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Abstract

Intelligent Neural Network Program Based on Revolutionary Predictive Control for a System Tracking

Wassila Issaadi
University of Bejaia, Algeria

Abstract:

To increase the power output of a PV module or a field of PV modules, an electronic controller is incorporated between the PV generator and the load, whose role and main objective is the continuous monitoring of the maximum power point of the PV generator commonly known as MPPT (Maximum Power Point Tracking) and this in general per action on a DC-DC conversion device. The regulation and control techniques provide the impedance matching function, transferring to the load the maximum electrical power output from the PV generator in any the temperature and sunshine conditions. The development of a revolutionary method based on neural algorithms for the prediction of an instantaneous command is the main objective in our work. Indeed, the paper presents a new control strategy for the photovoltaic PV, it is a command based on Neuronal Network technique. It is the first time that this technique has been introduced and proposed by the authors in synthesizing control laws for the converters of electronic power. The new technical algorithm based on Neural Networks, is designed to be more robust in performance with respect to tracking speed and precision. Moreover, this new successful technical research, provides a robust neural structure compared to the noisy empirical data used for the prediction of the command. Consequently, a smooth control signal without oscillation, targeting exactly the expected optimal control with an independent control of the sampling frequency of the system. This study, which is followed by a simulation, has enabled us to consolidate the idea that the new Neural Network controller when compared to their classical counterparts, and obtains the best performances concerning the speed of tracking and precision. The robustness of the networks of neurons opposite the noise of measurements, like, the smoothness of the power signal of PV system generated during the application of the neuronal order, will qualify this command as a practical alternative to the disadvantages recorded on the levels of the classical methods.

Biography:

WASSILA ISSAADI is a Doctor of Sciences in Department of Automatique & Electronic, University of Bejaia, Algeria and received her PhD degree in September 2016, she obtained the Magister degree in 2013, and the diploma of state engineer in 2011. Her current research interests include Robotics, Automatics, adaptives and robust control, Photovoltaics and its Controls, Artificial Neural Network and Fuzzy Logic Theory. She is author of many research papers published at both International and National journals (Elsevier and IEEE), Conference proceedings. Now she works as Editor for Nova Science Publisher and Springer Publisher for two collections of Book in Robotics and Renewable Energy, and also Guest Editor for upcoming collection for the journal Advances in Mechanical Engineering for publisher Sage. She is an Editorial Board Member for repute in International Journals.

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