Proceedings of the 2012 International Conference on Industrial Engineering and Operations Management
Istanbul, Turkey, July 3 – 6, 2012

Realization of an Automatic Solar Tracker for a Concentrator

Malika Yaici and Soraya Tighidet
Computer Department
University of Bejaia
Bejaia, Algeria

Abstract

The energy produced by high-concentration solar thermal and photovoltaic systems is directly related to the amount of solar radiations absorbed the system, and it is therefore necessary to track the sun's position with a high degree of accuracy. Compared to a fixed mount, a single axis tracker increases annual output by approximately 30%, and a dual axis tracker by an additional 6%. Active trackers use motors and gear trains to direct the tracker as commanded by a controller responding to the solar direction. The aim of our research work is to conceive and realize a solar tracker for a solar panel. Java will be used to implement a friendly user interface to allow the remote control of the solar tracker and the display of the data transmitted by the sensors in the form of graphs. The results may be registered on files for future treatments. The control function will be implemented using the C-language (for compatibility with native Java) to compute the different parameters of the solar tracker such as tilt angle and rotation of the solar collector to allow a maximum solar radiations capture. Finally we hope constructing a solar concentrator completely controlled by a remote program via internet.

Keywords
Energy engineering, Computer and Information systems, Sun tracking system, User Interface