

Smart Street Light

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Abstract: Smart Street light is particularly made for the people who live in a developing country as it is very much important for economic and social stability.

We know that if we don't have Smart Street light we waste high electricity providing resources every year which is not good. So Smart Street Light comes with all of these it saves the electrical resources poor lighting conditions which creates unsafe conditions of the existing street light system. In this unlike other software's, we used Raspberry PI 3B module which is a base to our Smart Street Light system, which is a series of small single-board computers. It can be operated on Linux, Free BSD, Net BSD, Plan, RISC OS, Windows 10 IoT, Core.

Smart Street Light system also has sensors which are Light sensors and photoelectric sensors. Photo sensors are simply which sense light or electromagnetic radiations. The absorbed photons make electron-hole pairs in the depletion region. This sensor consists Spectral response, Quantum efficiency, Responsivity, Noise-equivalent power, Detective, Dark Current, Response Time, Nonlinearity. It also has HID which stands for High Intensity Discharge Lamp. They make more visible light per unit of electric power consumed than fluorescent and incandescent. Though HID technology is not new but is used widely.

Keywords: Smart street light

1. Introduction

In this the street lights are automatically switch on. It is cost effective and power consuming. The main goal of project is to provide automation to the street lights. It is difficult to operate the street lights manually. In this project we use the LED lams instead of their High Pressure Sodium Lamps (HPSL). The street lights HPSL consumes more power than LED, LED consume less power. This smart street light system is growing rapidly in the most of the cities and in the industry. this system reduces the use of energy in towns, cities, gardens using different technologies.

Infrared detector is a detector which reacts to the infrared radiations. The response time of the detector is much higher; it is having to be cooled to cut thermal noise. The intensity of the street lights is on the 50 %. When any object passes though the IR transmitter Receiver then the intensity of the street lights are increases to the 80 - 90 % Not 100 % increase. The intensity based on the Pulse Width Modulation (PWM). LDR captures the reading. When the sun set street lights switched on automatically and when the sun rise street lights switched off automatically.

2. Overview of the proposed system

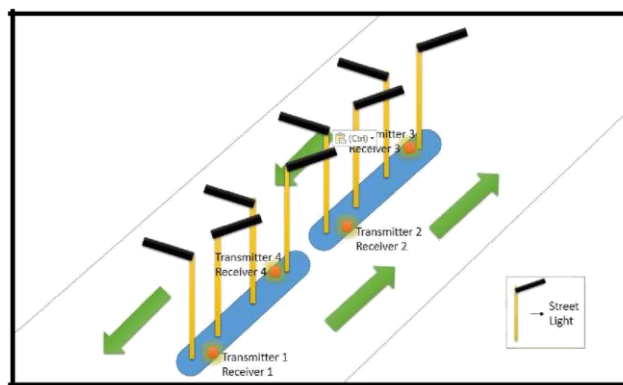


Fig. 1. Overview of the proposed system

It is an intelligent system which is designed such that it switches on and off automatically on the sunlight. We use LDR (Light Dependent Resistor) in this project. Second Feature of the project is there are an intensity controller. Dimming and Brightening has been carried out automatically when the objects passing through the IR resistors. It is implement using motion sensors using IR (Infrared) sensors. High Pressure Sodium lamps are work on the principle of gas discharge which are widely used for public lightning systems. The intensity of this lamps are not controlled by any voltage regulation. To overcome this problem, we us the LED lamps instead of the High Pressure Sodium Lamps. there are many advantages of the LEDs instead of the traditional lamps. LED are energy saving, it requires low maintenance cost, it has high colour rendering index, it has long working life, it has rapid start up. Our purposed system is alternative of the existing system where we can control the intensity of light it saves the energy and reduces the carbon emission and pollution.

3. Requirement analysis

Software and hardware are two interdependent components we can say that software without the support of hardware is of no use and vice versa. For running or execution of the developed system following specification of the hardware & software including operating system is required. System requirement is as follows,

Hardware Requirement:

- IR transmitter and receiver
- LDR
- LED

- Transformer
- Decoder
- Raspberry pi 3B module
- Keyboard
- Screen with HDMI port
- Encoder

Software Requirement:

- Python language
- GUI

Advantages:

- The street lights switching on / off Automatically.
- The cost is reduced because of using LED instead of the Sodium vapour lamps.
- Man power is entirely eliminated.
- It reduces the emission of CO₂
- The light pollution is reduced.

Applications:

- Garden Lights.
- Township Management.
- Museums.
- This is used in real time and highways also.

- This can be used for the parking areas in the hotels, restaurants, companies.

Future scope:

- This software of our can further be developed using developed technology such as ordinary LED based modules by the Solar Modules and can be replaced respectively.
- The world today is opened to various latest technologies with some advance sensors we can use this same advanced technology to reduce human effort and high costs.
- The main intention behind this project is to save natural and human energy be it in any form.

4. Conclusion

- Project is cost effective, practical and it saves energy.
- It disposal of incandescent lamps, very efficiently.
- We can save 40% of electrical energy that consumed by highways.

References

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