International Journal of Research in Engineering, Science and Management
Volume-2, Issue-5, May-2019
www.ijresm.com | ISSN (Online): 2581-5792

Traffic Control System using barrier for Smart Cities

Ashwini Kanade[1], Mayuri Yadav[2], Prajakta Ghorpade[3], P. J. Katkar[4], Y. S. Angal[5]
[1,2,3]*Student, Department of Electronics & Telecommunications Engineering, JSPM's Bhivarabai Sawant Institute of Technology and Research, Pune, India*
[4]*Professor, Department of Electronics & Telecommunications Engineering, JSPM's Bhivarabai Sawant Institute of Technology and Research, Pune, India*
[5]*Professor & HoD, Department of Electronics & Telecommunications Engineering, JSPM's Bhivarabai Sawant Institute of Technology and Research, Pune, India*

***Abstract*: In cities there is traffic is a major issue. Due to a severe amount of traffic a lot of time spent on Due to traffic people get late for their office or any work which directly affect the economy of that region.to avoid the late entries people can break the traffic rules in the signal. It causes the accident therefore this project gives a new idea about how to avoid an accident on signals.in this project, there is Arduino UNO 2586 used to operate the barrier this system can be applied in an area having a crossroad.**

***Keywords*: Arduino Board, IR Sensor, Servo Motor**

1. Introduction

Traffic is a major problem in cities because people can use their own vehicles for traveling. Due to this reason, road accident is a common sight in many cities. People don't follow the traffic rules. stopping for a red signal is not mandatory for them. They can cross the signal when the red signal comes up and cause accidents.

To overcome this problem, we thought of the new system of traffic management .in this we give the idea of blocking the road by using barrier on the road when the red signal comes up.in the system consists of LIDAR deployed when an ambulance, fire Bridger is coming at signal then the signal at this side can be released.

2. Research methodology

1) A microcontroller based Traffic control system is introduced which will make the drivers bound to follow the traffic rules by controlling traffic system. This system decreasing the rate of accident in day to day life, controlling crowd, lowering the tendency of road blocking. Which is given from Design of an Intelligent Traffic Light Control System on Gezira Journal of Engineering and Applied Science [volume 6, No.1]

2) For effective Traffic Control using a micro basic program written in Basic language. The developed traffic light control system is tested by constructing a prototype that resembles the real application. The functionality of the prototype shows that the developed system can be used for a real life traffic control at road intersection. Which is given in Development of A Microcontroller Based Traffic Light System For Road Intersection Control on International Journal Of Scientific & Technology Research [Volume 3]

3) Wireless Sensor Networks (WSN) have been increasingly involved in Intelligent Transportation System (ITS) optimization, especially in dynamic management of signalized intersections. Which is given in M. Collotta, G. Pau, G. Scat`a, T. Campisi, A Dynamic Traffic Light Management System Based On Wireless Sensor Networks for the Reduction of the Red-Light Running Phenomenon, Transportation and Telecommunication [volume 15, No.1]. This paper discusses the state of art and shows an IEEE 802.15.4 network architecture to monitor vehicular traffic flows near to a traffic light.

3. System design

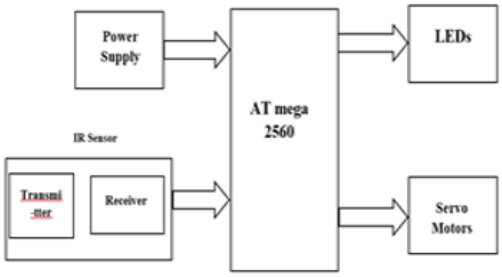

Fig. 1. Block diagram

This consists of ATmega2560 Microcontroller, Motor Driver IC's, Dc Motors, LEDs, IR sensors, barrier. The traffic signals are controlled using ATmega8 microcontroller. In all there are four signals which consist of RED, GREEN and YELLOW LED's. All signals working as per their standard. Initially any of them is on that is Red on for some time where all vehicles stop. After Red for some time Yellow ON. At last Green on then all vehicles are allow to cross signal. The servo motors are connected to the controller. When the traffic signal becomes red the servo motor starts rotating and the panel comes up and

blocks the roads and prohibits vehicles on moving further. When the signal becomes yellow the servo motor starts rotating in opposite direction and this brings the panel down. When the signal becomes green the roads are finally free and vehicles start moving. This cycle repeats on all roads thus preventing the accidents.

The emergency will occur any way, any time and on any location. In that case the fast response is required. The number of vehicles using the limited road networks infrastructure which was slowly increased. One of the most traffic problem is the delay of emergency vehicles such as, ambulance to reach hospitals on time, Fire brigade vehicles, police van and VIP (minister) vehicles. There are traffic jams occur on main way in special seasons and working hours. It leads to a long waiting time of peoples and high cost of fuel consumption on the road. During that delay the Emergency vehicles are stuck in traffic jams.

In this all signals working is same as other signal works. There are four signals at each junction. Additionally, IR sensor setup is there for emergency vehicles. IR sensor woks continue. servo motors are used for lifting up and down barriers. Due to barriers whole way to cross junction is blocked. Hence there is no signal jumping.

4. Process development

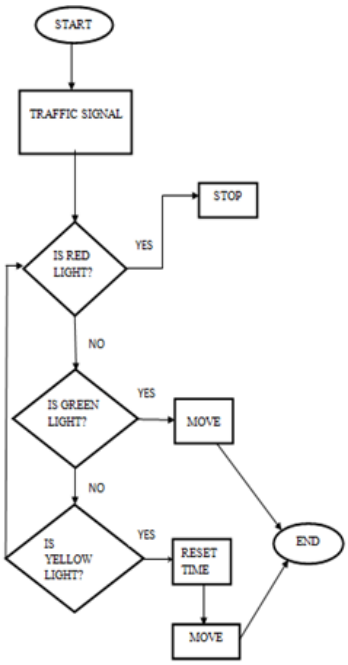

Fig. 2. Flowchart of process development

When the system is on the LED's are glow. When the red signal occurs then the traffic will be stop. After sometime green signal occurs then the road is free for vehicles. When yellow signal occurs then people are alert for red signal.

when the red signal is on and any emergency vehicle can come. then this side signal can be directly on the green signal. this side road is free to move for vehicles.

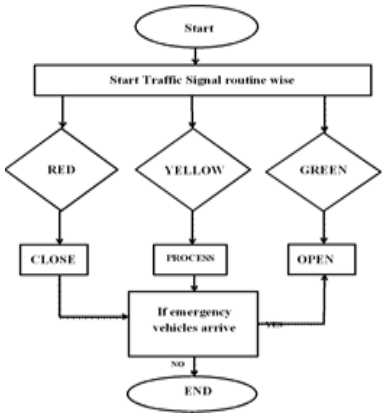

Fig. 3. Flow chart

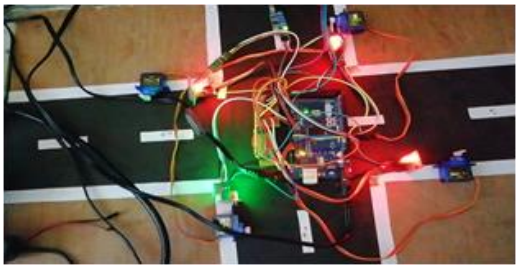

Fig. 4. Hardware setup

5. Conclusion

This work provides an idea about the traffic control by the barrier. As servo motor is preferred here because it gives the angular deflection as compare to DC motor.

References

[1] S. S. Chavan, R. S. Deshpande and J. G. Rana, "Design of Intelligent Traffic Light Controller Using Embedded System," *2009 Second International Conference on Emerging Trends in Engineering & Technology*, Nagpur, 2009, pp. 1086-1091.

[2] Ganiyu R. A., Arulogun O. T., Okediran O. O, "Development of a Microcontroller-Based Traffic Light System for Road Intersection Control," in International journal of scientific & technology research, vol. 3, no. 5, May 2014.

[3] M. Collotta, G. Pau, G. Scat`a, T. Campisi, A. Dynamic, "Traffic Light Management System Based On Wireless Sensor Networks for the Reduction of the Red-Light Running Phenomenon," in Transportation and Telecommunication, vol. 15, No. 1, pp. 1-11, 2014.

[4] Sarika B. Kale, Gajanan P. Dho, "Design of Intelligent Ambulance and Traffic Control," International Journal of Innovative Technology and Exploring Engineering, vol. 2, no. 5, April 2013.

[5] S. Djahel, M. Salehie, I. Tal and P. Jamshidi, "Adaptive traffic management for secure and efficient emergency services in smart cities," *2013 IEEE International Conference on Pervasive Computing and Communications Workshops (PERCOM Workshops)*, San Diego, CA, 2013, pp. 340-343.

[6] E, Geetha, V. Viswanadha, and G. Kavitha, "Design of an Intelligent Auto Traffic Signal Controller with Emergency Override," in International Journal of Engineering Science and Innovative Technology, vol. 3, no. 4, pp. 670-675, July 2014.

[7] Datasheet L293d Quadruple Half –H Driver, Texas Instruments

[8] Data Sheet LM7805 Series Voltage Positive Regulator, Texas Instruments.