Smart Street Light Management System

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Abstract:
The main idea of this smart street light management system is to reduce the power consumption as well as wastage of electricity. Street lights play a main role in night life and exposure to public area yet it takes large proportion of power. The power consumption is more at night times though no people roam around the roads, by using IOT, LDR sensors and the ARDUINO board we developed an advanced way of managing street lights. Here the power consumption can be reduced by giving the time delay connecting the IR sensors with ARDUINO board which can hold for 5 poles containing the sensors. The LED lights can reduce the electricity wastage and can withstand at various conditions and they can be used for a long time. The IR-sensors which detect the motion of the particle gives the information to on the lights. Instead of using LDR we can directly give the code to the controller. It ensures high reliability and good long term stability.

Keywords: INTERNET OF THINGS (IOT), LIGHT EMITTING DIODE (LED), ARDUINO UNO, IR-SENSOR;

I. INTRODUCTION

IOT is the interaction of physical devices that allows interaction of the various devices .It allows good remote sensing and good control over various types of devices. it is an analytical system which may use artificial intelligence for the production of various advanced products .This system provides good control and greater performance .IOT has several automations like smart home ,parking etc. The current lighting system involves in various issues like connectivity and maintenance .These issues can be solved by the use of IOT technology .By the use of this technology an adaptive lighting system can be improved .Automated system simplifies various problems in our daily life. it uses various latest tech like led(LIGHT EMITTING DIODE) bulbs instead of HDI or some sodium lamps .These led bulbs are due to its various advantages like very low power consumption , maintenance cost is also low .Now a days the demand for automated products is highly increasing. Manual operation includes high power wastage and lower performance. The IOT can be viewed as a global infrastructure for the information society, enabling advanced services by interconnecting physical and virtual things based on existing interposable information and communicating technologies. Simply it is a network of physical objects accessed through the internet, as defined by technology analysts and visionaries. The main aim of the paper is to make the streetlights automated and to increase its productivity. This also makes energy conservation.

II.RELATED WORKS

2.1 ENERGY EFFICIENT SMART STREET LIGHT

Automatic intelligent elimination control of light during the light by detection the motion of vehicles and pedestrians. And the energy saving in street lights can be achieved by adopting an intelligent automation technique. In this system the device is connected to another device in desired manner so that it helps in understanding pole connections in an easy, simple and flexible way. The hardware used is ESP8266 NODEMCU is one of the low cost Wi-Fi module. A 32-bit Tensilica Xtensa

l106 micro controller is integrated in to it, LDR is based on photo conductivity, as an optical phenomenon that if light falls on material its conductivity raises, ultrasonic sensors are used to measure the distance how the object is and get backs an echo from the object. Arduino IDE is a software used to write programs that can be uploaded directly in to the board. It is an open source platform & very easy to use hardware and software & can be used in many operating systems.

2.2 STREET LIGHT INTENSITY OPERATOR

This system proposes using a LDR & IR proximity sensor RTC LCD modules & microcontroller. The micro controller is heart of the system. Its operating voltage is 5volts, DC current I/O pin: 40 nA. The RTC known as DS1307 module is used to incorporate for the real time clock. Its time is fairly accurate with a time drift 1-minue per month. IR proximity sensor is used to detect an object.

2.3 AUTOMETIC STREET LIGHT SYSTEM

This system includes LDR photo electric sensor, relays, regulated power supply, PIC16F877A microcontroller. The photo electric sensor is to detect the movement in the street where emitter and receiver are the main part of the sensor. Relays are the remote control electrical switches which are controlled by additional switch. These allow a small current flow to control a high current circuit. We have 3-pin, 4=pin, 5=pin,6-pin and single switch. These come under various types, sizes, ratings & applications. The microcontrollers are now changing electronic designs. This project focuses on PIC16F877A microcontroller perform some function which we use now in this system. 4-photo electric sensors are used to function to sense the object that pass through the street. Where the system has been designed to light the lamp in the night only if the object passes through street.

III. EXISTING METHODOLOGY

This system contains LDR, DHT11 sensor and some electronic components this system can hold eight lights and managed

through the ESP-12 Wi-Fi module. IN this the system works by collecting data from the sensors and send to the data base here they use hid lamps and the entire project can be worked through the microcontroller. Here the LDR collects the data and sends to the Arduino board and the dht11 sensor also sends the information to the board and the esp-12 Wi-Fi module takes the access to control the powering of the lights from that relay is given to the individual sensors to ON and OFF the light. The dht-11 sensor also gets the data of the climate and temperature so that the LDR can be also controlled by this to not ON the lights in a low light.

IV. PROPOSED METHODOLOGY

Specialized feature in this smart design is the intensity control of the street lights, where dimming and brightening of LEDs has been carried out automatically based on the detection of detection of any moving object. This feature is implemented with the use of motion sensor such as PIR (Passive Infrared Sensor). Normally high pressure sodium lamps are used for public lighting system which are based on the principle of gas discharge. Therefore the intensity of theses lamps are not controlled by any voltage regulation. However our proposed system utilizes the LED technology. We also propose the time management so that if won't work we use of LDR. By using the aurdino and regulated power supply there won't be any damage to the micro controller. By using the PIR Sensor, it detects the motion and data is given to the micro controller, so it turns the light ON.

V. MODULE DESCRIPTION

The modules of this project accompanies Arduino board, relays, IR-proximity sensors,

ARDUINO:

Arduino uno is a microcontroller based on the ATmega328. It consists of 14 input output pins, where 6 can be used as PWM outputs and six analog can be used as inputs. It also consists of 16 mhz ceramic resonator, a USB connection, power jack, an ICSP header and a reset button to reset the data.
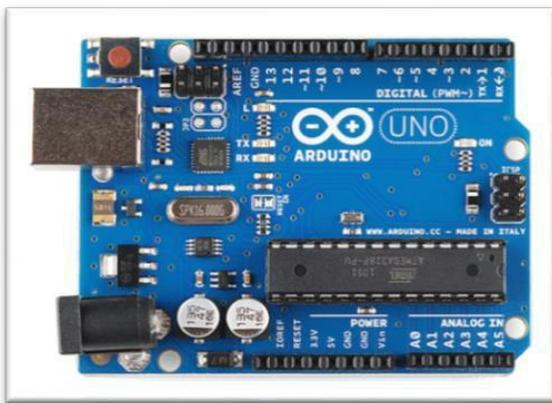

Figure.1. Arduino board

LDR:

LDRs or Light Dependent Resistors are very useful especially in light/dark sensor circuits. Normally the resistance of an LDR is very high, sometimes as high as 1000 000 ohms, but when they are illuminated with light resistance drops dramatically. However, when light shines onto the LDR its resistance falls and current flows into the base of the first

transistor and then the second transistor. The LED lights. When the light level is low the resistance of the LDR is high. This prevents current from flowing to the base of the transistors. Consequently the LED does not light. Here we use transistor as a two way switch. If the voltage through base is greater than 5V it send through the emitter. If the voltage through base is less than 5V the it sends through collector. During night the LDR gives a high resistance as a result the voltage passing through the base will become less than 5V so the led glows During day time LDR gives a low resistance as a result the voltage through base is greater than 5V which switches the current to the emitter. This turns LED off.
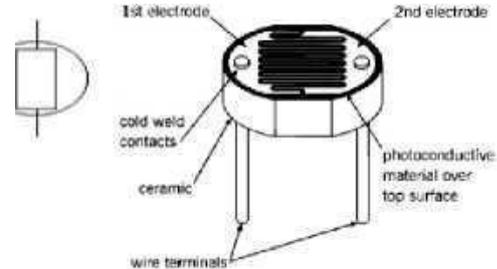

Figure.2. Ldr

IR-PROXIMITY SENSOR:
An IR-proximity sensor is a sensor which detects an obstacle without any physical contact. It emits an electro magnetic fields or a beam of its radiation, and looks for a change of field or signal. The object which is being sensed is know as target. Different targets requires different types of sensor. It has high reliability and long functional life because of its lack of physical contact between the object and sensor. When it is adjusted to very short range it is used as touch switch.

Figure.3. IR-Proximity sensor

REGULATED POWER SUPPLY:
We start with unregulated power supply which is of range from 9-volts to 12-volts DC. KA8705 voltage regulator as shown in figure has been used. In the kA8705 voltage regulator from unregulated dc power supply.
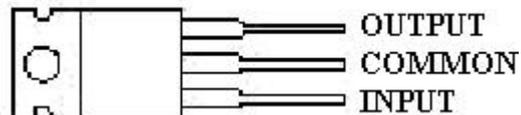

Figure.4. Regulated power supply

MICROCONTROLLER:
A microcontroller is a single chip microcomputer made through VLSI fabrication. A microcontroller also called an embedded controller because the microcontroller and its support circuits are often built into, or embedded in, the devices they control. A microcontroller is available in different word lengths like microprocessors (4bit,8bit,16bit,32bit,64bit and 128-bit microcontrollers are available today).

Figure.5.Microcontroller

VI. CONCLUSION:

This paper elaborates the design of automatic street light system control circuit. By giving commands to the controller, the lights will be turned ON in the places of the movement when it's dark. An enormous amount of energy can be saves by replacing sodium vapour lamps by LED. It prevents unnecessary wastage of electricity. This system can reduce the energy consumption and maintenance cost. It can be used in urban as well as rural areas. This system is extendable and to the needs of the user. It creates a safe environment with maximum intensity light whenever required.

VII. .REFERENCES

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