International Journal of Engineering & Technology, 7 (2.8) (2018) 291-294

International Journal of Engineering & Technology

Website: www.sciencepubco.com/index.php/IJET

Research Paper

IoT based smart and flexible lightning in streets

Raju Anitha, M. Nishitha*, K. Akhila, K. Sai Anusha, G. Srilekha

Department of Computer Science and Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Guntur, Andhra Pradesh, India -52202.
**Corresponding author E-mail: anitharaju@kluniversity.in*

Abstract

The internet of Things (IOT) is always giving unprecedented answers for the customary issues looked by man. One of the real obstacles in city is we are spending huge expenses on street light. To control the street lights based on detection of sunlight by implemented with smart embedded system. The paper is mainly utilized for smart and climate adaptive lighting in street lights. The street lights are automatically ON during the evening time and automatically OFF during day time. The street light can be accessed to turn ON or OFF at any place and any time through web. In addition to that On top of the street light we are placing camera to track the activities performed on the street and where the recordings are stored in a server. Furthermore a panic button is placed on the pole, If there is any emergency situations like harassment, robbery there is a panic button is available at the reachable height any person can press it if he is in danger. If people are unable to press the panic button, they should use voice recognition which is connected to panic button, when it recognises some commands like help, it automatically press the panic button. Whenever the panic button is pressed, the footages at that time recorded by the camera is sent straight forwardly to the cloud account. The near specific police headquarters can have access of the account by which they can see the incident's spot. Every region's street lights are associated with the specific area's police headquarters and cloud account can be accessible by each of them. Here GSM
Technology is eliminated completely. Safety and energy consumptions can be ensured by this idea.

Keywords: *Streetlight, sensor, microcontroller, panic button, cloud account, CCTV camera, and Raspberry pi.*

1. Introduction

IoT, is a system of web associated articles (or things) that can gather and trade information. It is said that "Internet of things is an invention which machines talks each other with less human interaction" is the combination of the implanted, system, and data advances; and the primary factor that is driving IoT is the extraordinary decrease in the cost of sensors, handling force and transfer speed (broadband), and increment in omnipresent remote scope. Kevin Ashton (who is the "father of the IoT") trusted that IoT could transform the world into information which could be utilized to settle on full scale choices on asset usage and administration. IoT traverses over various areas, and Smart Street light is one such area. In city we are spending large expense on street light. By using smart street light, we can save municipal waste up to 50-70%. Whenever the sunlight is recognized the light will be naturally made OFF and a similar data can be gotten through web, which can be made ON/OFF utilizing IoT. We can access the street light anywhere, anytime through the internet. The controller of the street light is fixed on the pole of the street light along with a microcontroller, sensor and communication between the street lights is based on the controller which is installed on the pole of the street light and the controller controls the LED road lights. Those sensors detect the sunshine and sends those details to the microcontroller which takes after the dependence over the light, provided for the circumstance. Normally we ON/OFF street light manually to avoid these we use smart street lights so everything is self-activating. As per the necessities the control system it turns on-off the lights at required timings. The task is mainly helps to trace the illegal activities happening in the street using panic button and voice recognition. The camera is also present on the street light to record the entire footages happenings on the street. Safety and energy consumptions can be ensured by this idea.

2. Problem Definition

Street light is very expensive as it contains chemical called sodium vapour, which consumes more power. Actually the expense which is spent on the street light can be used for other development of the nation. Due to this there is a heavy loss of energy in the process of switching on/off.
Presently the systems are updated as the lights were set switch on in the evening hours and switch off in the morning hours automatically.

2.1 Limitations of Existing System

- Street lights can be switch on/off manually.
- Due to the chemical called sodium vapour lamps, more energy is consumed.
- It is expensive as the light is ON the complete night.
- The requirement of man power is more and also checking should be done continually.

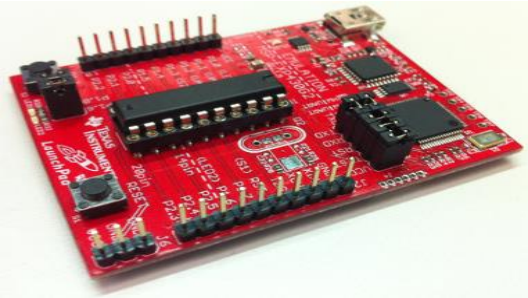
2.2 Advantages of Proposed System

- The streets lights can be switch on/off automatically.
- Due to the replacement of LED energy with sodium vapour lamps, the cost had come down.
- The reduction of co2 is done.
- There is also reduction of light pollution is done.
- We use wireless communication.
- Completely elimination of man power.
- There is no safety for people at present but these systems provide it.

2.3 Material

2.3.1 Microcontroller Msp430

The MSP430 is blended signal microcontroller family. Worked around a 16-bit CPU, the msp430 is intended for ease and particularly low power utilization embedded applications. The msp430 can be utilized for low controlled implanted gadgets. The MSP430 16-bit microcontroller stage of ultra-low power RISC blended signal microprocessors from gives a definitive answer for an extensive variety of low power and versatile applications. This gives vigorous outline support to the msp430 16-bit MCU, including technical documents, training, devices and programming.

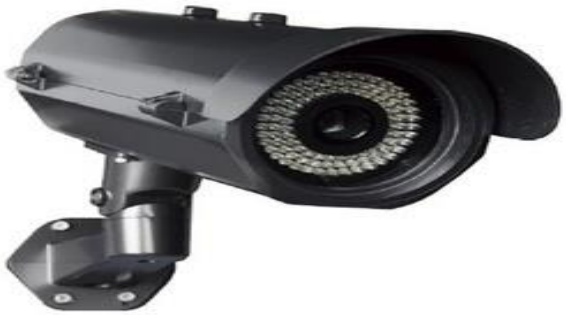


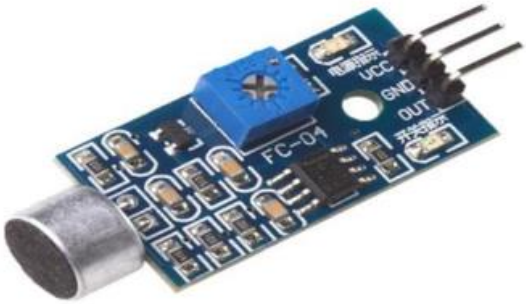
2.4 LDR Sensor

This LDR abbreviated as Light dependent resistor is a photo resistor gadget, whose factor is an element of the electromagnetic radiation. Hence, these are light delicate gadgets which are same as that of human eyes. They were also called as photo conductors, conductive cells or essentially photocells. They are comprised of semiconductor materials with high resistance.

2.5 IP65 Cctv Camera

The IP rating for CCTV camera is the “Entrance Protection” rating. It is a scale that shows the level of fixing for gadgets against remote bodies including instruments, soil, tidy and so on in addition to dampness. With a wide range temperature, it has anti vibration, hostile to stun, against crash and anticorrosion protection. Its lightweight and minimal size takes into consideration adaptable mounting. The majority of I/O connectors and links are completely IP65 evaluated.





2.6 Raspberry pi 8051

Raspberry pi is very easy to connect to the internet. Variety of programming languages used in Raspberry pi. This is a multipurpose sound sensor which can be utilized to detect sound and audio. An installed LED is utilized to show the output status. This computerized output can be directly associated with an Arduino, Raspberry Pi, AVR, PIC, 8051 or some other microcontroller to peruse the sensor yield. We convert the digital output to Analog by using a programming language.

3. Methodology

The structure of the versatile framework has Light Dependent Resistance sensor, MSP430 micro controller, relay transfer, IP65 cc television digicam and panic button. On this machine MSP 430 acts because the brain of the complete system. LDR sensor used in the system is attached to micro controller. LDR is mild based resistor. whilst the daylight falls on it, its resistance decreases and makes the light to interchange off. when the sun set, mild do no longer fall at the sensor, so its resistance decreases and triggers the light to interchange on. relay acts an automated switch that's related to the micro controller by relay driver. It is rather good and automatically switches on and off the lighting fixtures. IP65 CCTV camera is connected to the controller which is used to capture the movements. The camera is water, dirt and corrosion resistant. ‘6’ indicates the level of dust protection .and ‘5’ is fluid protection. The camera is connected to the server so the recorded footages is directly stored in a server. If there is any emergency situations like harassment, robbery there is a panic button is available at the reachable height any person can press it if he is in danger. If they are unable to press the panic button they can use voice recognition, it automatically press the panic button. voice recognisor senses the sound and then we get the digital output. We convert the digital output to Analog by using a programming

language. We will give an instruction for the panic button to be pressed by converting digital signal to Analog signal. Safety and energy consumptions can be ensured by this idea.

4. Implementation

The system is designed exclusively for three main purposes.
• To provide energy consumption.
• To prevent energy wastage.
• To ensure security to the people, especially to prevent women harassment.
The above three purposes are implemented by
• Automatic switching ON and OFF of street lights.
• Panic button is provided at the reachable height of humans.
As soon as the sunrays go away from the detectable region, LDR sensors will trigger the light to switch ON.
Street lights communicate with each other through ZigBee network.
Panic button is fixed at the street light to trigger the system by raising an alarm signal at the nearby police station.
Ip65 camera is installed to capture the entire movements of people moving on the particular street. 8. References:
A Cloud account is maintained to store the footages of camera whenever the panic button is pressed by the people.
Panic button is present at the reachable height i.e., 5 feet of human beings. If a person who is in need of emergency can press the button, if they are unable to press the panic button they can use voice recognition which raises an alarm at the nearby police station. Immediately the officer can check his account to get rid of the happening at the road.

5. Conclusion

The main target of the system is to cut down the two important issues that our country is finding difficult to tackle.
• Wastage of energy.
• Detection of crime.
As the LED bulbs were used, it releases less heat when contrasted with mercury lamps. This system cuts down the cost of conventional system by 50-60% which improves the economy of the country and saves a huge amount of investment as it can be utilized in useful ideas.
The system ensures the security to the people and it provides a great security exclusively for women.
The system can prevent women harassment, thefts and other threats.
The system provides the evidence for the police to catch hold off the culprits.
This methodology is
• Cost efficient
• Reliable
• Prevents manual ON and OFF of lights
• Prevents energy wastage.

References

[1] Archana. G, Aishwarya N, Anitha J “Intelligent Street Light System” International Journal of Recent Advances in Engineering & Technology, Vol-3, Issue-4, 2015.

[2] AkshayBalachandran, Murali Siva, V. Parthasarathi, Surya and Shriram K. Vasudevan “An Innovation in the Field of Street Lighting System with Cost and Energy Efficiency”Indian Journal of Science and Technology,Vol-8, August 2015.

[3] DeepanshuKhandelwal, Bijo M Thomas, KritikaMehndiratta, Nitin Kumar “Sensor Based Automatic Street Lighting system” International Journal of Education and Science Research Review Volume-2, Issue-2 April- 2015.

[4] IsahAbdulazeez Watson, OshomahAbdulaiBraimah, Alexander Omoregie “ Design and Implementation of an Automatic Street Light Control System” International Journal of Emerging Technology and Advanced Engineering, Volume 5, Issue 3, March 2015.

[5] KapseSagar Sudhakar1, AbhaleAmol Anil2, Kudakechetan Ashok3, ShirsathShravan Bhaskar4 “Automatic Street Light Control System” International Journal of Emerging Technology and Advanced Engineering”Volume 3, Issue 5, May 2013.

[6] Mustafsaad, AbdalhalimFarij, Ahamed Salah “Automatic Street Light Control System Using Microcontroller” Mathematical method and Optimization Technique in Engineering ISBN: 978-960-474-339-1.

[7] SaksheeSrivastava, “Electronics And Communication Engineering, Institute Of Technology And Management AL-1, Sector-7, GIDA, Gorakhpur, U.P., INDIA” Advance in Electronic and Electric Engineering. ISSN 2231- 1297, Volume 3, Number 5, 2013.

[8] Prof. K.Y.Rajput, GargeyeeKhatav, Monica Pujari, PriyankaYadav, “International Journal of Engineering Science Invention” www.ijesi.org Volume 2 Issue 3 و March. 2013, PP.60-69”. Volume 2, Issue 3, March. 2013.

[9] L. Jasio, T. Wilmshurst, D. Ibrahim, J. Morton,M. Bates, J. Smith D. Smith and C. Hellebuyck,PIC Microcontrollers: know it all, Publishing Elsevier Science, 2008.

[10] K. S. Sudhakar, A. A. Anil, K. C. Ashok and S. S. Bhaskar, Automatic Street Light Control System, International Journal of Emerging Technology and Advanced Engineering, Vol. 3,May 2013.

[11] Soledad Escolar, JesúsCarretero, MariaCristina Marinescu and Stefano Chessa “Estimating Energy Savings in Smart Street Lighting byUsing an Adaptive Control System” International Journal of Distributed Sensor Networks Volume 2014, Article ID 971587

[12] Samir A. ElsagheerMohamed “Smart Street Lighting Control and Monitoring System for Electrical Power Saving by Using VANET”,Int. J. Communications, Network and System Sciences, 2013, 6, 351-360.

[13] Andrea Zanella, Senior Member, IEEE, Nicola Bui, Angelo Castellani “Internet of Things for Smart Cities” IEEE Internet Of Things Journal, vol. 1, no. 1, Feb. 2014.

[14] J.Sherly1, D.Somasundareswari“Internet Of Things Based Smart Transportation Systems” International Research.

[15] Dr. Seetaiah Kilaru, Hari Kishore K, Sravani T, Anvesh Chowdary L, Balaji T “Review and Analysis of Promising Technologies with Respect to fifth Generation Networks”, 2014 First International Conference on Networks & Soft Computing, ISSN:978-1-4799-3486-7/14,pp.270-273,August2014.

[16] Meka Bharadwaj, Hari Kishore "Enhanced Launch-Off-Capture Testing Using BIST Designs” Journal of Engineering and Applied Sciences, ISSN No: 1816-949X, Vol No.12, Issue No.3, page: 636-643, April 2017.

[17] P Bala Gopal, K Hari Kishore, R.R Kalyan Venkatesh, P Harinath Mandalapu “An FPGA Implementation of On Chip UART Testing with BIST Techniques”, International Journal of Applied Engineering Research, ISSN 0973-4562, Volume 10, Number 14 , pp. 34047-34051, August 2015.

[18] Murali, K Hari Kishore, D Venkat Reddy "Integrating FPGAs with Trigger Circuitry Core System Insertions for Observability in Debugging Process” Journal of Engineering and Applied Sciences, ISSN No: 1816-949X, Vol No.11, Issue No.12, page: 2643-2650, December 2016.

[19] Mahesh Mudavath, K Hari Kishore, D Venkat Reddy "Design of CMOS RF Front-End of Low Noise Amplifier for LTE System Applications Integrating FPGAs” Asian Journal of Information Technology, ISSN No: 1682-3915, Vol No.15, Issue No.20, page: 4040-4047, December 2016.

[20] N Bala Dastagiri, Kakarla Hari Kishore "Reduction of Kickback Noise in Latched Comparators for Cardiac IMDs” Indian Journal of Science and Technology, ISSN No: 0974-6846, Vol No.9, Issue No.43, Page: 1-6, November 2016.

[21] S Nazeer Hussain, K Hari Kishore "Computational Optimization of Placement and Routing using Genetic Algorithm” Indian Journal of Science and Technology, ISSN No: 0974-6846, Vol No.9, Issue No.47, page: 1-4, December 2016.

[22] Meka Bharadwaj, Hari Kishore "Enhanced Launch-Off-Capture Testing Using BIST Designs” Journal of Engineering and Applied Sciences, ISSN No: 1816-949X, Vol No.12, Issue No.3, page: 636-643, April 2017.

[23] N Bala Dastagiri,, K Hari Kishore "Analysis of Low Power Low Kickback Noise in Dynamic Comparators in Pacemakers” Indian Journal of Science and Technology, ISSN No: 0974-6846, Vol No.9, Issue No.44, page: 1-4, November 2016.

[24] Meka Bharadwaj, Hari Kishore "Enhanced Launch-Off-Capture Testing Using BIST Designs" Journal of Engineering and Applied Sciences, ISSN No: 1816-949X, Vol No.12, Issue No.3, page: 636-643, April 2017.
[25] T. Padmapriya and V. Saminadan, "Priority based fair resource allocation and Admission Control Technique for Multi-user Multi-class downlink Traffic in LTE-Advanced Networks", International Journal of Advanced Research, vol.5, no.1, pp.1633-1641, January 2017.
[26] S.V.Manikanthan and K.srividhya "An Android based secure access control using ARM and cloud computing", Published in: Electronics and Communication Systems (ICECS), 2015 2nd International Conference on 26-27 Feb. 2015,Publisher: IEEE, DOI:10.1109/ECS.2015.7124833.