

Traffic Signal Intimator using IOT

S. Mounika A. Sandhya Lakshmi M. Bhavana K. Siva sai G.L.N. Suresh

Abstract (10): All metropolitan cities face traffic congestion problems especially in the downtown areas. Normal cities can be transformed into “smart cities” by exploiting the information and communication technologies (ICT). The paradigm of Internet of Thing (IOT) can play an important role in realization of smart cities. This proposes an IOT based traffic signal solutions for smart cities. Now a days we are seeing and listening accidents near traffic signals due to over speed. Because they don't know which signal light is currently there. So, to overcome this problem we want to design a mobile application. In that application it will show the colour of the signal and time limit of the signal with the help of this the driver can decrease the speed or increase the speed. So we can reduce the accidents and we can consume the fuel. This will display when a driver is 500mts away from the traffic signal. However the scheme proposed is general and can be used in any Metropolitan city without the loss of generality.

Keywords: Internet of things, traffic intimator, ESP32, IR sensor.

* Correspondence Author

S. Mounika, Assistant Professor, Department of CSE,
Usha Rama College of Engineering and Technology,
India,

Email:mounikasunkara95@gmail.com

A.Sandhya Lakshmi, Department of CSE,
Usha Rama College of Engineering and Technology,
India.

Email:sandhyaddepalli@gmail.com

M. Bhavana, Department of CSE,
Usha Rama College of Engineering and Technology,
India,

Email:mbhavana0510@gmail.com

K. Siva Sai, Department of CSE,
Usha Rama College of Engineering and Technology,
India,

Email:sivasaikannikanti@gmail.com

G. L. N. Suresh, Department of CSE,
Usha Rama College of Engineering and Technology,
India,

Email:gudivadasuresh1999@gmail.com

Traffic Signal Intimator using IOT

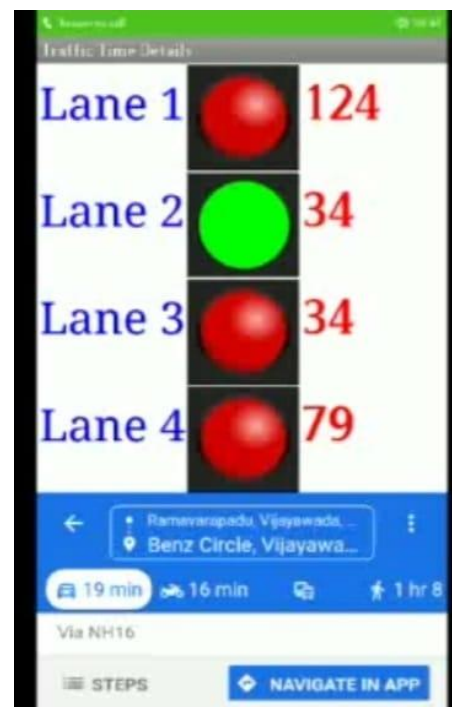
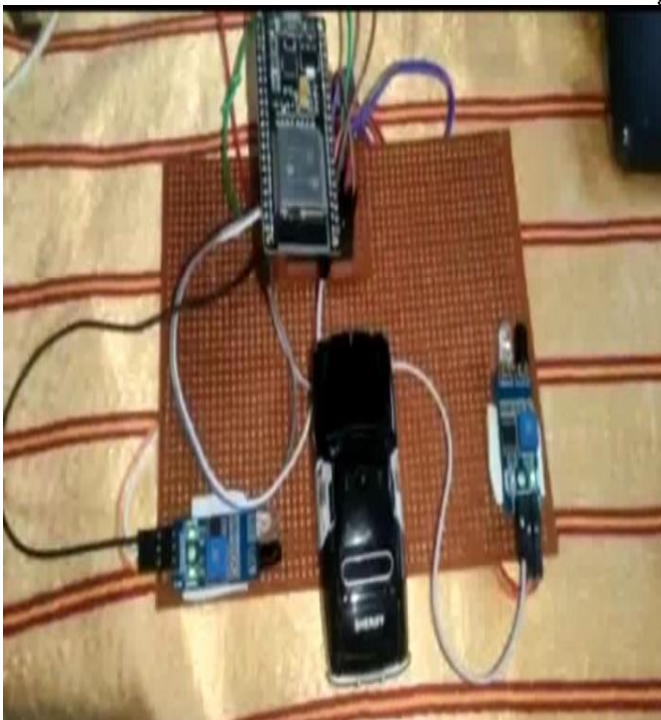
1. INTRODUCTION

A traffic signal is used as an instructing device that indicates the road user to act according to the displayed sign. Following the traffic signal ensures road safety and to make things simple to understand, these signals have been using a universal colour code. Traffic signals are given out by devices that are mostly placed at important locations such as busy intersections to regulate the flow of traffic, which includes everything from heavy commercial vehicles and cars to bicycles and pedestrians. However, these signals come with some rules associated with them. Basically, the traffic signal rules form the very backbone of these signs and following them is vital for ensuring smooth and risk-free road travel. All metropolitan cities face traffic congestion problems especially in the downtown areas. Normal cities can be transformed into “smart cities” by exploiting the information and communication technologies (ICT). The paradigm of Internet of Thing (IOT) can play an important role in realization of smart cities. This proposes an IOT based traffic signal solutions for smart cities. IoT is a concept where an object is assigned to an IP address and through that IP address we make that device identifiable on internet. A Team of International Telecommunications Union defined IoT as a global infrastructure for the information society, enabling advanced services by interconnecting (physical and virtual) things based on existing and evolving interoperable information and communication technologies. The network can be a combination of people-things, things-things and people-people. It happens only because of the conjugation of various technologies such as wireless communication, Micro Electromechanical System that includes wireless sensor, networks and control system. The most important elite presence of cloud space on Internet is shaping the architecture of IoT in a feasible and rational form. Certainly, what IoT can do is beyond imagination. It connects plethora of heterogeneous object A smart traffic management system utilizing sensor data, communication and automated algorithms is to be developed to keep traffic flowing more smoothly. The aim is to optimally control the duration of green or red light for a specific traffic light at an intersection. The traffic signals should not flash the same stretch of green or red all the time, but should depend on the number of cars present. When traffic is heavy in one direction, the green lights should stay on longer; less traffic should mean the red lights should be on for longer time interval. This solution is expected to eliminate inefficiencies at intersections and minimize the cost of commuting and pollution.

2.DESIGN

In this project we are using ESP32 module and IR sensors. ESP32 module can interface with other systems to provide Wi-Fi and Bluetooth functionality. IR sensors are used to detect the objects. First we trained the ESP32 module and then we connected the IR sensors to the ESP32. IR sensors are fixed at the traffic signal poles. When ever the object detected the ir sensor will send information to the esp32 and then it will show the green light to that lane. Because in that lane the traffic was heavy so, that’s why the sensor sent the information and remaining lanes will be in red light.

Figure



3.ANALYSIS

We have to collect all the devices and have to place the devices in the respective places i.e., IR sensor must place on the traffic signal pole. Near the pole we have to place the esp32 module and in every areas open wi-fi must be there.

Now if any vehicle is detected in front of the IR sensor and then it will send information to esp32 that this lane is busy so, now you have to light the green color like that all the ir sensors will send information to the esp32. Now the esp32 will check the vehicle count. If the vehicles are high in another lane then it display the green color to that particular lane and remaining lane will be in red color. And this data will be stored in the database and from database the data get retrieved and then it will send to cloud and from the cloud the data get retrieved and then it will sent to our mobile application. So that every user can know the traffic signal color of the lane if they give gps permission in our mobile application. And we added another feature i.e., if any lane is empty then that lane becomes red and remaining and the corresponding lane become red signal. Because, user don't want to wait in the traffic for the long time. So, with the help of our mobile application we can reduce the accidents and we can reduce the users destination time limit. If there is red signal in the lane which they are going so they choose another path this way we will help our users.

4.RESULTS

We have got the better results by making some of the test cases. After making all these connections we have tested. The tests we have done are, First we have placed the vehicles in all the lanes and we observe that it shows the green signal which have high count in our mobile application. And the second time we removed the vehicle from lane1 and we observed then it shows the red signal in the lane1 and showed green signal for lane2 in our mobile application because it has vehicles. The user must not wait at the traffic signal because they have to reach the destination within the short time. And for the 3rd time we removed the vehicles in both the lanes i.e., lane1 and lane2 at that we have seen in our mobile application that it displays the red signal for both lanes and it showed the green signal for the lane3. Like this we have tested each and every test case and we got the better results.

5.CONCLUSIONS

Traffic issues cause not just inconvenience but also impacts economically. Traffic congestion issue can be solved by multi-pronged approach. As the population of the modern cities is increasing, the vehicular travel is also increasing leading to congestion on roads. Nowadays All metropolitan cities face traffic congestion problems especially in the downtown areas. Metropolitan police have lots of responsibilities including controlling law and situation. The traffic control department implement traffic signal system where the lights will be on or off to reduce the accidents. Even though more accidents are occurring near traffic signal due to over speed. Most of the vehicles are going over speed near the traffic signals because they don't know which color signal and time limit is currently running in that particular lane and also also they are not reached to there destination in time because of traffic congestion and also fuel consumption is high. So to over come this problem we programmed a traffic signal intimator using iot through mobile app in that application we can display the traffic signal color and time limit in that there particular lanes. So vehicles are going normal speed because they know the traffic signal color and time limit in that there particular lanes. so we can reduce the accidents and reach our destination in time and we can reduce the fuel consumption and environment pollution also. In our project we can use simple traffic light system for a 4 way intersection is implemented using ESP32 Module. Although it is not the practical implementation for real life scenarios, it gives a general idea of the process behind the traffic light control system. Simple traffic light intimator is made using ESP32 Module, where the traffic lights are intimated based on programmed timings. In our mobile application, we will display signal color and time. In our mobile application we can use google maps for knowing the route. The traffic signal color and time will change based on the heavy traffic. By using this system configuration we can reduce the possibilities of traffic jams and accidents caused by traffic lights to an extent. We can know the waiting time and if possible we can go in other directions to meet the destination point.

REFERENCES

- [1] Li Z, Shahidehpour M, Bahramirad S & Khodaei A, "Optimizing traffic signal settings in smart cities", IEEE Transactions on Smart Grid, Vol.8, No.5, (2017), pp.2382-2393.
- [2] Singh L, Tripathi S & Arora H, "Time optimization for traffic signal control using genetic algorithm", International Journal of Recent Trends in Engineering, Vol.2, No.2, (2009),pp.4-6.
- [3] Pable SN, Welekar A & Gaikwad-Patil T, "Implementation on Priority Based Signal Management in Traffic System", International Journal of Engineering Research Technology (IJERT), Vol.3, No.5, (2014), pp.1679-1682.
- [4] Milanés V, Villagra J, Godoy J, Simo J, Pérez J & Onieva E, "An intelligent V2I-based traffic management system", IEEE Transactions on Intelligent Transportation Systems, Vol.13, No.1, (2012), pp.49-58.