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IOT BASED SMART LED STREET LIGHT SYSTEM

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Abstract: IOT based street light system is automated aiming to design and implement advanced developments in IoT for energy saving of street lights, the best solution to power wastage is automation of street lights, completely eliminating manual operation of lighting systems has gone. A method of modulating street light illumination by using sensors at minimum electrical energy consumption, when the presence of object is sensed, the street lights glow in brightest mode, otherwise they remain in dim mode during the night The Internet of Things is used for visualize road processing and there are real-time updates to inform changes. This will reduce heat emissions, electricity consumption, maintenance and replacement costs and carbon dioxide emissions.

Keywords: Arduino node mcu (ESP8266), IR Sensor, LDR sensor, bylnk application I.

Introduction

Street light is an essential part of any emergent area. They are current all main road-ways and in suburbs too. Daily, streetlights are powered from the sunset to sunrise at full of strength, even when there is nobody around. On global scale, lots of dollars are spent every day on these streets light to provide required electrical energy. This paper bounces the best solution for electrical power wastage. Also manual operation of lighting scheme is completely removed. The energy ingesting in entire world is increasing at fastest amounts due to population growing and economic development and accessibility of energy sources leftovers woefully forced. We use word smart since system not provide only power to streets light but helps in noticing direction of movement of dull and help him by mean of revealing path of movement till near next highway lights. Simple and actual solution to this would be the dimming lights during off peak hours When ever occurrence is detected; lights around it will glow at bright mode. This would save lot of energy's and also reduce cost of process of streetlights. We check status of streets light on internet using IoT from anywhere in real time and solve issue if happened during processing. This paper proposes on intelligent wireless street light controls, which integrate new technologies, offering ease of maintenances and energy saving. Using solar panel in lamp post By using LDR it's likely to save more control and energy, and we can also observed and controlled streets light using GUI application, which show status of light in streets or highways lighting systems

This paper suggested an intelligent management of lamp posts by sending data to a central station by ZigBee wireless message. With suggested system, maintenance can be easily and professionally planned from central station, allowing extra savings. These streets light control system help in energy's saving, discovery of faulty light and upkeep time and upsurge in life extent of the system.

II. EXISTING SYSTEM:

In existing system, streets light are off and on switched physically by public itself, this involve a difficulty in way that at many times public forget switch it OFF, Which is overcome in our projected system.

III. PROPOSED SYSTEM:

In an our planned system, we make use of property of LDR, which is its resistance varies with respective to the light intensity, In an our proposed system the night and days are recognized using LDR, during day time streets light will swapped off and then during night time street light will switched on mechanically, IR sensors are used to notice presence vehicle on Road, If the crowd of the vehicle is low on street then it will be sensed IR sensor and light will switched off, If the vehicle is present in the street then light will turned on

IV. ARCHITECTURE:

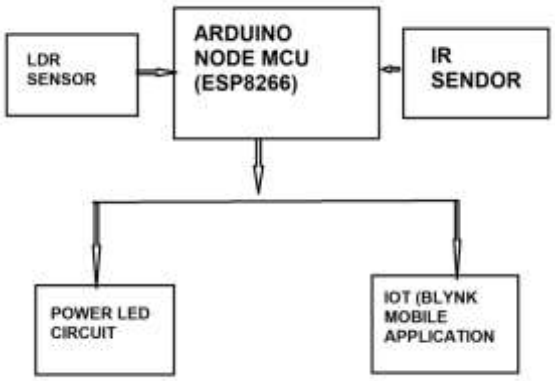


Fig 1.1 system architecture for IOT based smart streets lighting system.

IR SENSORS:

Infrared sensors are electronic instruments that are used to sense to certain characteristic of its surrounding by whichever releasing and/or detecting ultraviolet energy. It is also accomplished of measuring heat of object sensing motion. Infrared wave are nothing visible to humans eye. In electromagnetic range, infrared radiations are region having wavelength extensive than noticeable light wavelength, but shorter than microwaves. Infrared regions are about demarcated from the 0.75 to 1000μm.

LIGHT DEPENDENT RESISTOR (LDR):

Photo resistors are device whose resistivities are function of occurrence electromagnetic energy. Hence, they are lights subtle devices. They are also named like photo conductor, photo conductive cell. They are modes of semiconductor resources taking high confrontation. There is many dissimilar symbol used to indicate LDR, most usually used symbols are shows in figure below.

POWER LIGHT EMITTING DIODE (LED):

A high-power LED light source is a single LED power higher than 0.5W. At presents, many manufacturers' uses a low influence LED, but it need used a lot of LED, and lower power LED with advanced light decay. It is trend to uses the power LED source profitable lighting. Powers LED is lights emit diodes with high rated present. Low LED power are usually 0.1W, working present are 20mA but control LED can be reach 1W, 2W, of watts, working present can range of ten of mA numerous hundred mA.

RESISTORS

Resistors are an electrical module that limits flow of electrically current in electronic circuit. Also resistor can used to provides precise power for active expedient such as transistor. All additional factor being equal, in DC circuit, current finished resistors are inversely comparative to its resistance, and straight relative to voltage crossways it.

CAPACITORS

Capacitors are inert components used to stores a charge. Charge (q) stored capacitor is product its capacitance value and voltage useful Capacitors proposal unlimited reactance zero incidences. They are used for blocking avoiding AC signals. Capacitor undergoes done recursive series of the charging and squaring AC circuit where voltage and present across it be contingent on RC time continuous.

ARDUINO MODE MCU(ESP8266):

Nodes MCU are open source IoT's podium. It does include firmware which run on ESP8266Wi-FiSoC from expressive Systems, hardware which are based on ESP-12 module. In term "NodeMCU" by evasion refers to firmware somewhat than dev kit. Firmware uses Lua scripting language. It is built on the eLua scheme, and built on Espressos Non-OS-SDK for ESP8266.

INTERNET OF THINGS (IOT):

IOT is developing topic of social, technical, economics significance. Consumer product, durable goods, car and truck and usefulness component, sensors, and other ordinary object is being joint with Internet connectivity data analytic skills that promise to convert way we live, play and work,.

BLYNK MOBLIE APPLICATION:

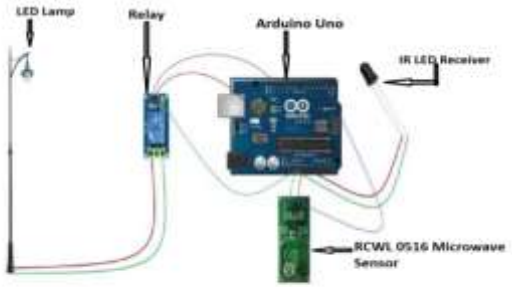
Blynks are Platform with Android and iOS app control Arduino Mode MCU(ESP8266) Mode MCU(ESP8266), It's digital console where you can shape graphic interface your scheme by simply slow and dropping widget.

V. IMPLEMENTATION:

HARDWARE IMPLEMENTATION:

All the components are to be connected with Arduino board. In this input module of the project, we used 2 IR sensors which are interfaced with Arduino Mode MCU(ESP8266) and work individually respective to each other. In this we are connecting the output pins IR sensor to pins D0, D1 of Arduino Mode MCU (ESP8266) to give status IR sensor.IR sensor senses presence of vehicle on road and increases intensity of LED streets lamp on road through output module. All IR sensor works on 5V and Arduino MCU (ESP8266) is working on less than 4V supply. Two virtual switche is connected arduino mcu though blynk applications.

Implementation:



Implementation of IOT created led street lighting system.

VI. RESULTS:

The project goal was to reduce result of current lighting system and finds solutions to save the power. In this project the first thing to do prepare I/O of the system to control lights. The project shown figure implemented and works as expected and will prove to be very useful. When switch 2 is turned on LED 5- LED8 glow in brightest mode when obstacles are detected in both IR sensors LED radiance in brightest mode.

When switch 2 is tune on LED 5- LED8 glow in happiest mode.

When difficulties are notice in together IR sensor and LED glow in sunniest mode.

VII. CONCLUSION:

The use of power electronics is growing exponentially across many sector of the human life. Component used in projects, like Arduino sensors and MCU is slowly flattering a necessary part of daily routine. So, it is only suitable that we use them to improve competence in every walk of the life. Keeping in mind crucial need for energy preservation, IoT based Smarts Street light systems are superb and actual solution. It is combines benign lighting protocol with depletion of minimal quantity of power. Energy savings, as discussed before is phenomenal. The future scope of project expands into speed detection and customizable area of illumination. Additional modules which lead to better operative of concept would be use of LED bulb. In spite their high initial cost, they are viable choice as they drastically reduce power consumption. They will aid in further saving of energy and reduction in operational costs.

REFERENCES:

[1] Subhas Chandra Mukhopadhyay, Fellow, "Wearable Sensors for Human Activity Monitoring: A Review" IEEE Sensors journal, vol. 15, no. 3, march 2015 1321.

[2] Matthew Kane, Amy kesluk, Edward Teawetal., "A Wireless Health Monitoring System," in Proc .IEEE, 2005.

[3] Takuji Suzuki, Hirokazu Tanaka, Shigenobu Minami etal., "Wearable Wireless Vital Monitoring Technology for Smart Health Care." 7th International Symposium on Medical Information and Communication Technology (2013).

[4] [Online]. Available: http://www.stjohn.org.nz/Medical-Alarms/ Medical-Alarm-Devices, accessed Sep. 14, 2014. [5] J. Edwards, "Wireless sensors relay medical insight to patients and caregivers [special reports]," IEEE Signal Process. Mag., vol. 29, no. 3, pp. 8–12, May 2012.

[6] K. Malhi, S. C. Mukhopadhyay, J. Schnepper, M. Haefke, and H. Ewald, "A Zigbee-based wearable physiological parameters monitoring system," IEEE Sensors J., vol. 12, no. 3, pp. 423–430, Mar. 2012.

[7] P. A. Shaltis, A. T. Reisner, and H. H. Asada, "Cuffless blood pressure monitoring using hydrostatic pressure changes," IEEETrans. Biomed. Eng., vol. 55, no. 6, pp. 1775–1777, Jun. 2008.

[8] M.-Z. Poh, K. Kim, A. Goessling, N. Swenson, and R. Picard, "Cardiovascular monitoring using earphones and a mobile device," IEEE Pervasive Comput., vol. 11, no. 4, pp. 18–26, Oct./Dec. 2012.