

International Journal of Computer Science and Mobile Computing



A Monthly Journal of Computer Science and Information Technology

ISSN 2320-088X

IMPACT FACTOR: 7.056

IJCSMC, Vol. 9, Issue. 5, May 2020, pg.84 – 89

SMART STREET LIGHTS

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Abstract– The main scope of this paper is to enable the lights of system only when the system detects the movement of an object. By this we can save much more energy. The most necessity of our nation is to reduce electricity consumption probably by street lights. Because street lights will be switched on for the whole night. This electric energy consumption can be greatly reduced by this smart or automated street lights. The widely sensors were used in order to detect the objects. In order to achieve this technology, it includes lamp unit and sensor unit. Lamp unit is used to detect the moving objects whereas sensor unit is used to send the message to several devices that has been connected with these units. The common communication devices named as controller that has been connected with both the lamp unit and sensor unit. With the help of these techniques, the street lights will be switched on only when there is movement of objects and it could have simultaneous operation on switched off.

Keywords: Lamp unit, sensor unit

I. INTRODUCTION

Nowadays, more electrical energy is wasted by means of automated street lights. These kinds of street lights will switch on automatically when it is dark and switch off when it is bright. In other way it also works under some prescribed timings. That means it will switch on when it reaches that particular time and automatically it will switch off when it reaches that allotted time. But it consumes more electrical energy and also some manual operations are needed. In order to reduce all these manual operations and more energy consuming we are focused on smart street lights. This smart street lights will work accordingly the moving objects. The street lights will be

switch on only when there are any moving objects near to lights. Otherwise it will turn off. By this technique we can save energy and also reducing the manual operations. To determine the moving objects the sensor device must be used. Both the sensor light and motion sensor can be used to turn on light and to detect moving objects respectively. So the street lights will be turned on for a while until the moving objects went far away. But in this technique we are facing one issue regarding that it will turn on only when the object come closer to light. This issue is in under process to sort out. Some centrally controlled Smart Street lights have been developed with the host computers by some colleges and universities. This technique is suitable to a large area and the newly developed area based on the total plan.

II. LITERATURE SURVEY

According to Tatavarthy Santhi Sri, in order to achieve the power utilization, smart street lights have been developed. Robotization is used to control the entire technique and also to reduce the manual operations. This is due to programmed frame works are well worked than the human framework. So it is better to automate the street lights by the machine framework and even smart road lights. The street lights turn off naturally when there is no movement of vehicles or even any humans. IR(infrared motion sensor),LDR(Light dependent resistor),LED(light emitting diode),HID(High intensity Discharge lamps) are the sensors which used in this paper.

According to Parkash Tambare, a new design and execution of energy saving automated street lights has been developed. But they have focused mainly on energy saving and that could be determined absolutely by turning on the lights only when there is dark. Currently the street lights will be turn on at the prescribed time. But in this paper they developed the smart street light only when there is dark and not on prescribed time. The embedded system technology has been used and more sensor operations takes place in order to detect the moving objects and to turn on or off the lights. The timings to turn on and off can be controlled by the internet through the IOT technology. And also this technique may reduce the human operations.

According to Siddarthan Chitra Suseendran ; Kishore B. Nanda ; Josephus Andrew ; M. S. Bennet Praba , this paper aims at making the street light to dim and brighter whenever it is needed. This particular technique is based on IOT and some sensors have been used to reduce more electricity consumption and also the manual operations. This paper is also focused on reducing the accidents and to provide a safe environment.

According to M.PriyaDharsini, the street lights are not so efficient in saving the power so as to bring the necessity of developing the automated or smart street lights and that could be used more efficiently in developing nations. Parts of the light will be turned on in the entire street, parts of the light will be turned off. That means the light will be turn on and off only when there is moving objects. The other parts of the light will not be turned on in the same street. Based on the number of vehicles and weather conditions the intensity of lights will be changed accordingly.

According to DongJin, centralized and remote technology will be enabled with the help of wireless networked LED lighting system has been used in this paper. In order to achieve a innovative smart city this smart street light system must be used. This will reduce the power consumption and also it will provide public safety.

According to Chetna Badgaiyan, based on wireless sensors network and pyro electric infra red sensors, an intelligent street lighting system has been introduced. This system also be developed using zigbee device. The main goal of this paper is to develop a save power and to make street smart.

III. EXISTING SYSTEM

In existing system, the EB Controlled street light and Automatic street light using LDR were used. The main focus in existing system is to switch on and switch off the light when it is not used. But we are planning to do make the light to dim and bright in light intensity, so that it will reduce the power consumption somewhat and also it will reduce the manual operations heavily.

IV. PROPOSED SYSTEM

(a) Lamp unit:

The communication device such as zigbee module and the controller has been used in this unit. In addition to that power adjustable LED array, sensor lights, motion sensor also been used. A motion is determined by motion sensors and it could be defined in the particular area which includes its own sensors lights. Then, it will broadcast the message to all other device. If there are no any movements in that particular area, it will turn off or it might be reduced power like making light to dim.

(b) Sensor unit:

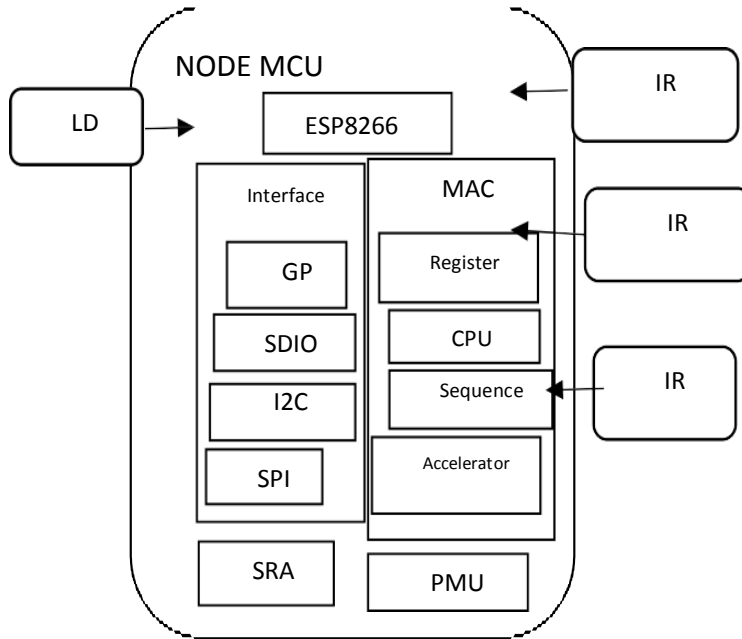
In this unit also, it includes motion or moving sensor, controller and communication device. Only if there is any moving objects nearby that light area it will broadcast the message to all other units. This particular sensor unit can be kept in various main places such as such as at electric poles, at house gates, at house fence and inside or outside of the door. By this technique we can verify that every street light turn on before pedestrians. The solar battery will be the better choice for power supply.

(c) Interconnecting:

MQTT protocol must be used to interconnect both the lamp unit and sensor unit. The major connectivity protocol in the field of IOT is MQTT and it is a machine to machine connectivity protocol. The main functionality behind this protocol is it can easily used in sending more messages to all other units. And also it is light weight model to be used effectively. It is broadly used in the remote areas where there is less number of connections which needs small network/bandwidth is used. Through the satellite link it will communicate with the broker who could be used in sensors. This communication takes place with the health care providers and that will be probably within the small range home automation and small devices.

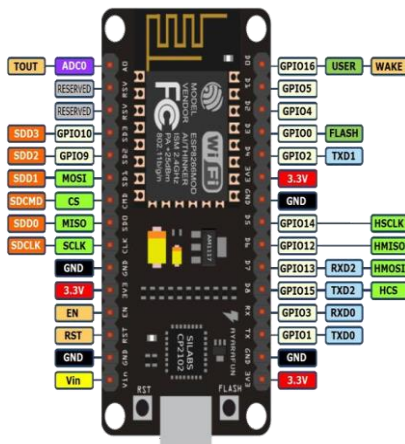
V. MODULES

BLOCK DIAGRAM



NODE MCU:

In this part acquired data is processed using Node MCU. The Wi-Fi modules esp8266 inbuilt in the Node MCU. Here we use C language for programming node MCU. Node MCU will make decisions based on data given in sensor.



IR Sensor:

The IR sensor is interfaced into Node MCU. The IR sensor is used for detected the objects.



LDR:

The LDR is used for measure the light intensity. The LDR is interfaced into microcontroller.



MQTT:

MQTT is a software or app that allows the user to message receiving from a smartphone. It is also used to control the hardware remotely. We have used MQTT as receiver in mobile phones. The MQTT server is responsible for the communication between the hardware unit and the smartphone.

NODE MCU:

- 1) The ESP8266 is the name of a micro controller designed by Espressif Systems.
- 2) The ESP8266 itself is a self-contained Wi-Fi networking solution offering as a bridge from existing micro controller to Wi-Fi and is also capable of running self-contained applications.

This module comes with a built in USB connector. With a micro USB cable, you can connect Node MCU to your laptop and flash it without any trouble, just like Arduino

VI. CONCLUSION

In this paper, we conclude that this smart street light is mainly achieved in case of reducing power consumption and also to reduce the manual operations. This paper mainly focus on making the light to dim or eve to bright with the help of sensors. The two sensors have been used motion sensor and light sensor. Motion sensor which is used to detect the objects and light sensors which is used to make the light to dim or brighter. Our future work may belongs to recording the motions nearby light and also intimating through message when there is any accident happens in that area.

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