Study and Design of Efficient Solar Tracking for Optimum Power Output

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Abstract: **The solar based power plants are very essential for our country and particularly for backward areas facing electricity shortage. To address the electricity shortage issues it's very important to deploy latest and emerging concepts of ICT (Information Communication Technology). As for analysis the power crises faced by the consumers are reduced to a great extent with modern solar power plants and its need to monitor and control the solar plants remotely using latest concepts for optimum power output. The paper presents a smart and very dynamic solar tracking approach.**

IndexTerms – PV, LDR, LED

I. INTRODUCTION

Solar energy is that the energy extracted from the rays issued from the sun within the style of heat and electricity solar energy is one amongst the most sources of electricity utilized in our day to day life those who board some secluded areas don't have a correct access to the electricity attributable to the govt. negligence moreover as of the price conjointly it's become price big-ticket and could be a necessary issue of pollution, once it involves victimization fossil fuels, therefore there must be another to contend with this type of limitation. Hence, in such cases, alternative energy becomes the simplest possibility for the folks living there alternative energy on the contrary is clean, silent and reliable with low maintenance and most significantly, its eco-friendly alternative energy resolves the shortage of electricity to nice extent and covers most of the customer's happiness to backward class. In Jammu and geographical region, star electricity performs an excellent role specifically in geographical region division throughout the winter season the govt. PV stands for electrical phenomenon and it merely means that the conversion of sunshine into electricity victimization conductive materials that contains the photovoltaic impact i.e. creation of electrical currents during a material once exposed to lightweight essentially the term is of Greek origin- phos means that lightweight and potential unit is solely a unit of electrical phenomenon. Remote watching at the solar energy plants, maintaining the health of the star PV system is of preponderant importance, and continuous watching is needed. Most of the star PV plants are put in in remote locations, the Operations Maintenance supplier can ought to use all ways that and means that to urge firm data regarding the plant performance daily. The operation and maintenance supplier sometimes can have restricted information of the native climatic conditions and also the impact of the parcel of land on plant performance. once the generation goes down/dips, their engineers/monitoring personnel cannot step outside the room forever to grasp that a part of the plant is under performing arts or if there are weather connected changes at intervals the plant during a massive area setup. So, so as to bridge the data gap and to urge seamless updates regarding plant performance, Remote watching systems are terribly essential. The operations distributed within the PV panels generate no pollution and no emission of greenhouse gases, therefore are quite eco-friendly and are wide most well-liked possibility for the generation of electrical currents. For an equivalent reason these are referred to as clean energy technology.

II. PROBLEM DEFINITION

A lot of research has been done on solar panels using PV cells. But the research has been limited to certain facts therein. The solar power is considered the best alternative for power supply hence the plants need to be monitored properly. The deployment of technical aspects enhances the performance of solar plants like rotation of solar panels as per the intensity of light for optimum output. There are other options also available that can be achieved by solar plants. In this work I am going to test some other options also like use of solar panels for voltage status, alternative option for rotation of solar panels etc. means a very dynamic and automatic solar plant for optimum power supply.

III. METHODOLOGY

In this system LDR sensors are used to detect light from environment. This system has two modes, manual mode and automatic mode. In manual mode, when the user changes the values of tow potentiometers the position of servo motors will also changes depends on the input given by user using the potentiometer. In automatic mode, the LDR in which drop or fall of resistance is more upon increase in the intensity of light, the servomotor will change its angle to the position where it obtains max voltage and hence solar panel during day time when there is fall in resistance on any of the LDR the street lights will turn off and during night time, when there is no fall in resistance on LDR's the lights (LED) are turned On. The whole approach is based on Arduino Uno.

IV. RESULTS

The results are very important for research and development work to prove the problem definition practically. The results obtained are mentioned below:
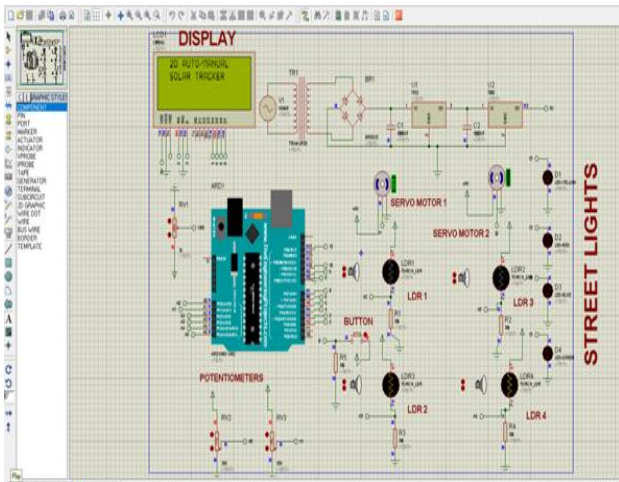

Figure1: User interface of efficient solar tracker in Arduino environment for optimum power output
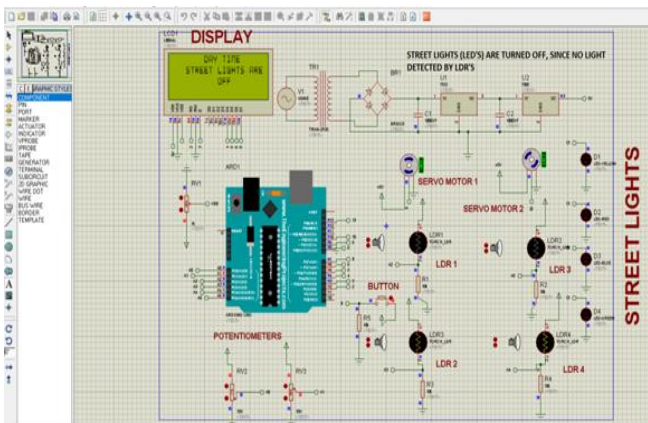

Figure 2: Street lights are turned off, since no light detected by LDR'S
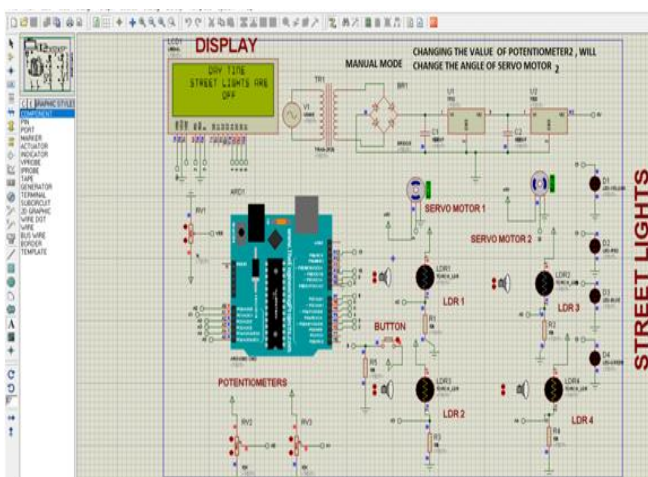

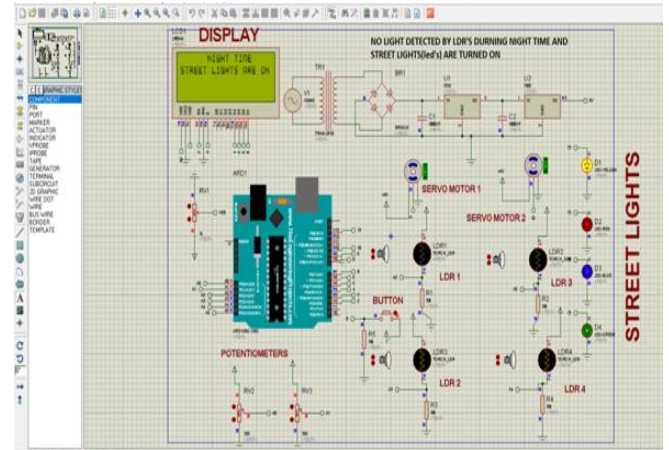Figure 3: Change of servomotor angle with respect to potentiometer

Figure 4: No light detected by LDR'S during night and street lights are turned automatically off
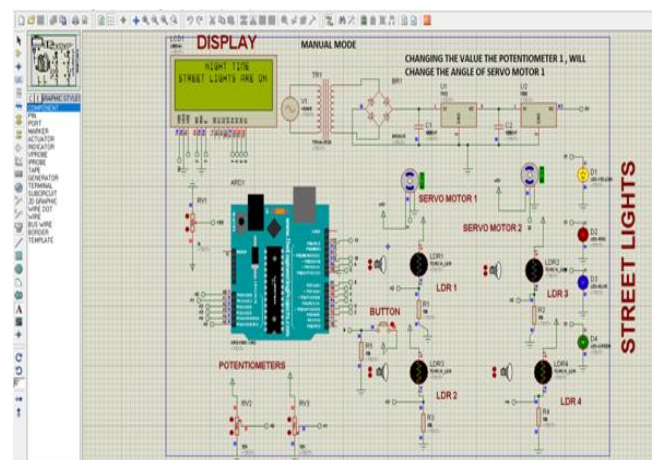

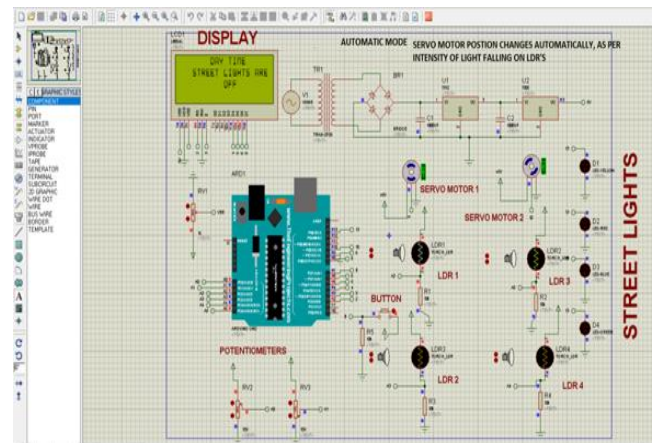Figure 5: Changing of Servomotor angle with respect to Potentiometer (when lights are on)

Figure 6: Position Of Servo Motor changes accordingly with respect to intensity of light

V. CONCLUSION

Implementing renewable energy sources is one of the recommended way of reducing the electricity shortage and environmental impacts. For finest supply it is mandatory to utilize energy generated from renewable sources and monitoring it. Monitoring helps the users in analysis of renewable energy usage and makes system very cost effective the overall research work presents a modern and

intelligent solar tracking approach supporting both manual rotation using potentiometer and automatic rotation using embedded code.

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