

Model-free Wind Farm Control Based on Random Search

Mohd Ashraf Ahmad, Mok Ren Hao, Raja Mohd Taufika Raja Ismail, Ahmad Nor Kasruddin Nasir
Instrumentation & Control Engineering Research Group (ICE)
Faculty of Electrical & Electronics Engineering
Universiti Malaysia Pahang
26600 Pekan, Pahang, Malaysia
mashraf@ump.edu.my

Abstract—This paper explores a model-free approach based on the random search (RS) algorithm for maximizing wind farms power production. The RS based approach is utilized to find the optimal control parameter of each turbine in maximizing the wind farm total power production. The Horns Rev wind farm model with turbulence interaction between turbines is used to validate the proposed approach. Simulation results demonstrate that the random search approach produces higher total power production as compared to the existing method.

Index Terms—Random search, model-free, wind farm optimization, power production, stochastic search, renewable energy.