International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 04 Issue14
November 2017

A Solar Powered Street Light Led Technology Using Iot

Navya.CH & Reshma Begum.Sheik
PG Scholar, Dept of ES, Assistant Professor, Dept of ECE
skreshmabegum456@gmail.com , navyach140@gmail.com
St. Martins Engineering College, Jawaharlal Nehru Technological University,
Hyderabad, Telangana, India.

Abstract:

Electrically powered street lighting has brought a sense of wellbeing and freedom from risk or danger but Street lights in town centers, traffic lights and pedestrian crossings stay on all night. This amount of lighting is not required in that it adds no benefit to the community. Continuous ON state of street light leds to power wastage. In other case, it is getting very difficult to analyze the failure of street lights in all places. In these kinds of situation effects of crime will be increasing. In our proposed project work we have analyzed these problems.

This Project work consists of a group of measuring stations in the street (one station located in each lamppost) and a base station located nearby. The measuring stations are used to observe street conditions as the intensity of daylight and, depending on the conditions they activate or off the lamps. For these reasons every lamp is designed independent to decide about the activation of light. The base station conjointly checks if any lamp is correctly operating and sends the information using the wireless network to the operator who will act in case of malfunction.

KEYWORS: ARDUINO, PIR, IR,LED ARRAY,SOLAR PANEL.

I. INTRODUCTION

The most important aim of the project is to Save Energy by Using "SOLAR POWERED STREET LIGHT LED TECHNOLOGY USING IOT". The primary competence of the streetlight is to light up the road at dull hours. here we utilize sun powered boards to get the power and spare vita. The Led can without much of a stretch supplant conventional road light and They are exceptionally adaptable towards new innovation in which road light controls its power as per the shine of the ambiance and it is consequently exchanged ON when the daylight venture down and is obviously turned OFF when there is satisfactory daylight by using LDR. This framework expels manual work of turning ON and OFF of road light .the IR sensors is used to detect the vehicle and PIR sensor is used todetect the persons bybody radiations

The IR sensor, PIR and LDR sensor sense the people and light power of a detailed place and transmits the information to micro controller and that information remote through web. Rely on the information got the controller will kill ON/the road light in remote control.

Existing System:

Fundamentally, road lighting is one of the imperative parts. In this way, the road lights are generally straightforward yet with the improvement of urbanization, the measure of lanes increments quickly with high activity thickness. Toward the starting, road lights were controlled by manual control where a control switch is set in each of the road lights which is known as the original of the first road light. From that point forward, another strategy that has been utilized was optical control technique done utilizing different sorts of road lights as per the light utilized.

The technique works by set up an optical control circuit, change the protection by utilizing of light touchy gadget to control road lights light and we have manual framework where the light will be exchanged ON in the night prior to the nightfall and they are turned OFF following day morning after there is adequate light outside. So there is parcel of vitality squander amongst ON and OFF planning. Because of the innovative improvement these days, street lighting can be arranged by the establishment zone and execution, for a case, lighting for movement courses, lighting for backup streets and lighting for urban focus and open luxury regions

Drawbacks of this System:

- Manually switching ON/OFF
- Not fully Energy Efficient systems
- More Energy Consumption

Proposed system:

The Automation, Power utilization and Cost Effectiveness are the imperative contemplations in the present field of gadgets and electrical related advancements. To manage and keep up complex road lighting framework all the more monetarily, different road light control frameworks are created. These frameworks was created to control and diminish vitality utilization of a town's open lighting framework. also, circuit that switches the road light ON/OFF identifying the vehicle development utilizing IR and PIR Sensors in auto mode and solar control in which photovoltaic cells are utilized for charging batteries by changing over the daylight into power.In this framework the road light naturally ON amid the night and consequently OFF in the day time by utilizing LDR we can screen the road light switch On/OFF conditions by IOT . Here we need to give IP deliver to road lights (IOT) with the goal that the base server can control the entire city's road lights utilizing web.

Along these lines, the examination work features the vitality effective arrangement of the road lights framework utilizing LED lights with IR, PIR sensor interface for controlling and overseeing. The WSN helps in enhancing the system detecting for road lighting

Hardware Requirements:

- Arduino
- IR Sensor
- PIR Sensor
- Solar Panel
- Led Technology

Software Requirements

- Arduino Software IDE
- Arduino programming language (Embedded- C)

International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 04 Issue14
November 2017

Block Diagrams:

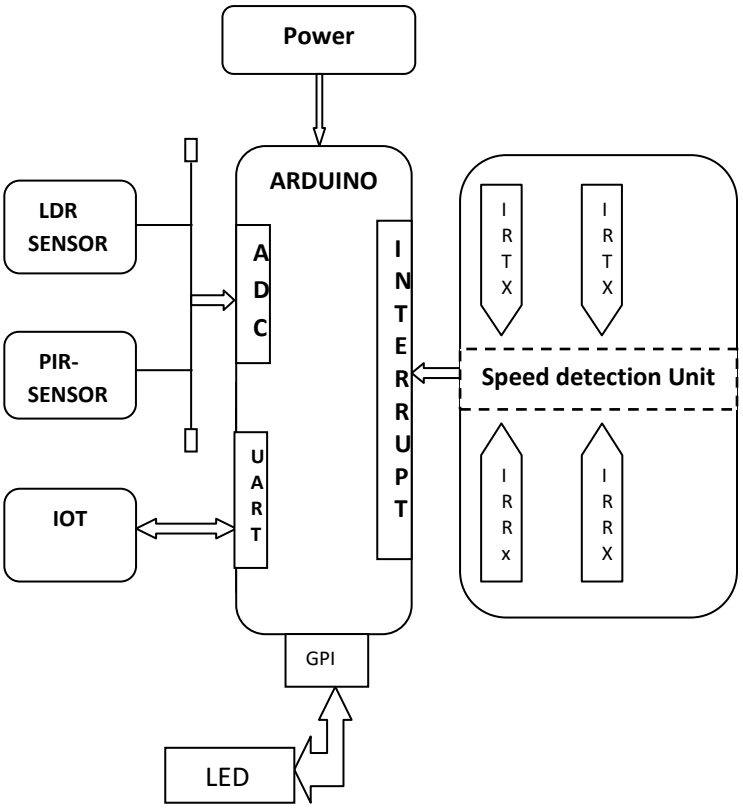


Fig1:StreetLightSection

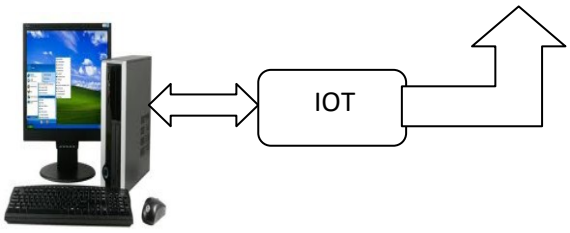
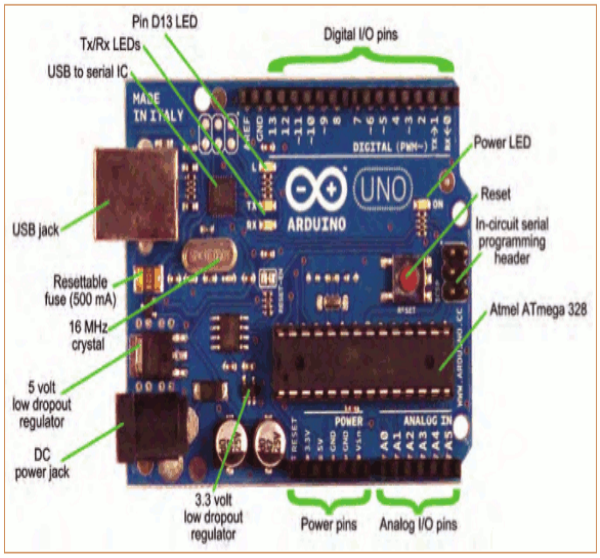


Fig2: Monitor Section

III.SYSTEM HARDWARE:



1.Ardunio Atmega328P:

The Arduino ATmega328P microcontroller based on the AVR,enhanced RISC architecture. Byexecuting powerful instructions in a single clock cycle, the ATmega328/Pachieves throughputs close to 1MIPS per MHz. This empowers system designer to optimize the device for power consumption versus processing speed.

Features:

High Performance, Advanced RISC Architecture,131 Powerful Instructions, Most Single Clock Cycle Execution,32 x 8 General Purpose Working Registers, Fully Static Operation Up to 20 MIPS Throughput at 20MHz,On-chip 2-cycle Multiplier, High Endurance Non-volatile Memory Segments,32KBytes of In-System Self-Programmable Flash program Memory,1KBytes EEPROM,2KBytes Internal SRAM, Write/Erase Cycles: 10,000 Flash/100,000 EEPROM, Data Retention: 20 years at 85°C/100 years at 25°C(1),

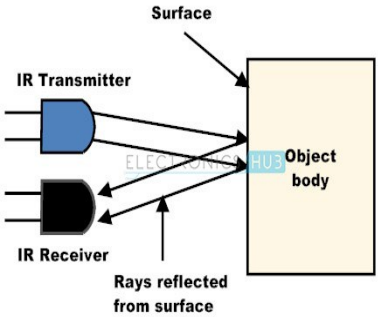
International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 04 Issue14
November 2017

Optional Boot Code Section with Independent Lock Bits, In-System Programming by On-chip Boot Program, True Read- While -Write Operation, Programming Lock for Software Security

1.2 IR Sensor:

IR transmitter and receiver can be obtained at low price. Their shape is looks exactly the same as LED. To distinguish between transmitter and receiver, the transmitter always come in clear LED while receiver is black in colour. Other than that, there is alsoreceiver that is used to pick up specific frequency IR, 38kHz. For your information,

38kHz frequency IR is commonly used in remote control. IR transmitter will emit infra-red when powered. You can connect the IR transmitter like a LED together with a current limiting resistor. The current limiting resistor is used to prevent too much of current passing through the transmitter and burnt it. I am using 330 ohms resistor for the IR transmitter.



1.3 LDR SENSOR:

A light dependent resistor works on the principle of photo conductivity. Photo conductivity is an optical phenomenon in which the materials conductivity (Hence resistivity) reduces when light is absorbed by the material.

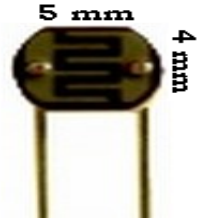


Fig: LDR Sensor

when the photons fall on the device, the electrons in the valence band of the semiconductor material are excited to the conduction band. These photons in the incident light should have energy greater than the band gap of the semiconductor material to make the electrons jump from the valence band to the conduction band. Hence when light having enough energy is incident on the device more & more electrons are excited to the conduction band which results in large number of charge carriers. The result of this process is more and more current starts flowing and hence it is said that the resistance of the device has decreased. This is the most common working principle of LDR.

1.4 PIR SENSOR:

Passive Infrareds sensors (IRs) are electronic devices which are used in some security alarm systems to detect motion of an infrared emitting source, usually a human body.The pyroelectric sensor is made of a crystalline material that generates a surface electric charge when exposed to heat in the form of infrared radiation. When the amount of radiation striking the crystal changes, the amount of charge also changes and can then be measured with a sensitive FET device built into the sensor. This radiation (energy) is invisible to the human eye but can be detected by electronic devices designed for such a purpose

1.5 SOLAR PANEL:

International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 04 Issue14
November 2017

Sunlight based boards get vitality from the sun for individuals to utilize. There are two sorts of solar based boards, those that gather (warm), and those that create power (photovoltaic). Warmth from sun oriented boards is regularly utilized for space warming and for high temp water.

A sun based cell / photovoltaic cell (PV), is a widget that proselytes light into electric Power utilizing the photovoltaic brunt. A photovoltaic cell (already named "sun oriented battery", is an electrical gadget that changes over the vitality of light straightforwardly into power by the photovoltaic impact, which is a corporeal and compound phenomenon.It is a type of photoelectric cell, characterized as a widget whose electrical qualities, for example, current, voltage, or protection, differ when presented to light. Sunlight based cells are the building squares of photovoltaic modules, also called sun powered boards

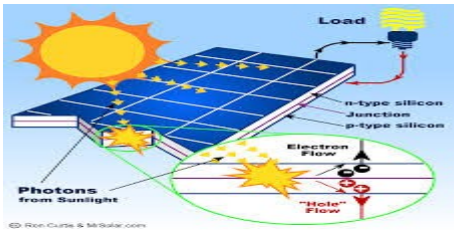


Fig: Solar Panel

IV.SOFTWARE PROGRAMMING

1.Arduino Software IDE:

The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a content manager for composing code, a significance zone, a content support, a toolbar with catches for normal capacities and a progression of menus. It boundaries with the Arduino and Genuino apparatus to transfer programs and converse with them..

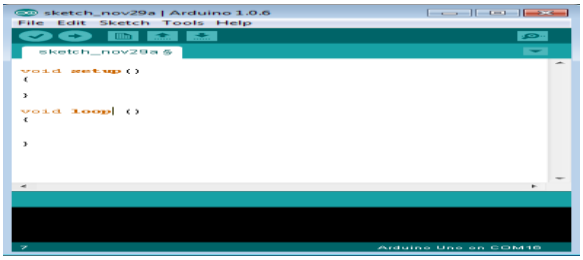


Fig: Arduino Software Sketch

1.2 Arduino Programming Language

Embedded 'C':

Embedded systems programming is different from developing applications on a desktop computers.

Embedded systems are programmed using different type of languages

- Machine Code
- Low level language, i.e., assembly
- High level language like C, C++, Java, Ada, etc.
- Application level language like Visual Basic, scripts etc

The Accumulation Procedure:

The Arduino code will be truly out and out of age c without each and everybody of header a noteworthy angle (the joins Furthermore all). At you press the 'incorporate' catch, the IDE recuperations those present report similarly as arduino. C's in the 'lib/construct' registry a while later it calls A make file held in the 'lib' registry.

This make file copies Arduino. C Likewise prog. C under 'lib/tmp' including 'wiringlite. Inc' similarly as those begin from asserting it. This operation makes those arduino/wiring code under A most ideal c record (called prog. C).

International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 04 Issue14
November 2017

Following this, it copies each and every one of records in the 'center' registry under 'lib/tmp'. These records are those execution of the Different arduino/wiring orders including will these documents incorporates summons of the tongue. Those inside documents are supported by pasangstang'sprocyonavr-lib that is held in the 'lib/avrlib' registry. At this point of view the code held over lib/tmp might be set up to an opportunity to be collected for those c compiler held secured nearby 'apparatuses'. In the make operation is succesfull then you'll have prog. Cut arranged should make downloaded under those processor.

V.RESULTS & DISCUSSIONS

The Project "SOLAR POWERED STREET LIGHT LED TECHNOLOGY USING IOT" has been successfully designed and tested.

HARDWARE KIT SNAPSHOT WITH RESULT:

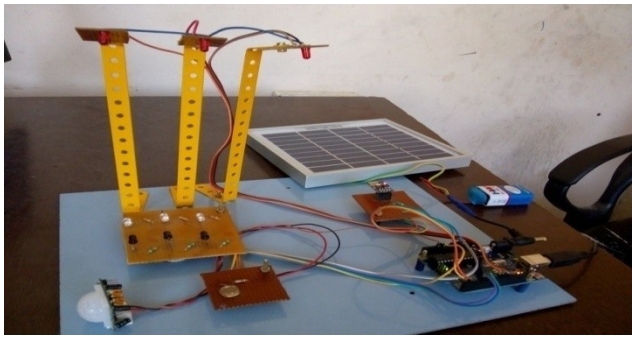


Fig: Snapshot of Hardware kit

CASE 1:

It is Night time, So All the LED's are Turns ON Automatically with low brightness.

Fig: Snapshot of all LED's on state

CASE 2:

The object/vehicle is detected by IR sensor at the Streetlight 1,So the corresponding LED1 Turns on Automatically with more intensity compare to other streetlights.

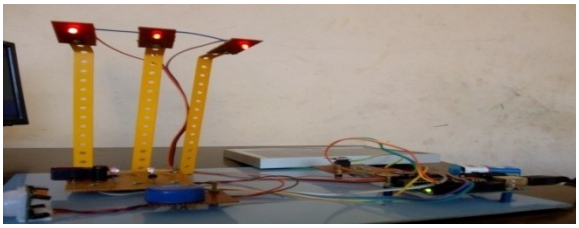
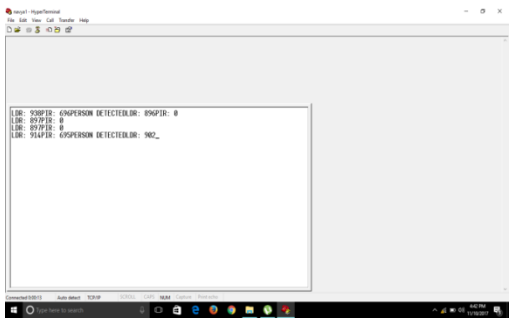


Fig: Snapshot of LED1 with high lighting

CASE 3:

The Person is detected by PIR Sensor , So All the LED's are Turns ON Automatically with More intensity.



International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 04 Issue14
November 2017

Fig: Snapshot of Detection of PIR Sensor

OUTPUT LEVELS:

OUTPUT ON WEBPAGE:

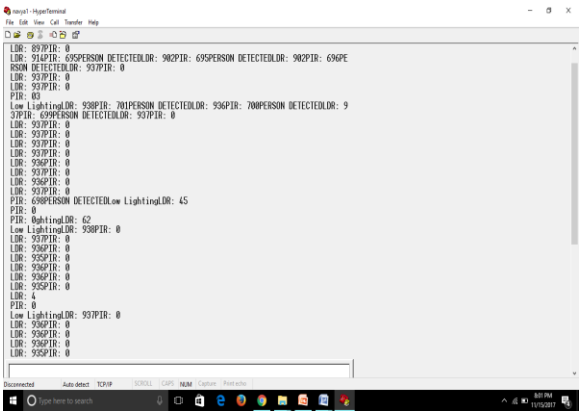


Fig: Snapshot of Result on webpage

VI. CONCLUSION & FUTURE SCOPE

Conclusion:

This paper expounds the outline and development of programmed road control framework circuit. Circuit works legitimately to turn road light ON/OFF. In the wake of outlining the circuit which controls the light of the road as showed in the past areas. LDR/PIR sensor and photoelectric sensors are the three principle circumstances in working the circuit. On the off prospect that the three conditions have been pleased the circuit will do the coveted work as indicated by particular program. Every sensor controls the killing ON or the lighting segment. The road lights have been healthy controlled by microcontroller. If we have any issue in road light that will send sms to specific confirm individual through IoT. With charges from the controller the lights will be ON in the spots of the development when it's dull. Besides the downside of the highway light framework utilizing clock controller has conquered, where the framework relies upon photoelectric sensor. At last this control circuit can be useful as a part of a long roadway flanked by the urban areas.

Future Scope:

This System Can be upgraded by Replacing Ordinary LED modules with Solar based LED modules. with utilizing the latest technology and advance Sensors. The main object of the Project is to save energy and by doing so we could be able to lighten few more houses. This model can be implemented with few modifications as a source of Revenue; as charging Station for battery operated vehicles.

VII.REFERENCE :

[1].http://opensourceecology.org/wiki/Automation

[2]. S. Suganya, R. Sinduja, T. Sowmiya& S. Senthilkumar, Street light glow on detecting vehicle movement using sensor

[3]. K. Santha Sheela, S.Padmadevi, Survey on Street Lighting System Based On Vehicle Movements

[4]. Srikanth M, Sudhakar K N,ZigBee Based Remote Control Automatic Street Light System

[5]. M.Abhishek, Syed ajram shah, K.Chetan, K,Arun Kumar, Design and implementation of traffic flow based street light control system with effective utilization of solar energy, International journal of Science Engineering and Advance Technology, IJSEAT, Vol 3, Issue 9, September -2015

[6]. C.Bhuvaneshwari, R.Rajeswari, C.Kalaiarasan, Analysis of Solar energy based street light with auto tracking system, International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol 2, Issue 7, July 2013

[7]. Steve Chadwick, “Street Light Monitoring – a Practical Solution magazine” November/December 2002

[8]. "Intelligent Street Lighting System Using Gsm" International Journal of Engineering Science Invention ISSN (Online): 2319 – 6734, ISSN (Print): 2319 – 6726Volume 2 Issue 3 March. 2013

[9]. "Wireless internet lighting control system", Budike, E.S. Lothar (Power web Technologies), US patent 7,167,777, Jan 23, 2007.

Authors profile:

Navya.CH received in ECE Embedded Systems from St.Martins Engineering College, Dhulapally, Seunderabad in 2017. She was graduated in Electronics and Communication Engineering from Scient institute of Technology,Ibrahimpatnam India in 2015.

Authors Profile:

RESHMA BEGUM SHEIK received M.Tech from Bapatla Engineering College,Baptla, and completed her B.Tech in St.Ann's College of engineering and Technology. She is currently working in St. Martins Engineering College, Dhulapally, Secunderabad, India as assistant professor in Dept. of ECE.