Abstract

This paper proposes an improved model approach to single diode PV model by Hybrid Genetic Algorithm Particle Swarm Optimization (Hybrid GA-PSO) technique. The main objective is to extract accurate parameters of PV model for the simulator developers which could help them to develop an enhanced PV model in Matlab/Simulink environment. Specifications provided by the manufacturer's data sheet of PV module have been used for the computation of model parameters. Hybrid approach of GA and PSO is purposely chosen to utilize their effectiveness in these kinds of applications. This method is used to optimize the parameters Ipv, a, Rse and Rsh with their best optimal values. For the confirmation of accuracy and computational time of the proposed method, poly-crystalline PV module (KL070) has been selected and the best optimal value of each parameter has been obtained using Hybrid GA-PSO. Finally, the extracted values have been used in the single diode PV model and tested for various irradiations and temperatures. The proposed methodology results in marked improvement and can be a tool for simulator developers who require absolute and accurate model.
A Comprehensive Analysis for Extracting Single Diode PV Model Parameters by Hybrid GA-PSO Algorithm


- Horia Andrei, Costin Cerpetoi, Sorin Dan Grigorescu Traian Ivanovic, Paul Andrei, &quot;Modelling Of The Pv Panels Circuit Parameters Using The 4-Terminals Equations And Brune's Conditions&quot;; Scientific Bulletin Of The Electrical Engineering Faculty – Year 10 No. 1 (12).


- Jing Jun Soon, Kay-Soon Low &quot;Optimizing Photovoltaic Model Parameters for Simulation&quot;; 978-1-4673-0158-9/12/2012 IEEE.
A Comprehensive Analysis for Extracting Single Diode PV Model Parameters by Hybrid GA-PSO Algorithm

Index Terms

Computer Science
Algorithms

Keywords

Hybrid GA-PSO  Photo voltaic  poly crystalline  MATLAB