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INTELLIGENT TRAFFIC LIGHT SIGNAL

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Abstract

Traffic lights play a major role in safety and efficiency in the field of transportation. Firstly, if there's no indication of who has priority at a junction, that has safety implications, especially if it's very busy and people get frustrated and tired of waiting, or if it's a high speed road with limited visibility. Using signals can make junctions safer by limiting vehicles exposure to conflicting phases, making junctions safer. Present traffic light is not real time based. It change the traffic signal based on fixed time. Due this there is unnecessary wastage of fuel because of large red light delay, in this paper the optimization of traffic light controller in a city by Arduino UNO and IR transmitter and receiver. IR sensors are placed on the either side of the road to count the number of vehicle passing. In view of check the microcontroller refresh the activity light flag. Can decrease the real activity issues.

Keyword: IR transmitter and receiver, Arduino UNO.

1. Introduction

This system is developed by using embedded system. It is used for controlling traffic light control signal based on density of vehicle. Microcontroller controls the IR sensor and count the vehicle density based on it the traffic light is get displayed. Here microcontroller stores the flash memory it update the memory as per the IR sensors reading.

Transportation has dependably a pivotal piece of human development. As there is an immense increment in number of vehicles, dealing with the activity turns into a keen errand. This paper gives brings about staying away from overabundance delays, advance security and lessen ecological contamination. System based on the radio frequency identification (RFID) technology in which it will be tracking vehicles and Electronic toll collection system will be implemented. But it has one major disadvantage that each vehicle has mount a one metal plate so cost of this system is very high. For that purpose this system is used.

2. Literature survey

A substantial number of methodologies are introduced to limit the issues of the activity light sticks, by writing review for

some arrangement over the most recent couple of years:

Sayali Ambekar, Shraddha Jawalkar, Anagha Patil, Shwetha Patil 2017 [1] presents system of intelligent traffic light controller using embedded system. It is used for controlling the traffic signal that is why it is used with roads, bikes and traffic. For this influenced utilization of making an hardware kit and server. In this project clustering algorithm that is K-Mean algorithm. It can also maintain the database using MySQL. With the help of IR sensors take vehicle count as input to system. According to vehicle count, this paper makes the decision time ranges for all signals. For implementing this system using hardware like 4 IR sensors, ADC, atmega8 microcontroller etc. and softwares like NetBeans, java language, MySQL database and glassfish server.

Mohammed Ehsan Safi 2016 [2] introduced Smart traffic light controller based on microcontroller. The system contains ultrasonic sensors on the side of the roads. Also the system contains switches to control the traffic light manually. The ultrasonic sensor system gets activated when vehicles go along the road against it. Different ranges of traffic light delay time intervals according to jam level are configured by Arduino UNO microcontroller and updated regularly. The

jam level displayer tool is another feature added to a system controlled by the microcontroller which is a traffic sign informs the drivers about the level of jam before reaching the road. .

G.Kavya, B.Saranya, 2015 [3] propose Density Based Intelligent Traffic Signal System Using PIC Microcontroller. The framework contains IR sensors are mounted on the sides of streets separately. The IR sensors network sense the vehicle passed through it. Microcontroller controls the IR framework and checks the quantity of vehicles passing out and about. The vehicle count is stored in microcontroller memory. Based on a different vehicle count, the microcontroller takes decision and updates the traffic light delays as a result.

Ganiyu R. A., 2014 [4] introduced a traffic light control system; the design consists of the microcontroller, and light emitting diode (LED). The sensing unit is designed utilizing a pressure switch which will sense the weight of any car that steps on it. When the pressure switch is pushed, a logic one is applied on the microcontroller to inform the control unit that there is car at that particular node. The system was designed to sample all the lanes in turn to detect whether there is an automobile on any lane and this action added a period of 15sec to the delay time by the

microcontroller which is configuring the traffic light action.

Sachin Jaiswal, 2013 [5] presented control system consist of microcontroller, IR sensors, in line of sight configuration across the loads to detect the density at the traffic signal, and for VIP automobile RF transmitters are installed on it while the receivers installed on traffic light control circuit to control the state of the traffic light. Three levels of jam and delays are defined high, medium, low density.

3. Proposed work

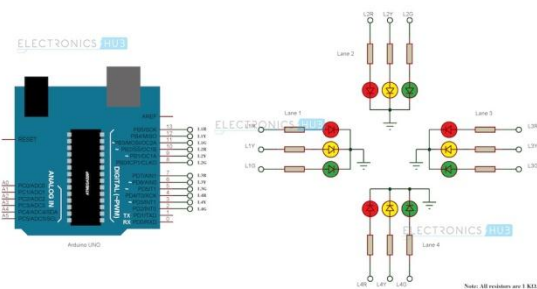


Figure1. System Architecture

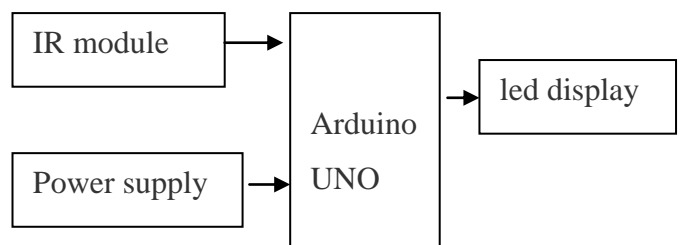


Figure2. Block diagram

IR sensor is an electronic device which senses the objects present around the surroundings. The principle is it transmits an infrared signal, this signal strikes the body of an object and the signal is bounced which is received at the infrared receiver. The system is less cost and efficiency is more because the IR sensors are used for counting the number of vehicles at each way of the junction. The Arduino UNO used is a simple prototype model which works more efficiently. As the IR sensors emits the IR radiations ,when an object crosses this sensor it will start to count the number of vehicles in each way and proportional output is given by the Arduino UNO board.

When the system work in the manual mode the traffic light work according to user (traffic policeman) choices using the manual control switches this mode is important, while the system be in the auto mode is determine the delay time of the traffic light according the sensors in the road by processing unit (microcontroller).

4. Advantages

- Maintenance cost is low
- Easily replaceable with traditional method of verification.
- Simplicity, user friendly, Easily programmable

- This system reduces the overheads on the database server, by using microcontroller it act as flash memory.
- This system is highly responsive that means it gives a quick response to change in traffic.
- This system reduces the waiting time as traffic signal's light will change according to current traffic density.
- It reduces the possibilities of traffic jams caused by traffic lights to an extent.

5. Conclusion

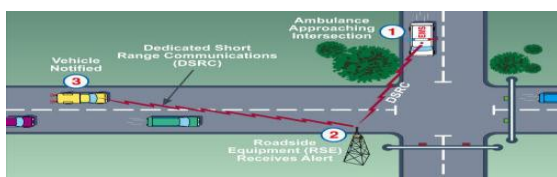
By using this system configuration can reduce the possibilities of traffic jams caused by traffic lights to an extent. The number of passing vehicles on the road decides the density range of traffics and on the basis of vehicle count microcontroller decides the traffic light delays.

This project is cost effective. Implementation of this project in present day will effectively solve the traffic congestion which is a severe problem in many modern cities all over the world. Consider a scenario of highly congested area where many vehicles such as personal transport, public transport and emergency vehicles have to wait for long for the change of traffic signals at intersection

points. This leads to the wastage of precious time especially in case of rescue vehicles for emergency conditions it is possible to propose dynamic time-based coordination schemes where the green signal time of the traffic lights is assigned based on the present conditions of traffic. This is achieved by using IR sensors across the road to monitor the length of vehicles blocking the road traffic. The signals from the IR receivers are fed to the microcontroller to follow the program with the time as desired. With a slight modification this project can be implemented in a nearby area.

6. Future scope

Proposed system will have wider future scope that, this system could manage traffic when any emergency vehicle comes. For example ambulance, fire bridged etc. And also user can get traffic information on mobile phone.



7. Reference

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