SOLAR POWERD INTELLIGENT STREET LIGHTING SYSTEM FOR HIGHWAY APPLICATION

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ABSTRACT

With the increased energy crisis and global warming, energy saving is inevitable with proper selection of renewable resource. The proposed system relies on effective use of solar energy to drive the street lights. Infrared (IR) sensor is employed in design for detecting density of vehicles and atmospheric lighting conditions. Light Emitting Diodes (LED's) are employed for lighting purpose. The system is developed using Raspberry Pi, it is a controller for interfacing camera, power supply, proximity sensors, etc. Image processing is used for identifying the numbers and characters on the number plate of the vehicles. Traffic management system is considered as one of the major dimensions of a smart city. With the rapid growth of population and Urban mobility in metropolitan city, traffic congestion is often seen on roads. To tackle various issues for managing traffic on roads and to help authorities in proper planning, a smart traffic management system using machine learning is proposed in this system. People don't fallow signal rules and break the signals that's why this system is designed to know by which vehicle the signal is broken. And the number plate is captured using camera. The numbers and characters are recognized using camera and image is processed. And the message is sent on the cloud.
Keywords: Machine Learning, Camera, Raspberi pi, IR, Traffic control, Number Plate detection.

ARTICLE INFO

I. INTRODUCTION

We Traffic congestion leads to long and unpredictable commute times, environmental pollution and fuel wastage. These negative effects are more acute in developing countries like India, where infrastructure growth is slow because of cost and bureaucratic issues. Frustration with the traffic lights results in an increase in accidents from cars moving when the traffic light, signals them to stop.

Intelligent traffic management and better access to traffic information for commuters can help alleviate congestion issues to a certain extent. The traffic lights ensure that vehicles from every direction get a chance to proceed through the intersection in an orderly fashion. Normally, we will have the traffic signal lights programmed for particular time intervals. But, in day-to-day life we observe that traffic on one side on a two-way road is predominantly more when compared to the other. In such a situation programming equal intervals of time for both types of traffics, attributes to congestion during hours of heavy traffic, making traffic delays. But, here we propose a system that generates the traffic light signals based on the vehicle density, contrary to the old method of allotting the same time intervals to all roads irrespective of their traffic density. This type of traffic light signaling system is nowadays used in all the metropolitans. In this method to monitor traffic, the density of traffic is

measured by various sensors; these sensors are placed on either sides of the road.

In this system a new methodology is described to efficiently handle and managed traffic in a highly populated and congested area. The traffic management system's framework make use of an essential technology required which is IoT. It also has other important parts such as an autonomous activity controller raspberry-pi, pi-camera, PIR sensors, solar panel, battery. Raspberry pi is used to manage all components collectively and individually. Total traffic in a region is determined by the help of IR sensors which uses to distinguish high density vehicles way from day to day traffic. There is an additional benefit of using camera it can be used to locate the robbed or snatched vehicles. The proposed framework has two major parts i.e autonomous and manual. The algorithm used to navigate traffic play a vital part in making the proposed framework work efficiently.

II. PROBLEM STATEMENT

Last few Decades the traffic management it's the vital issues in a big cities. With the help of Internet of Things (IoT) we can improve the traffic efficiency. In this system we describe the things using Internet to control the traffic well. Last few decades the major problem is increasing number of vehicles as same as growth of population because of it causes major traffic congestion, noise and increase travelling time due to this congestion of traffic is increases along with increase the pollution every day on road traffic is jammed. In this we can manage the traffic signals by monitoring the traffic density to avoid traffic congestion on road using network communication between server and hardware module.

III. LITERATURE SURVEY

[1] Wei Shao and Ling Chen, License Plate Recognition Databased Traffic volume Estimation using Collaborative Tensor Decomposition, In this paper, system is used to estimate the traffic volume data on the roads. With increase in number of vehicles it has become mandatory to keep a record of the vehicle density. Which road/path faces higher traffic volume data so accordingly the future road directions can be planned.

[2] Sabeen Javaid, Ali Sufian, Smart Traffic Management System using IOT, In this paper Traffic management is considered as one of the major dimensions of a smart city. To tackle various issues for managing traffic on roads and to help authorities in proper planning, a smart traffic management system using the Internet of Things (IoT). The system is developed using camera and sensors. The main aim of the system is to prioritize the emergency vehicles on busy roads, thus by making help available to the needy as soon as possible

[3] Ms. Aarthy D K, S. Vandanaa, M. Varshini, Automatic Identification of Traffic Violation and Theft Avoidance, The main purpose of this paper is to provide high level security. As we know violating traffic rules have become predominant on Indian roads. Because of this carelessness many people lose their life. .So to overcome this, the proposed system uses RFID technology to deal with the traffic problem. The major components of this proposal are RFID reader, camera, Tag and a database server.
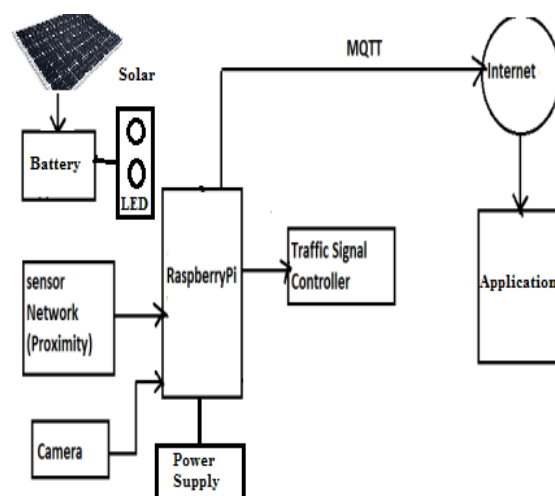
IV. BLOCK DIAGRAM

Fig 1. Block diagram

System Development:

1. Module 1(get sensor data) -
   In this module input is traffic density sense by the sensor and the output is digital data produced by the sensor data which is send to next module for further operations.

2. Module 2(perform analysis)-

The input for this module is digital data sensed by sensor and output is decision taken based on sensor data.

3. Module 3 (traffic signal and rerouting)-

The input for this module is data or decision data produced after analysis and output of this module is new value of signal countdown.

4. Module 4(send data on cloud) –

In this module data will be send on cloud. Input is the data which will be sent on cloud and the output is data stored on cloud.

5. Module 5(Number Detect) -

In this module camera take input number plate image stored and the output is number Recognisation for traffic signal break vehicle.

V. RESULTS

Whenever number of vehicle exceeds broking signal the captured image is converted into grey scale image, where it undergoes dilation and edge detection, and later is stored in database. SMS alert is generated to the monitoring person.
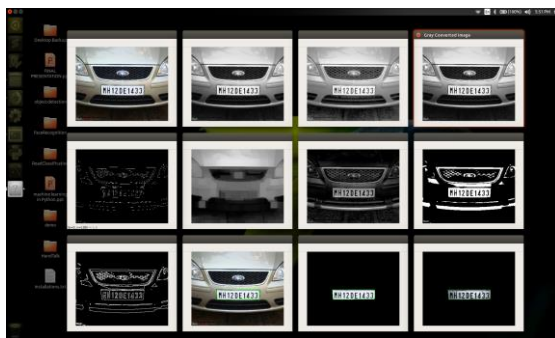

fig 2. Number plate detection

VI. CONCLUSION

Here we conclude our system uses the raspberry pi with camera technology and sensors to detect and take right actions against the person violating the signal rules. if any vehicle break the signal then camera capture the vehicle. We also control the traffic using the sensor.

REFERENCES

[1] Wei Shao and Ling Chen,"License Plate Recognition Databased Traffic volume Estimation using Collaborative Tensor Decomposition",(IEEE 2018)

[2] Sabeen Javaid, Ali Sufian,"Smart Traffic Management System using IOT",International Conference on Advanced Communication Technology(ICACT),2018.

[3] Takkedasila Johny, M. Maruthi Prasad Reddy," RFID and Number Plate Based Two Level Authentication System for Vehicles" ijmetmr,2015.

[4] Ms. Aarthy D K, S. Vandanaa, M. Varshini, "Automatic Identification of Traffic Violation and Theft Avoidance", International Conference on Science Technology, Engineering and Management(ICONSTEM),(IEEE2016)

[5] Dhiraj Y. Gaikwad Pramod B. Borole, "A Review Paper on Automatic Number Plate Recognition (ANPR) System", International Journal of Innovative Research in Advanced Engineering (IJIRAE) Volume 1 Issue 1 (April 2017).