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DENSITY BASED TRAFFIC CONTROL SYSTEM

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Abstract- *The project is aimed at designing a density based traffic signal system where the timing of signal will change automatically on sensing the traffic density at any junction. Traffic congestion is a major problem in most cities across the world and therefore it is time to make an automated system with decision making mechanism. Present day traffic signaling system is fixed time based which is not effective if one lane has more traffic than others.*

To fulfill this problem we have designed a concept of intelligent traffic control system. Sometimes higher traffic density at one side of the junction demands longer green time as compared to standard allotted time We, therefore propose a mechanism in which the time period of green light and red light is assigned on the basis of the density of the traffic present at that time. This is achieved by using Infrared sensors. Once the density is calculated, the glowing time of green light is assigned by the help of the microcontroller (AT89s52). The sensors which are present on sides of the road will detect the presence of the vehicles and sends the information to the microcontroller where it will decide how long a the signal lights will remain green.

Keywords— *Traffic signals, Infrared Sensor, Microcontroller (AT89s52).*

1. INTRODUCTION

In today's day to day life traffic congestion becomes a serious issue. Due to this people waste their most of work time in traffic. Large number of vehicles, the poor infrastructure and the illogical distribution of the signaling system are main reasons for this congestion. It also increases pollution level as engines remain on in most cases, a huge volume of natural resources in forms of petrol and diesel is consumed without any effective outcome. Therefore, in order to overcome these problems or at least reduction in them , newer schemes need to be implemented by bringing in sensor based automation technique in this field of traffic signaling system.

2. LITERATURE SURVEY

Density Based Traffic Control

a) **Authors:** Er. Faruk Bin Poyen, Amit Kumar Bhakta, B.Durga Manohar, Imran Ali, ArghyaSantra, AwanishPratap Rao Dept. of Applied Electronics & Instrumentation Engineering, University Institute of Technology, Burdwan University, West Bengal, India.

Description : The project is aimed at designing a density based dynamic traffic signal system where the timing of signal will change automatically on sensing the traffic density at any junction. Traffic congestion is a severe problem in most cities across the world and therefore it is time to shift more manual mode or fixed timer mode to an automated system with decision making capabilities. Present day traffic signaling system is fixed time based which may render inefficient if one lane is operational than the others. To optimize this problem we have made a framework for an intelligent traffic control system. Sometimes higher traffic density at one side of the junction demands longer green time as compared to standard allotted time We, therefore propose here a mechanism in which the time period of green light and red light is assigned on the basis of the density of the traffic present at that time. This is achieved by using PIR(proximity Infrared sensors). Once the density is calculated, the glowing time of green light is assigned by the help of the microcontroller (Arduino). The sensors which are present on sides of the road will detect the presence of the vehicles and sends the information to the microcontroller where it will decide how long a flank will be open or when to change over the signal lights. In subsequent sections, we have elaborated the procedure of this framework.

b) **Authors:** Sakshi Pandey, Mittal Jethva, Sailee Jangam, Yashika Panwa, Department of Computer Engineering,Thakur Polytechnic, Mumbai, India

Description: The project is designed to manage the traffic signal or traffic light by estimating the density or number of vehicle on the road or lane. Traffic light or signal will automatically change by calculating the density. Nowadays traffic is the major issue in most of the cities so by applying this system we can control the traffic. The main objective of this project is to control the traffic lights or signal based on the density of the vehicles in particular lane.

In this system, IR sensors are used to evaluate the density of the vehicles which are fixed within a fixed space. All the sensors are incorporated with the microcontroller which in turn controls. The working or when to turn on/off the traffic signal or the signal light according to density detected by the sensors. If the traffic density is sky-scraping on particular side more priority is given to that side. The sensors incessantly keep sensing density on all sides and

the green signal is set to the side on main concern basis, where the sensors detect high density. The side with next priority level follows the first main concern level. By using this system traffic can be cleared without any worry and time delays even though there is no traffic on the other side can be avoided.

3. SYSTEM ARCHITECTURE

The below fig.1 and fig 2 shows architecture and block diagram of system. All the traffic signal related signals are interfaced with port 1 and port3 of microcontroller. IRsensors signals are interfaced with port0 and all LCD signal are interfaced with microcontroller.
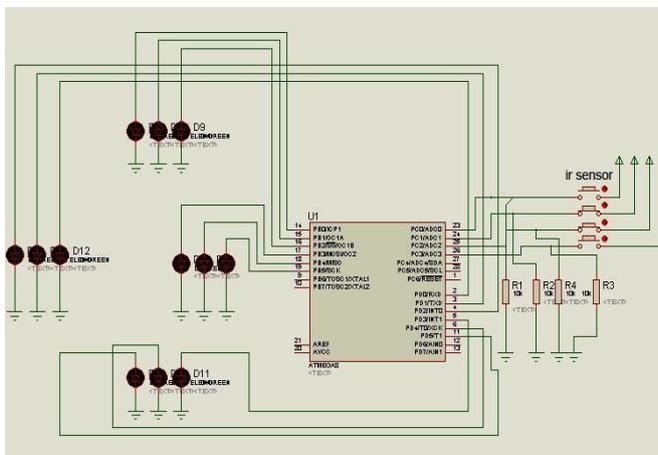
Fig 1. .architecture diagram   Fig 2.block diagram
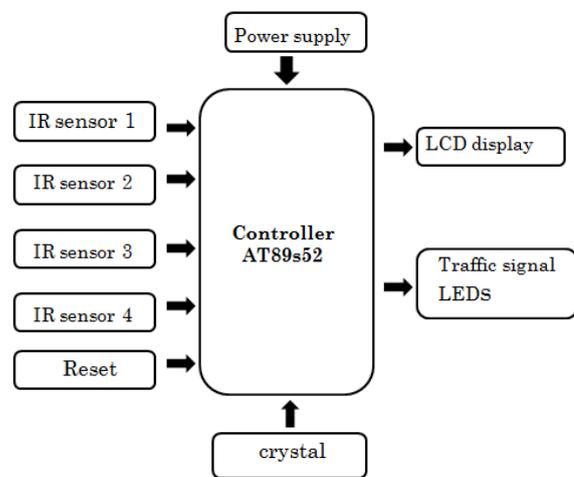
4. RESULT & ANALYSIS

The result includes successful operation of the system. The system contains IR transmitter and IR receiver (Photodiode) to measure the traffic density which are mounted on particular side of road. The IR starts sensing whenever the vehicle passes through the sensors. For normal flow the time allotted is of 5sec. If IR1 senses the traffic the time allocated will be 10sec (medium density) and if IR2 senses the traffic the time allotted will be 15sec (high density). Based on density of traffic microcontroller takes the decision and updates the traffic lights delay.

- **Case 1:** In this case there is no object present on any side of the road so the time flow for green light will be of 5sec.
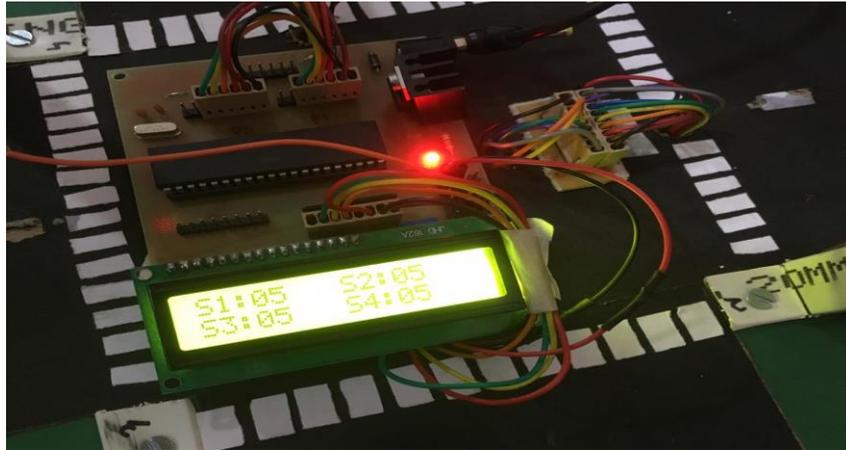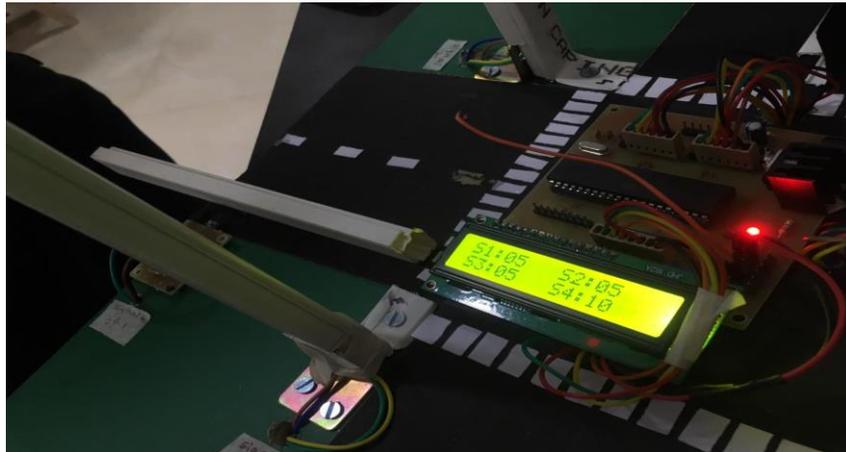
- **Case 2:** In this case the density occurs at road 1 i.e. medium density so the time for green light of road 1 will be increase to 10sec.
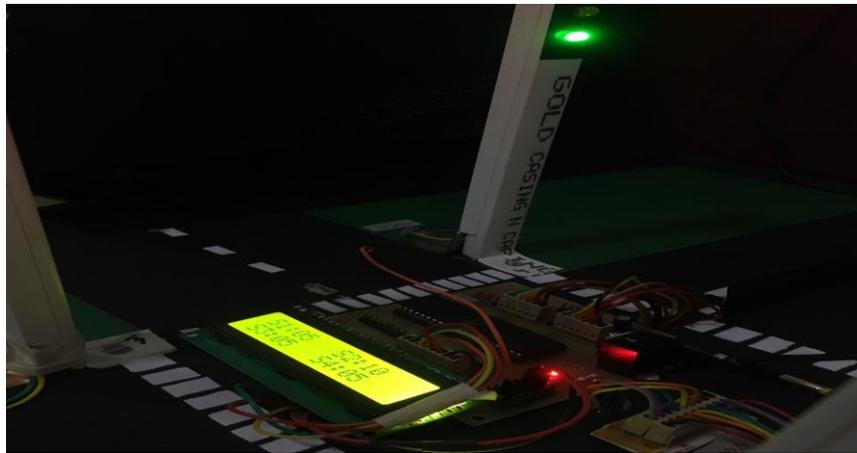

- **Case 3:** In this case the density occur at road 2 if the traffic crosses the first IR then the traffic density is medium and time allotted for green signal is 10sec and if the traffic crosses the second IR then the traffic density is high and time allotted for green signal is 15sec.
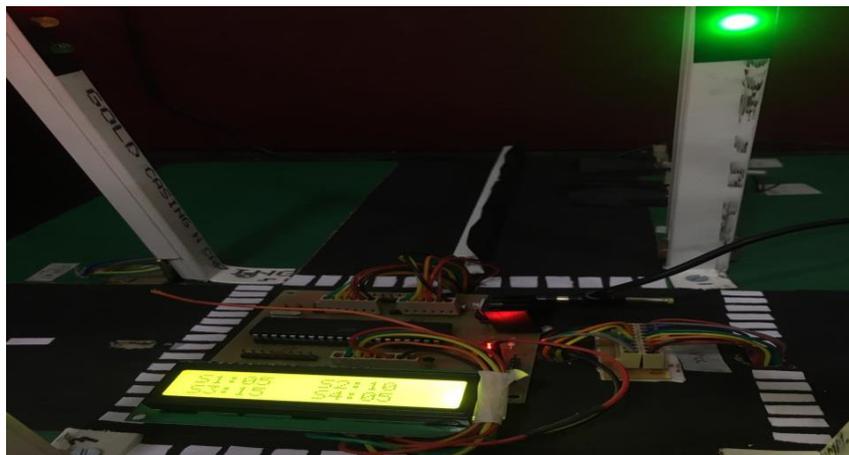
- **Case 4:** In this case the density occurs at road 3 i.e. medium density so the time for green light of road 3will be increase to 10sec

- **Case 5:** In this case the density occur at road 4 if the traffic crosses the first IR then the traffic density is medium and time allotted for green signal is 10sec and if the traffic crosses the second IR then the traffic density is high and time allotted for green signal is 15sec.
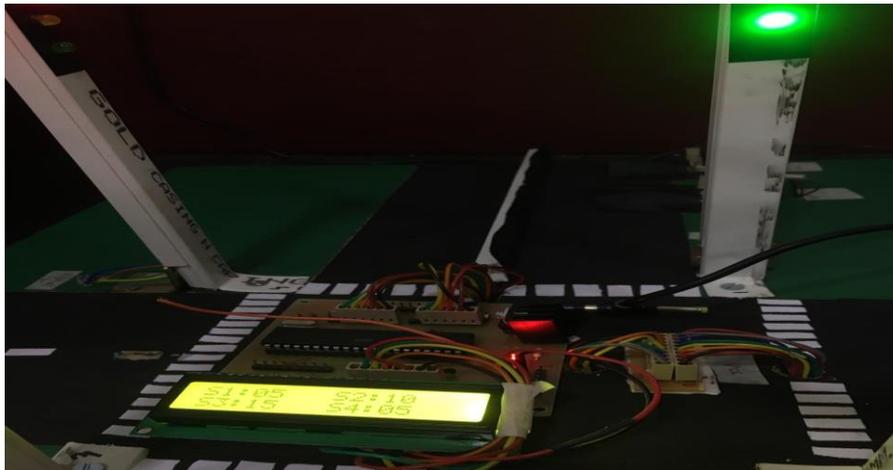
5. CONCLUSION

There is urgent need of efficient traffic management system in our country as India meets 400 road accident every day .In this system we have worked on traffic congestion problem where the traffic density is high. We have successfully implemented this application on small scale with a proper outcome. We are looking further to implement this in our real life scenario.We hope that our system will help to reduce the traffic and will bring a revolutionary change in traffic management system.

6. FUTURE SCOPE

- Real time traffic information update on traffic department web server.
- Automatic tracking of defaulters.
- Detection of emergency vehicle.

7. ACKNOWLEDGMENT

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