

Performance Evaluation of Random Search Based Methods on Model-Free Wind Farm Control

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Conference paper

First Online: 28 April 2018



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Part of the [Lecture Notes in Mechanical Engineering](#) book series (LNME)

Abstract

This paper investigates the performance of Sequential Random Search (SRS), Fixed Step Size Random search (FSSRS), Optimized Relative Step Size Random Search (ORSSRS) and Adaptive Step Size Random Search (ASSRS) methods on maximizing offshore wind farms power production. The RS based methods are used to tune the control parameter of each turbine to its optimum until the wind farm total power production is maximized. The validation of this investigation is performed using the Horns Rev wind farm model with turbulence interaction between turbines. Simulation results show that Optimized Relative Step Size Random Search (ORSSRS) produces higher total power production as compared to other types of RS based methods.

Keywords

Random search Model-free Wind farm optimization Power production

Stochastic search Renewable energy