Independent University Bangladesh

Literature Review

Topic - Smart Street Light

Course Information

Course Code	:	CSE216L
Course Title	:	Microprocessor Lab
Section	:	02
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Group Information

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[1]

Literature Review: Smart Street Lights .pdf

Authors : Deepak K. Srivatsa, B. Preethi, R. Parinitha, G. Sumana, A. Kumar

Conference : 2013 Texas Instruments India Educators' Conference

Original Link : Smart Street Lights | IEEE Conference Publication | IEEE Xplore

Summary:

The main objective of the proposed system is to introduce a system in which the LED streetlights are switched on whenever the ambient light intensity falls below a threshold. In actuality, the Smart Street Lights is a project that deals with the intelligent control of illumination of the streets during the off peak hours at night (from 11.30pm to 5.30am say) based on the detection of movement on the road by vehicles (mostly) and pedestrians (if any). The inspiration for this project was obtained from the shortage of power in an ever-increasing power demand scenario in India.

Sensor(s):

- Ambient Light intensity sensor.
- An array of Laser Gates

Microcontroller: MSP430F5529 with an internal RTC, MSP-EXP430F5529

Communication Device: Not specified

Pros:

- This system is to control the intensity of the streetlights between the time intervals of 11.30pm and 5.00 am, detect the movement on the road and increase the intensity of the lights whenever there is movement and reduce the intensity after the movement has passed.
- After implementing this system, the consumption of energy will be reduced.

Cons:

- As it is an automated system it may not work on time or may not detect the movement.
- As per mentioned above it will work from 11.30pm and 5.00 am. it does not function from 6 pm to 10 pm. At that time many roads could be empty and street lights will be brighter. That's why it may consume more energy.

[2]

LiteratureReview: Smart street lights using IoT.pdf

Authors : Lakshmana Phaneendra Maguluri, Yaswanth Sri Venkatesh Sorapalli, Lokesh Kumar Nakkala , Venkat Tallari

Conference : 2017 3rd International Conference on Applied and Theoretical Computing and Communication Technology (iCATccT)

Original Link : Smart street lights using IoT | IEEE Conference Publication | IEEE Xplore

Summary:

Through this writing we will show many alternative ways and pocket-saving electricity systems in cities in which solar energy will be used for the street lights. In this busy world people are in so much rush maintaining a hectic life so the maintenance and the financial power consumption of street lighting systems requires monitoring management more. Usually, the normal or urban areas street light does not keep up the intensity automatically. There is no system to turn ON the lights when it is required and there is no one to turn OFF the lights. So, a rechargeable battery will store the energy which will automatically turn ON whenever there is no sunlight detected through the sensor and turn OFF the light in the presence of the sunlight. In this process, lights can be replaced by LED lights which will save the energy 50%, photovoltaic source and an object carrying PIR sensors will be used developing the system, minimizing the regular electricity expenses.

Sensor : PIR sensor, solar cell arrays,

Communication Device: GSM technology, GPRS.

Microcontroller: MPPT

Pros :

- The presence of sunlight can be detected.
- Prevent wastage of electricity energy.
- Cost Efficient.

Cons :

- Due to 70% of dust the solar panels are lost.
- Use of Mercury and Sodium steam globules can create low-controlled utilization.

[3]

LiteratureReview:

IOT BASED SMART AND ADAPTIVE.pdf

Authors : B.Abinaya , S.Gutupriya , M.Pooja

Conference : 23-24 Feb. 2017, Chennai, India

Original Link : https://ieeexplore.ieee.org/document/7972267

Summary:

The system is primarily used in street lights for smart and weather-adaptive lighting. The project is powered by a smart embedded system that controls the street light based on sunlight detection. The street light turns on automatically at night and turns off automatically during the day. The ON/OFF can be accessed via the internet at any time and from any location. A camera is mounted on top of the street light to record the activities on the road, and the footage is stored on a server. A panic button is also installed on the pole; in the event of an emergency or danger, the person in danger can press this button, which raises an alarm at the nearby police station. When the panic button is pressed, the footage recorded by the camera at the time is sent directly to the cloud account. The account is given to a specific police station so that they can view the location of the incident. Each area's street lights are linked to the local police station, and each has a cloud-accessible account. The manual operation is completely eliminated when using GSM technology. As a result, the system is primarily intended to ensure safety and reduce energy waste.

Sensor: Light Dependent Resistor

Communication Device: Wireless

Microcontroller: MSP430

Pros:

- Cost Efficient
- Reliable
- Prevents manual ON, OFF of lights
- Prevent energy wastage

Cons: Not specified

[4]

LiteratureReview:

IoT-Based Dynamic Street Light Control for Sm…

Authors: Nabil Ouerhani, Nuria Pazos, Marco Aeberli, Michael Muller

Conference : 11-13 May 2016, Yasmine Hammamet, Tunisia

Original Link : https://ieeexplore.ieee.org/document/7746112

Summary:

This paper describes a real-world solution for dynamic street light control and management that is based on an open and adaptable Internet of Things architecture. The use of a unique device connection paradigm based on model-driven communication agents to speed up the integration of sensors and actuators into Internet of Things platforms makes a significant advance at the interoperability level. The findings of real-world experiments with deployed dynamic street lights in urban locations are also presented in the study. When compared to traditional

static, time-based street light control, the proposed dynamic light control approach allows for a 56 percent energy savings.

Sensor(s): luminosity (Environmental sensor), Activity indicator

Microcontroller: STMicroelectronics

Communication Device: ZigBee Interface

Pros:

- No impact on the security perception.
- Solution towards low carbon cities of the future.

Cons:

- Not able to assure the safe operation of the critical infrastructure of street lightning.