Automatic streetlight controller

1 INTRODUCTION

1.1 Overview

It is a simple and powerful concept, which uses transistor (BC 547 NPN) as a switch to switch ON and OFF the street light system automatically.

It automatically switches ON lights when the sunlight goes below the visible region of our eyes. (e.g in evening after Sunset).

1.2 Purpose

The main purpose of this project “automatic street light control with different light intensity” is to minimize the cost & loss of electricity and also man power to manually on- off the street light.

2 LITERATURE SURVEY

2.1 Existing problem

Existing methods like registering the complaint, switching on/off the light manually is time consuming & requires man power.

The new method automatic ON/OFF and fault detection without human intervention is easier when compared to the existing system.

We proposed an automatic light control system which eliminates the disadvantages of the existing systems by taking date and time from the GPS, as it also gives information about the position of the system.

Based on the results the micro controller calculates and automatically detects geographical area and retrieve relevant data for sunrise and sunset in the area, respectively ensures very precise ON/OFF mode of the lighting System. It increases bulb life in result of the dimming effect.

2.2 Proposed solution

We need to save or conserve energy because most of the energy sources we depend on, like coal and natural gas can’t be replaced.

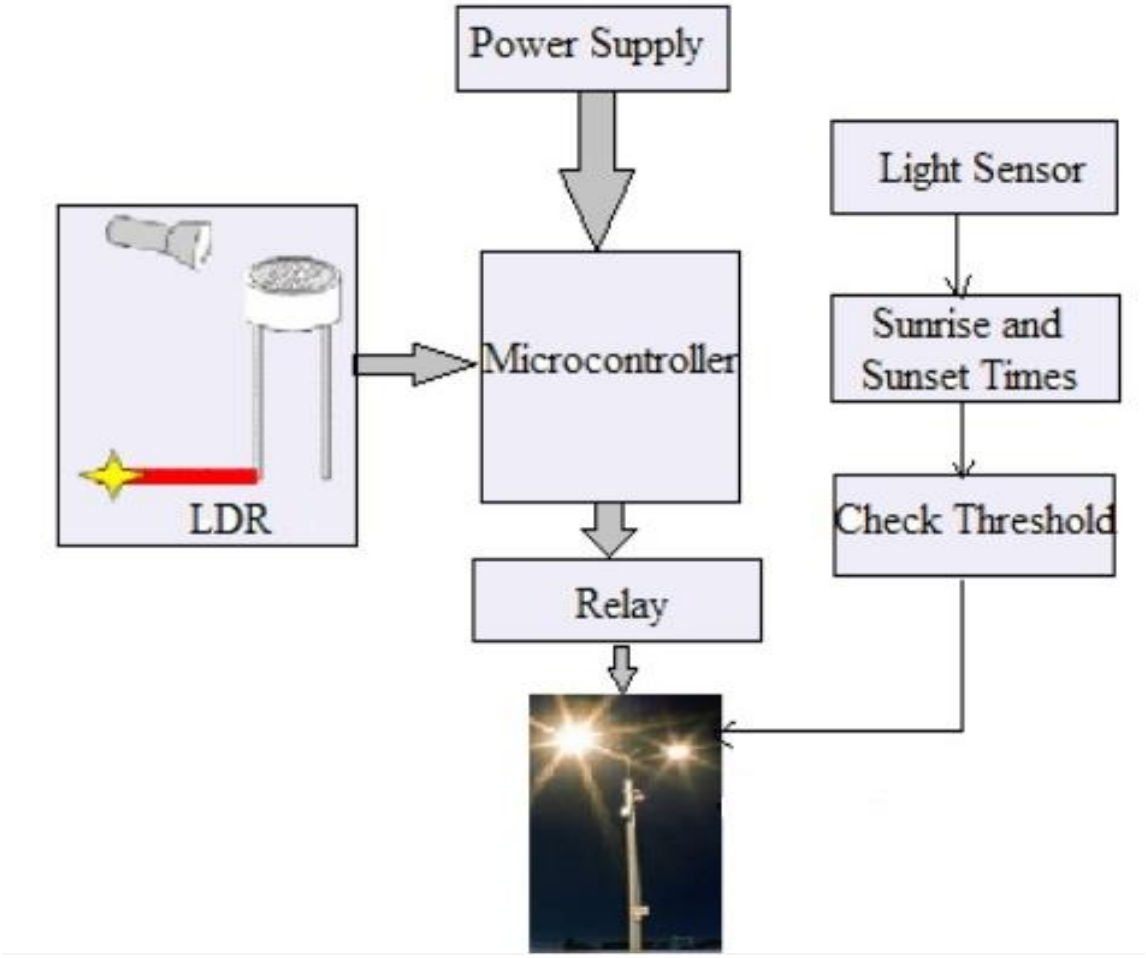
Once we use them up, they’re gone forever. Saving power is very important, instead of using the power in unnecessary times it should be switched off.

In any city STREET LIGHT is one of the major power consuming factors.

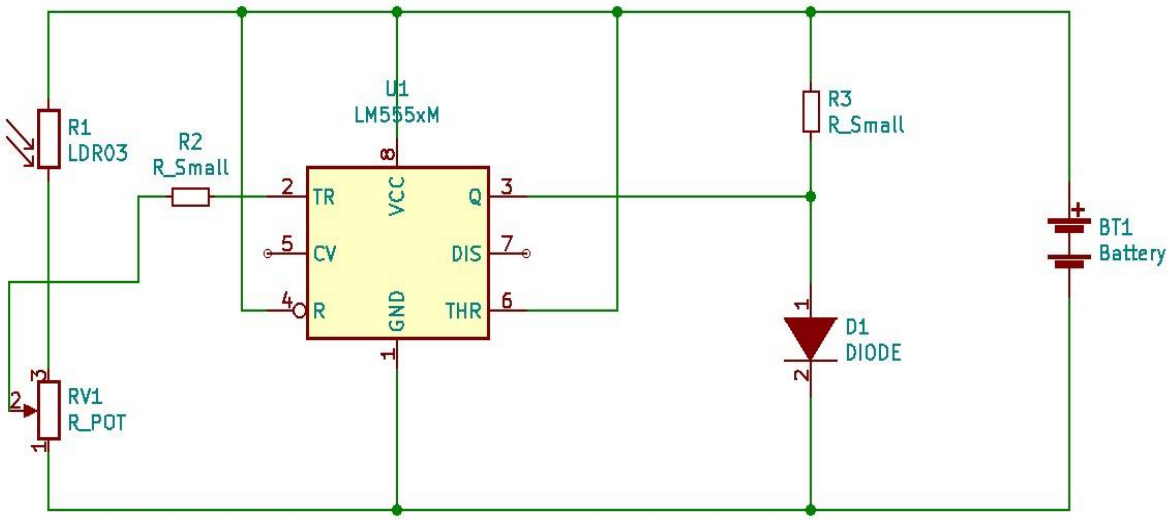
Most of the time we see street lights are ON even after sunrise thus wasting lot of energy.

3 THEORITICAL ANALYSIS

3.1 Block diagram



3.2 Hardware / Software designing

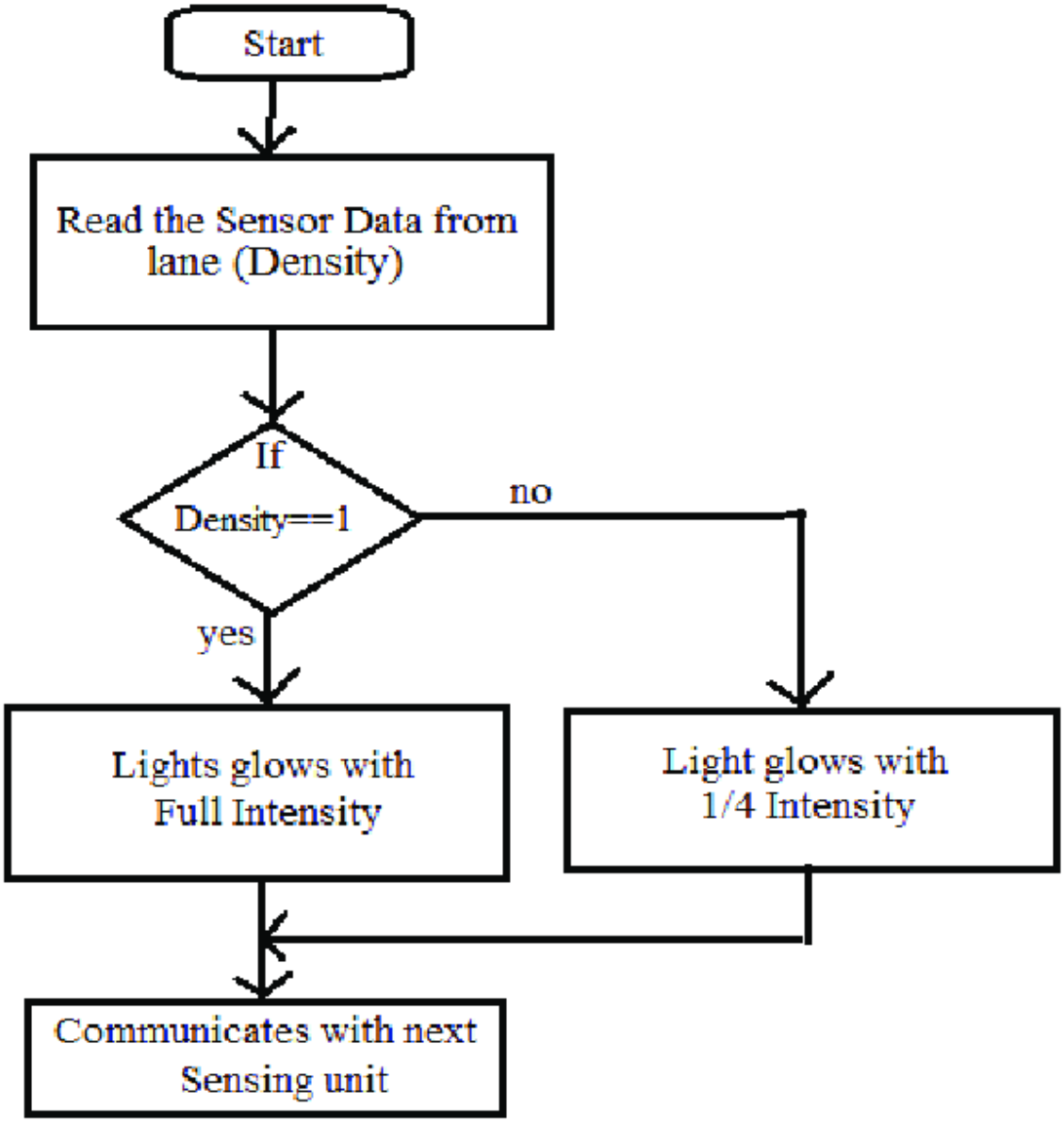


4 EXPERIMENTAL INVESTIGATIONS

The micro controller 'ATmega8' is used as brain to control the streetlight system.

The change in voltage across LDR circuit and the ON and OFF time settings are analyzed by the micro controller and enables the automatic switching operation when the switching conditions are satisfied.

5 FLOW CHART



6 RESULT

It automatically switches ON lights when the sunlight goes below the visible region of our eyes.

This is done by a sensor called Light Dependent Resistor (LDR) which senses the light actually like our eyes.

It automatically switches OFF lights whenever the sunlight comes, visible to our eyes.

7 ADVANTAGES & DISADVANTAGES

ADVANTAGES

Since automatic street light systems feature no moving parts, they require less maintenance than conventional street lights.

The automatic solar street light system is a stand-alone arrangement & therefore requires no external wiring or having to connect with the grid.

There are lower chances of the automatic street light system overheating & risk of accidents is also minimized.

Cost of operating automatic solar street lights is far less when compared to the conventional street lights.

The automatic street light system is eco-friendly & hence helps in reducing the carbon footprint.

Smart solar street lights can be put up in remote areas even in places that are not accessible to the grid.

DISADVANTAGES

The automatic street light system requires a higher initial investment in comparison to conventional street lights.

Generation of energy for solar street light entirely depends upon the climatic conditions.
Risk of theft of the automatic street light system is relatively higher since they are non-wired & are much expensive.

Rechargeable batteries of the automatic street light system are required to be replaced a few times.

Snow, dust or moisture can accumulate of PV panels which can hinder energy production.

8 APPLICATIONS

Government Units & Municipalities – Government organizations can save large sums of money by using an automatic solar street light system for outdoor lighting. It is forecasted that we will have 359 million street lights by 2026.

Corporate & Big Businesses – Many companies nowadays are applying green energy technologies & practices to reduce their carbon footprint. Installing automatic street light system can prove to be a step in this direction.

Great Way to Light Up Streets – Apart from lighting up streets automatic solar street light system along with CCTV can also provide us additional security. Smart solar street lights are wireless & one of the street lighting solutions.

Along Roads & Highways – High-quality automatic street light systems can enhance night-time visibility on rural roads, main roads & highways. These are also very easy to install & are affordably priced.

Parks & Recreational Areas – Areas which are mainly donned by children can make good use of automatic street light systems. They are safe & secure & provide uniform lighting & the right amount of luminosity to parks.

Schools & Universities – Automatic solar street light system is an excellent choice for schools, colleges & universities. With plenty of accessible areas, ranging from bus shelters to parking lots institutions can install them throughout the campus.

9 CONCLUSION

We design and implement an automatic system where in the street lights that are not required through the night can be dimmed.

Additionally, the ambiance of light is checked and lights are turned ON when it is dark and turned OFF during the day.

Our government is striving hard to provide electricity to customers.

Thus this paper once implemented on a large scale can bring in significant reductions in the power consumption caused by street lights.

Here we are saving lot of power without any wastage, by these advanced technologies.

10 FUTURE SCOPE

The system can be powered from a battery, which can be charged during day time by harvesting the solar energy through a solar cell.

The solar energy harvested from sunlight can be stored, inverted from DC voltage to AC voltage using sun tie converter.

The AC voltage can be stepped up and given to the electric grid.

The AC voltage from the electric grid can be stepped down, rectified and used for powering the circuit.

Meanwhile, the street light can also be powered by the A.C. voltage, which is

controlled by a relay switch connected to the switching part of the circuit.

The above mentioned strategy will enable us to harvest solar energy in an effective way for the operation of the circuit and for powering the street light also.

11 BIBILOGRAPHY

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