer features, which changes the signal timing based on the vehicle density by using IR sensors.

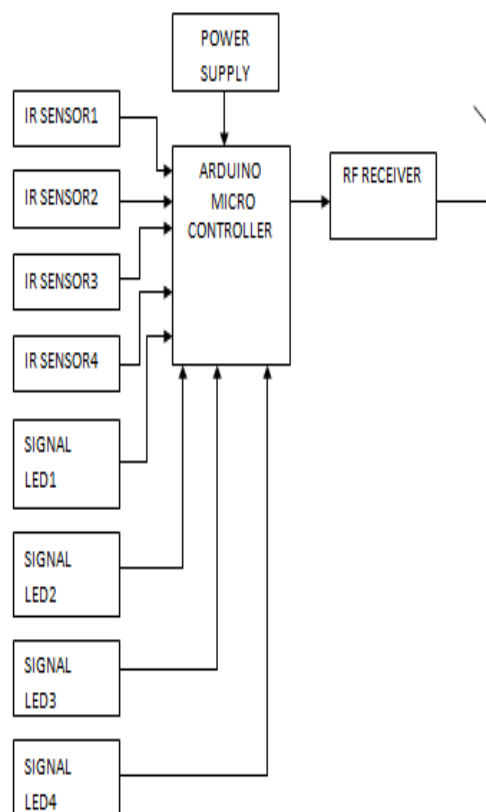
4.The author Ahmed S.Salamaet provide integrated intelligent traffic light system using photoelectric sensors distributed on long range before and after traffic light on

roads. Sometimes the traffic signal has to open immediately for emergency cases. This system is capable of opening for one emergency vehicle to cross the signals. But it does not more effective for more than one emerging vehicle coming from various side of signal. This drawback is overcome in our proposed system.

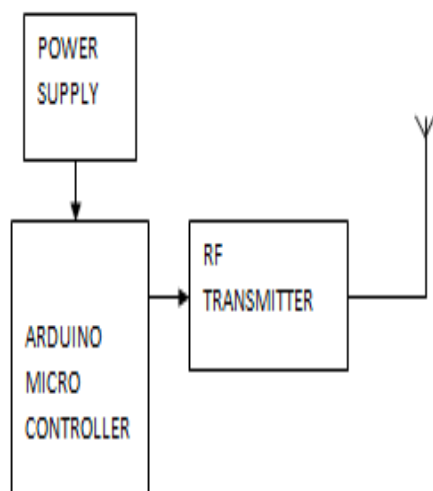
The rest of the paper is organized as follows. Section 2 gives the block diagram Section 3 described the proposed method and design.

Block diagram:

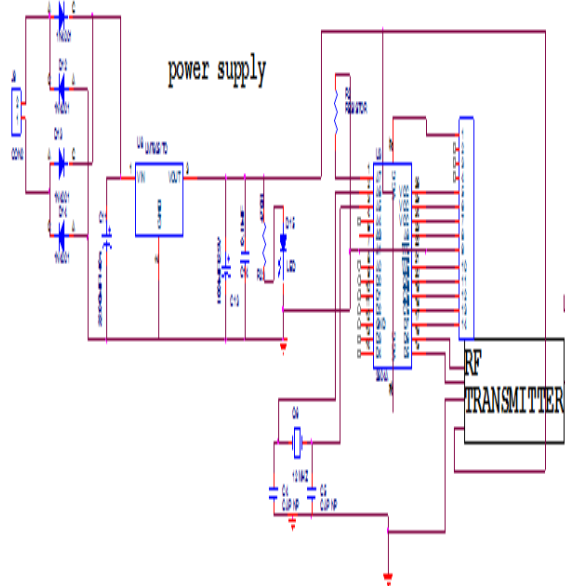
In traffic signal:



IN AMBULANCE SIGNAL:

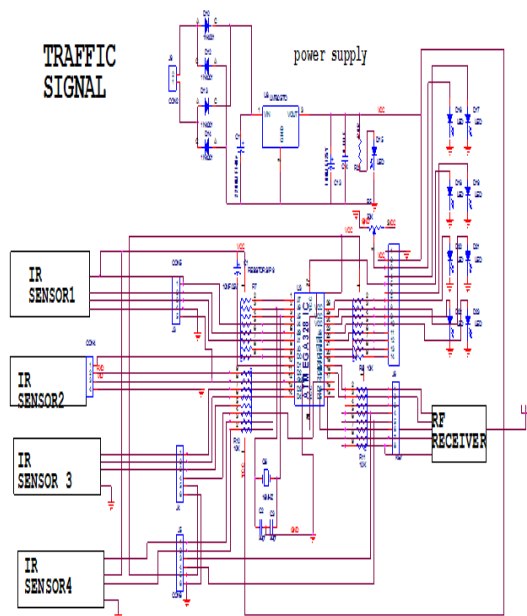


AMBULANCE SIDE



PROPOSED METHOD:

Circuit diagram:



In the traffic signal, the Arduino ATMEGA 328 micro controller is used. The power supply is given through the connector is from step down transformer. A transformer is used to step-down the AC voltage 230V to 12V. The stepped down AC voltage is converted into DC voltage using a bridge rectifier. An electrolytic capacitor is used as a filter. Voltage regulators are used to obtain the required voltage. Next the bridge rectifier is used to convert the ac supply to dc supply. Then it is given to voltage regulator which provides the constant dc voltage to the micro controller. Depending on the vehicles crowd the timing of the signals will change. The ARDUINO

was used to programme the micro controller having timing control features. The RF receiver is fixed in the traffic signal control system to get the IR signal from ambulance having RF transmitter. The ambulance which emits the radio frequency of about 27MHz, continuously from the RF transmitter.

Conclusion:

This paper is used to enhance the traffic light control system by clearing the traffic jam very quickly. This system helps the emergency vehicle by reducing the time delay. Hence if this system is utilised many lives will be saved.

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