Nature-Inspired Dragonfly MPPT Algorithm for Solar PV System

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Abstract:

In recent years, renewable energy attracts the researchers interest due to its environment free nature and abundant availability. Solar photovoltaic (PV) is widely used to generation power from the sun light. Major issue in solar PV power generation is tracking the peak power from the available multiple power peaks in the operating points. A proper MPPT algorithm is required to capture the maximum power point (MPP) from the characteristic curves of a solar PV under partial shaded conditions (PSC). An optimized maximum power point tracking (MPPT) and fault classification in solar PV systems are presented in this research work. To select the best optimization model for MPPT under PSC, the nature-inspired dragonfly algorithm (DA), is used in this work to evaluate the Maximum power $(\mathrm{P_{max}})$, MPPT power (MPPTP), and tracking efficiency (TE) of the solar PV systems. From the simulation results, DA priveds a 94.66% TE. Similarly, the proposed algorithm exhibits a Pmax of 774.63 watts and MPPTP of 733.37 watts.

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