

Documents

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An adaptive pitch control strategy for a doubly fed wind generation system

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Abstract

A smart pitch control strategy for a variable speed doubly fed wind generation system is presented in this article. Nonlinear as well as linearized dynamic models of the wind system pitch controller and the doubly fed induction generator including the drive train are developed. A PI controller is employed to generate the appropriate pitch angle for varying wind speed conditions. An adaptive artificial neural network (ANN) is trained to produce PI gain settings for various wind speed conditions. The training data, on the other hand, was generated through differential evolution (DE). Simulation studies show that the DE based adaptive ANN can generate the appropriate control to deliver the wind power to the generator efficiently with minimum transients. The data used was collected from the wind generator located at the King Fahd University beach front.

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