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Automatic Street Light using Solar and Piezoelectric Sensor

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Abstract: ***The paper is designed for LED based street lights with auto intensity control, powered by Solar Energy and Foot Step Power Generation. The intensity control is achieved through a Arduino based Microcontroller Board. 12V Battery is used to Power the Automatic Street Light System. To Charge this Battery we have used a Dual Power Source, i.e. Solar Energy and Foot Step Power Generation using Piezo.***

Keywords: Piezoelectric sensors, Battery, LDR, Footstep power generation. Battery, ardiuno

I. INTRODUCTION

Solar street lights are raised light sources which are powered by photovoltaic panels generally mounted on the lighting structure or integrated in the pole itself.The photovoltaic panels charge a rechargeable battery, which powers a fluorescent or LED lamp during the night.Most solar panels turn on and turn off automatically by sensing outdoor lightusing a light source. Solar streetlights are designed to work throughout the night.Many can stay lit for more than one night if the sun is not available for acouple of days[1]. Older models included lamps that were not fluorescent or LED.Solar lights installed in windy regions are generally equipped with flat panels to better cope with the winds.Latest designs use wireless technology and fuzzy control theory for battery management. The street lights using this technology can operate as a network with each light having the capability of performing on or off the network.The development of solar cell technology begins with 1839research of French physicist Antoine-Cesar Becquerel. He observed the photovoltaic effect while experimenting with a solid electrode in an electrolyte solution[2].

II. . LITERATURE STUDY

This paper has presented the advance use of the new technology in the fully automated street lights. Solar panel is environment friendly which is one of the best part of research paper for providing the power source to the battery and drive DC loads according to the footsteps falling on the mat and intensity of sun. it will be implement to the domestic and agricultural purposes .

III. PROBLEM STATEMENT

In a recent time there are many types of street lights is available in the market, but they are not automatic control . In today life the utilization of power turns to be necessary for each work So, we tried to solve this problem This technique used to deliver power is very much an efficient and eco well disposed approach to create power. In addition it likewise does not impact the environment moreover.. solar and piezo operated automated As awareness for solar energy is increasing, more and more individuals and institutions are opting for solar energy. Photovoltaic panels are used for charging batteries by converting the sunlight into electricity. Embarked piezoelectric transducer, which is an electromechanical converter, undergoes mechanical vibrations therefore produce electricity.

IV. MAIN COMPONENTS

A. Arduino Microcontroller Board
B. LCD Module
C. 12V Solar Panel
D. 12V Battery
E. Piezo Electric material Array for Foot Step Power Generation
F. LDR Sensors
G. White LED Array – for Street Light
H. Voltage Regulators
I. LM317 based Charging Circuit
J. Filter Capacitors
K. 12V Relay Module

V. WORKING

The paper is designed for LED based street lights with auto intensity control,powered by Solar Energy and Foot Step Power Generationa as shown in fig 1. The intensity control isachieved through a Arduino based Microcontroller Board. 12V Battery is used to Power the Automatic Street Light System.

To Charge this Battery we have used a Dual PowerSource, i.e. Solar Energy and Foot Step Power Generation using Piezo..Intensity of street lights is required to be kept high during the evening hours. As the traffic on the roads tend to decrease slowly in late nights, the intensity can be reduced progressively till morning to save energy. Thus, the street lights are switched ON at the Evening and then switched OFF at the Morning automatically passing through gradual reduced intensity The process repeats every day. The auto ON / OFF Mechanism during Day and Night time is carried out by LDR Sensor. [3]This System is also equipped with DC Pump for agriculture Purpose. An On / Off Button is interfaced with Arduino Microcontroller to Switch On / Off the Pump. LCD 2x16 Module is used to display the status of Street Light and Pump On / off condition[4].

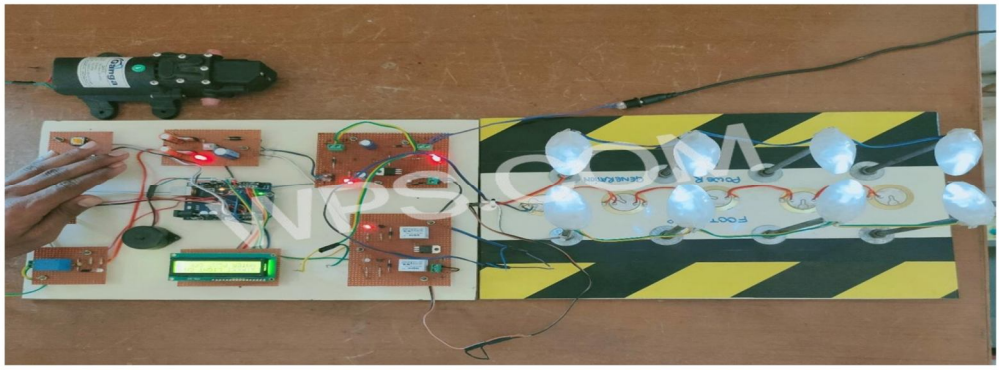

Fig. 1 Automatic Street Light With On Condition

VI. RESULT AND DISCUSSION

After Integrating all the components which we are going to use we assembled all this our automatic street lights is ready for testing. presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using According to this paper t the intensity of the LED's lighting will be control with the help of LDR sensor .The working of LDR is inversely proportional to sun light, so in the presence of sunlight the street lights are in the inactive state and in the absence of sun light the street lights are in active mode.

VII. CONCLUSION

After studying all this it is conclude that the In this project "Automatic Street Light Using Solar And Piezoelectric Sensor" to run the LED lights, the agricultural motors. It can be implemented which is best economical, affordable solution to the energy crisis. As India is a developing country where energy management is a big challenge for huge population. By using this project we can drive DC loads according to the footsteps falling on the mat and intensity of sun. it will be implement to the domestic and agricultural purposes .

VIII. ACKNOWLEDGEMENTS

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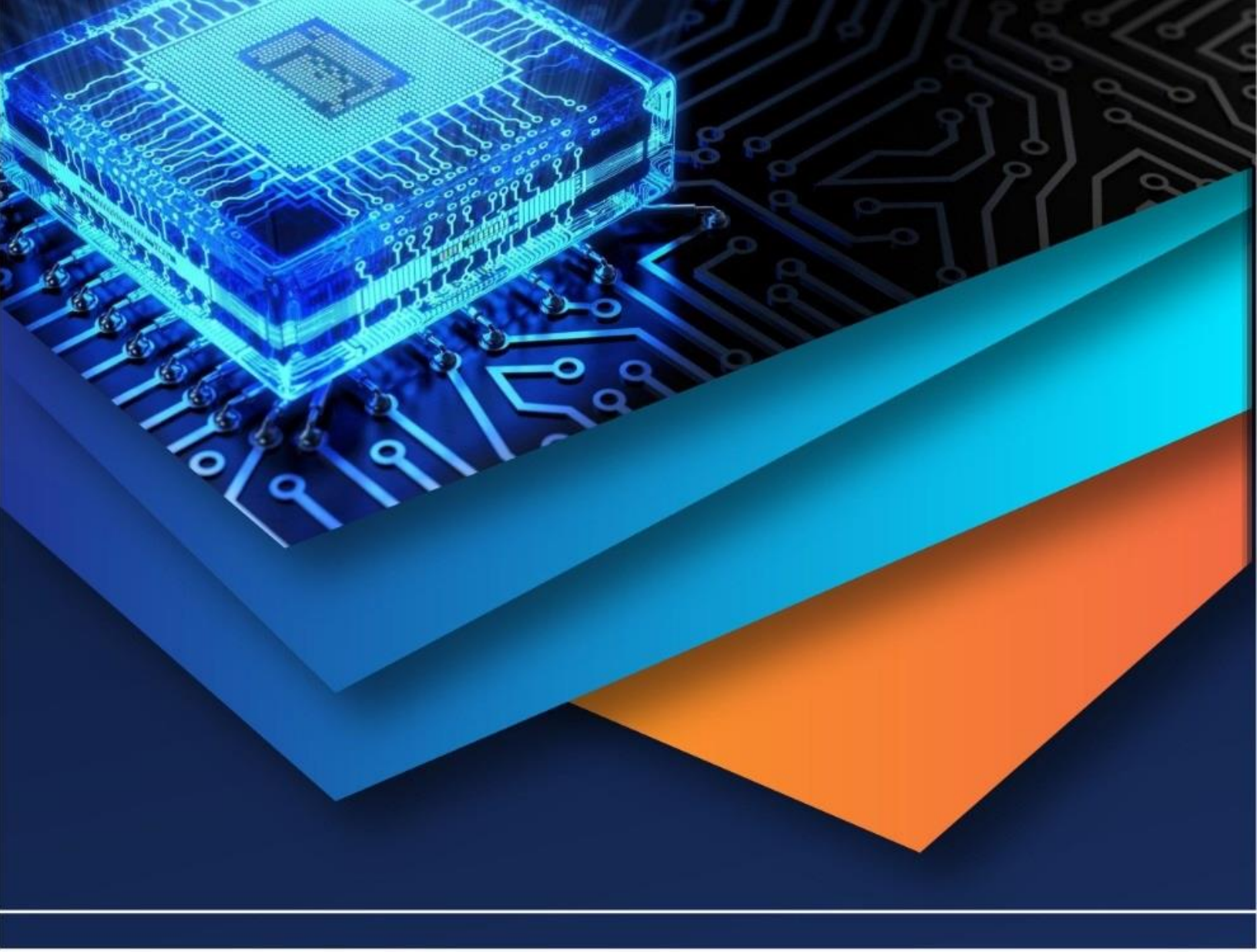

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