Final Year Project Report

Solar Power System
With Solar Tracking

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SOLAR POWER SYSTEM
WITH SOLAR TRACKING

Project Report submitted to the
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Abstract

Renewable energy is rapidly gaining importance as an energy resource as fossil fuel prices fluctuate. One of the most popular renewable energy sources is solar energy. This report describes the design and development of a 'microcontroller based solar tracking system'. Solar tracking enables more energy to be generated because the solar panel is able to maintain a perpendicular profile to the sun's rays. As such, it is vital that those in engineering fields understand the technologies associated with this area. The project includes the design and construction of a Solar Power system and Microcontroller-Based Solar Tracking Control. These systems are controlled using PIC16F877A Microcontroller. This project also covers the designing and construction of the Solar Power and Tracking mechanical structure together with the associated electronic circuits like Solar Charge Controller and Power Inverter. Two Stepper motors is used in this project. One motor mounted to control the altitude angle, and second motor for the elevation angle. Two pairs of Light sensors (CdS) were installed for detecting the light source position. The PIC16F877A is programmed using PIC Basic Pro language in Proton IDE. A working system will ultimately be demonstrated to validate the design. Problems and possible improvements will also be presented.

Dedication

To our parents they appreciates, encouraged and inspired us throughout the our journey of education and specially in project

Very special thanks to our project advisor Khan M Nazir who give us a great support in designing, developing and all other technicalities in the project

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As with any other text, the number of individuals who have made it possible for exceeds those whose names grace the cover. At the hazard of leaving someone out, I would like to explicitly thank the following respective individuals for their priceless contribution and commitment towards in accomplishing this project proposal.

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I would also like to thank my family members for always being there to support me all the time and give me the courage and strength that are necessary for me to carry on with this project.

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1.1 Introduction

As the range of applications for solar energy increases, so does the need for improved materials and methods used to harness this power source. There are several factors that affect the efficiency of the collection process. Major influences on overall efficiency include solar cell efficiency, intensity of source radiation and storage techniques. This makes it particularly difficult to make considerable improvements in the performance of the cell, and hence restricts the efficiency of the overall collection process. Therefore, the most attainable method of improving the performance of solar power collection is to increase the mean intensity of radiation received from the source.

1.2 Motivation

Currently many private companies assembles solar power systems for commercial and residential purpose, but the systems are not efficiently deliveries the power, due the lack of using the tracking techniques. Due to this reason user have to pay more amount for mounding more panels for desired power.

We have to design and develop a solar power system that gives as 30% more power as compare to normally available system in market. This will be done by using tracking techniques We have to design such type of system that should be affordable, reliable, and with best features.

1.3 Previous Work

Many systems were developed by students but they were only focused on solar power system. Solar power with tracking is just like the car with turbo that accelerates the performance of car engine.

1.4 Aim of Project

Essentially, there are two main objectives that are accomplished by doing this project:

a. Design and development of efficient solar power system.

b. To design and construct a 2-axis solar tracking system for moving base (vehicles, robots, and etc.).