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Available online at: www.jrrset.com
ISSN (Print) : 2347-6729
ISSN (Online) : 2348-3105
JIR IF : 2.54
SJIF IF : 4.334
Cosmos: 5.395
Volume 5, Issue 9 - September 2017 - Pages 48-54

Smart Street Lighting Using Iot

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Abstract: Street light are among the most common infrastructure in cities. Street lights and sensors can be combined to generate an interface of data collection. The analysis of massive data serves as an integral element of a smart city. This paper proposes a highly efficient system for the configuration, deployment, and management of smart street lights. System focuses on saving the energy by automatically switching ON and OFF of the street lights. When vehicles come to the street/road the sensor will capture the movements of the vehicles then light will automatically turned ON. If there are no movements of the vehicles on the road then lights will be automatically turned OFF.

Keywords: - Smart city, IoT,

1. Introduction

Internet Currently, over 50% of the world's population resides in cities. Billions of devices and systems are deployed in the urban infrastructure, from end-user equipment to urban infrastructure systems, such as smart street lighting, road management, pedestrian management, noise/air quality monitoring, waste management, and smart medical systems, forming a huge network ecosystem where all things are connected. Consequently, deluge amount of data is generated for the security of urban residents. A smart city employs new computing technologies and communication resources to integrate, manage, and analyze huge amount of data.

The internet of things (IoT) are able to implement transparently a very large amount of heterogeneous end systems, while digital service provides open access to sub set of data. The focus of this project is smart street light system. In this system the street light systems are automatically ON and OFF according to the situation. This smart light system automatically detects the movements of the object on the street. In the traditional system IR sensor is used to detect the object. The microcontroller is used to control the process involve the net. This project is focused on the controlling intensity of the light considering the object movement near the light. Two different sensors named light sensor and photo electric sensor are used. Once if the sun light goes under the visible region then this system automatically switches ON light. As soon

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as the sun light is visible then automatically switches OFF lights. This Smart light system is used to reduce energy consumption. In this smart system the system uses some of the sensors. This smart system is used to avoid unnecessary usage of electricity. The entire smart system is designed to operate using artificial energy source. The PIR sensor and LDR sensors are used to sense the human being and light intensity of a particular area and transmits the data in wireless to the EB section. This smart system is best suited for street lighting in remote urban and rural areas where the traffic is very low.

2. Literature Survey

[1] A Survey on Smart Street Using Solar and IOT based Light Management. The electric power is most useful of the countries in the world is utilized in lighting the streets. Currently, in the whole world, enormous electric energy is consumed by the street lights, which are automatically turn on when it becomes dark and automatically turn off when it becomes bright. The main goal of smart street light systems is that lights turn on when needed and light turn off when not required. The smart street light system contains of LED lights, brightness sensors, motion sensors, Arduino and short-distance communication networks.

[2] A Smart City Lighting Case Study on an Open Stack-Powered Infrastructure. The adoption of embedded systems, mobile devices and other smart devices keeps rising globally, and the scope of their involvement broadens, for instance, in smart city-like scenarios. In light of this, a pressing need emerges to tame such complexity and reuse as much tooling as possible without resorting to vertical ad hoc solutions, while at the same time taking into account valid options with regard to infrastructure management and other more advanced functionalities. Existing solutions mainly focus on core mechanisms and do not allow one to scale by leveraging infrastructure or adapt to a variety of scenarios, especially if actuators are involved in the loop.

[3] Automatic Street Light Control System. The system elaborates the design and construction of automatic light control system. The developed electronic system eliminates the disadvantages of the existing systems. Based on the results the microcontroller calculates and automatically detects geographical area and retrieve relevant data for sunrise and sunset in the area, respectively ensures very precise ON/OFF mode of the lighting system.

[4] Internet of Things Based Intelligent Street Lighting System for Smart City. This project is implemented with smart embedded system which controls the street lights based on detection of vehicles or any other obstacles on the street .Whenever the obstacle is detected on the street within the specified time the light will get automatically ON/OFF according to the obstacle detection and the same information can be accessed through internet. The real time information of the street light(ON/OFF Status) can be accessed from anytime, anywhere through internet.

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[5] Automatic Street lights on/off application using IoT .This project provides the simplest answer for wattage wastage. Conjointly the manual operation of the lighting system is totally eliminated. during this project the sensing elements square measure used that square measure lightweight Dependent resistance LDR sensor to point a day/night time and also the small controller is employed which is able to generate standing of sunshine to the user by exploitation GSM module that acts as a group action half between backside and also the side half.

3. System Design

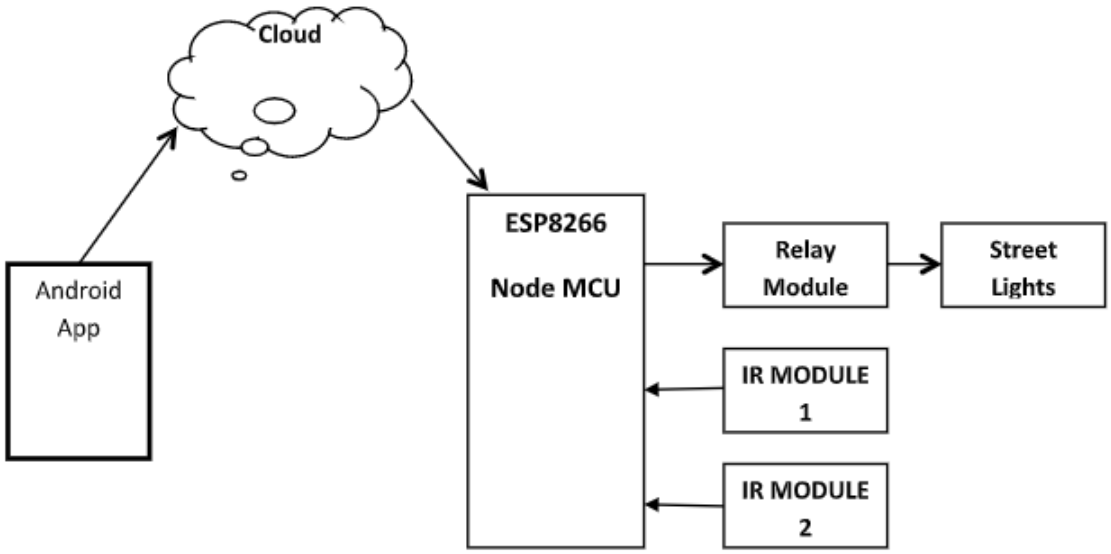

Fig 3.1: System block diagram

The Android App is connected to the cloud and the ESP8266 Node MCU is also connected to the cloud. The Status of the street lights are updated to the cloud by the ESP8266 Node MCU module, that status is read by the Android App and displayed in the Mobile. We can switch on/off the street lights with the help of the Android App also.

The IR Module1 and IR Module 2 are used for automatic switching of the street lights. Whenever any person or objects come near the street the street lights gets switched on. And when that person or object exits the street the street lights will switch off. The presence of

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the person or object is sensed by the IR Modules.

4. Implementation

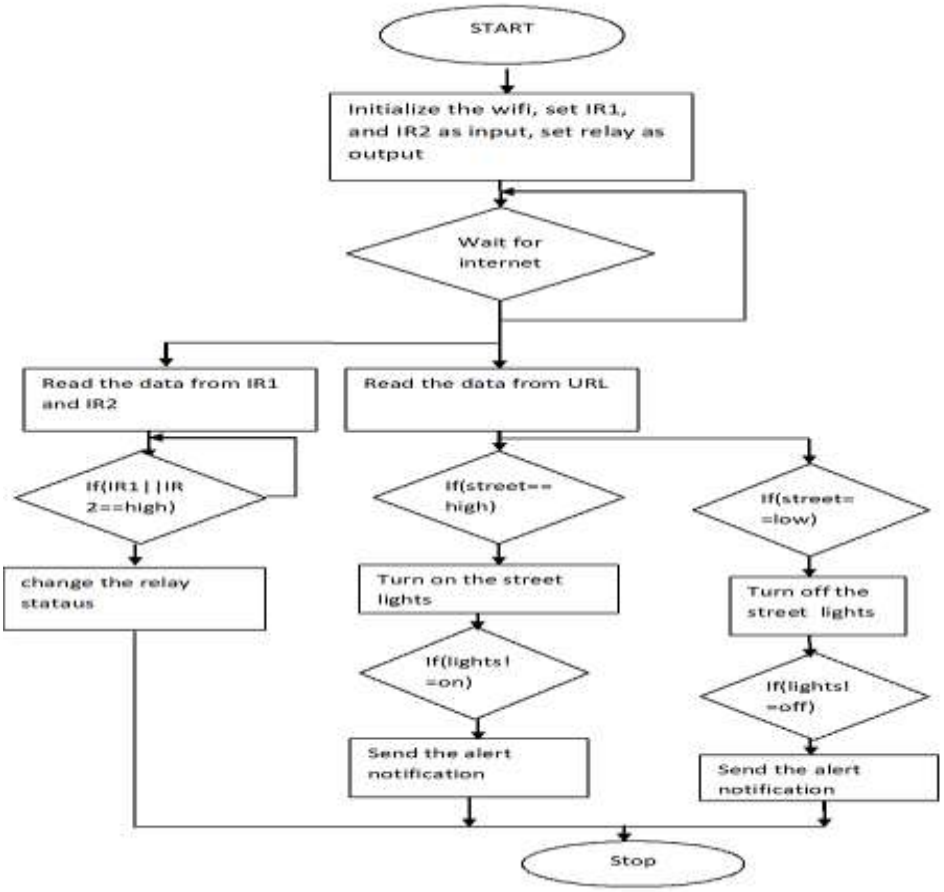

Fig 4.1: Software work flow

Here we declare ir1 and ir2 as input, relay as output. relay is connected to pin 5, ir1 is connected pin 4, ir2 is connected to 0. First system will initialize the Wi-Fi and waits for internet connection. To initialize the Wi-Fi we must store the SSID and Password of the

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multiple Wi-Fi. After successful connection of internet. System will establish the connection with server, our server name is alcodepro.com. When server connection is successful system will get acknowledgement
(200) with payload (information) in the form of response by this method we will read and write from and to the server through URL here we use "alcodepro.com/streetlight/ ", if any changes made in application that will changes the value in server after this, by reading this value controller will changes the status of the relay which will controls street light. By reading the ir1 and ir2 value, system will toggle the status of street light and also send data to the cloud through URL which uploads the data in server this data will reflects in application.

5. Results and Discussions

Fig 5.1: Working Model of Street lightning

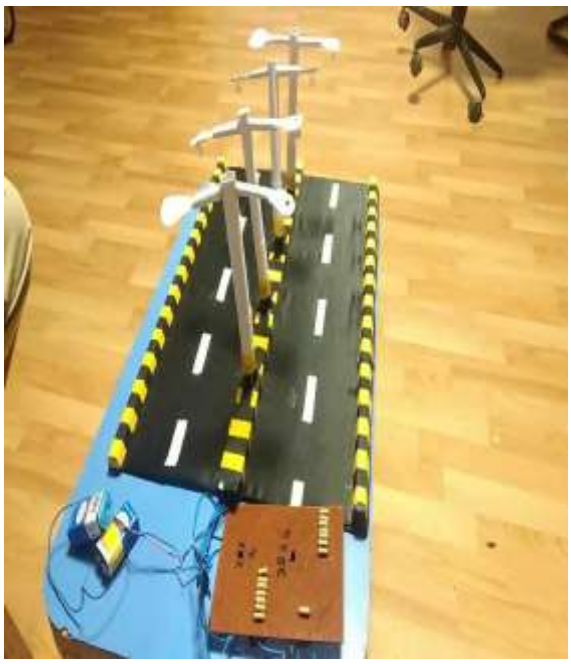

Fig 5.2: Hard Model of Street Lightning

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Fig 5.3: sign-in Page

Fig 5.4: Output of Street lightning

Sign In page is to provide user friendly interface. This page appears when code is executed. This page contains Sign In details. On successful Sign-In into page it will link to this page. This page contains two buttons street 1 and street 2 .These buttons gives notification about which street light is off.

5. Conclusion and Future Scope

The aim of this project is to save the electrical energy. We use IR and LDR sensors to detect vehicles on the road. This SSLS suits for Small Street to highway roads. This system can also be used in public places also like hotels, industries, etc. Manpower is not required in this system. This SSLS are mainly used in urban areas and highways to reduce the power wastage.

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