

## **GPS based portable dual-axis solar tracking system using astronomical equation**

### **ABSTRACT**

The overall objective of this study is to design and develop a portable dual-axis solar tracking system that focuses on portable and mobility purpose. This paper discusses the design, electronic control system and the algorithm based on the astronomical equation. The tracking system utilizes the GPS module and a digital compass sensor for determining the location and the heading feedback of the system respectively. Moreover, the microcontroller based tracking system is embedded with a PID controller for which will increase the PV positioning accuracy based from the feedback signal of the absolute encoder. Furthermore, this paper also analyses and compares the performance between the fixed-tilted PV panel and the developed portable solar tracking system.

**Keyword:** Portable solar tracker; Dual-axis; GPS system; PID controller