Power Production Optimization of Model-Free Wind Farm using Simulated Annealing Algorithm

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Abstract

This research set to appraise the potency of Simulated Annealing (SA) based method within enhancement of wind farms' power generation performance. Horns Rev Offshore Wind Farm with a total magnitude of 80 wind turbines was hereby replicated to study the recommended SA based method. Core objective of the simulation then focused maximization of power output through parametric fine-tuning of individual wind turbine through the SA based method. Recorded findings on boosted convergence rate, elevated accuracy and magnified power production consequentially verified efficacy of the SA based method towards operational improvement of wind farms.

Keywords: Simulated Annealing; Model-free; Wind farm optimization; Power Production; Random-walk; Renewable Energy.