DEVELOPMENT OF A TIME CONTROLLED BASED SOLAR RADIATION TRACKING SYSTEM

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Abstract
The increase in daily use of electricity with limited in the amount of fossil fuel necessitated researchers to explore other methods of producing energy. Many renewable sources of electricity are in existence, one of the cheapest, free and the most abundant renewable source of energy is the electricity generated from the sun. Electricity from solar radiation is environmentally friendly as it poses no harmful hazard to the surrounding. Today, radiation from the sun can be harnessed with the use of the photovoltaic material like the solar panel. It was observed that the sun direction keeps changing during the day as a result of the rotation of the earth and obtaining maximum amount of solar energy from a fixed solar panel cannot be totally achieved throughout the day. To this extend, a time controlled base solar radiation tracking system was developed. The developed system is capable of continuously changing the direction of sun module as the sun transverse the sky with the use of an intelligent fuzzy rules base on input variations. The performance of the tracking system when compared with the fixed solar device gave an output of 19.54% increase in voltage output.

Keywords: Sun, Energy, Radiation, Tracking, Time, Panel

Introduction
Energy is the prime factor in the development of a nation. An enormous amount of energy is extracted, distributed, converted, and consumed in the global society daily. About 85% of energy production is dependent on fossil fuels. The resources of fossil fuels are limited and their use results in global warming due to emission of greenhouse gases (Rajan *et al*,2016). Worldwide shape adjustment and the energy crisis promotes the improvement of renewable energy. Solar electricity has gained a lot greater cognizance because of infinite and green capabilities (Xiaoshan *et al*, 2013).

Nowadays, the improvement of the electricity industry keeps changing with time. The change in methods of generating the power pushes the energy producing industry to a new level of using different means of energy generation from the earth surface and this also prompt mankind continually looked for environmental friendly kind of electric powered energy for sustenance (Shyngs *et al*, 2013). Today, it is closely observed that most of the energy from the sun is absorbed when the panels surface is perpendicular to the sun. Desk bound mounted PV (Photovoltaic) panel are usually perpendicular to the sun once a day and the principal research it is always to get maximum amount of energy base on motion from sun direction (Sharad *et al*, 2015). The apparent motion of the sun is shown in Figure 1. Solar energy is likewise a radiant light and heat from the sun harnessed the use of a variety of ever-evolving technology consisting of sun heating, photovoltaic solar thermal energy and artificial photosynthesis (Sivasakthi *et al*, 2016).