

Maximum Power Point Tracking Using Fuzzy Logic Control for a Stand-Alone PV System with PI Controller for Battery Charging Based on Evolutionary Technique

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Abstract : This paper introduces the application of Fuzzy Logic Controller (FLC) to extract the Maximum Power Point Tracking (MPPT) from the PV panel. In addition, the proportional integral (PI) controller is used to be the strategy for battery charge control according to acceptable performance criteria. The parameters of the PI controller have been tuned via Modified Adaptive Accelerated Coefficient Particle Swarm Optimization (MAACPSO) technique. The simulation results, using MATLAB/Simulink tools, show that the FLC technique has advantages for use in the MPPT problem, as it provides a fast response under changes in environmental conditions such as radiation and temperature. In addition, the use of PI controller based on MAACPSO results in a good performance in terms of controlling battery charging with constant voltage and current to execute rapid charging.

Keywords : battery charging, fuzzy logic control, maximum power point tracking, PV system, PI controller, evolutionary technique

Conference Title : ICPCE 2019 : International Conference on Power and Control Engineering

Conference Location : Paris, France

Conference Dates : August 27-28, 2019