Abstract

This paper presents the design and simulation of adaptive PI controllers for doubly fed induction generators using b-spline neural networks. The control structure is based on a back-to-back arrangement where the interest variables are regulated by PI linear controllers. Also, to deal with the nonlinear and uncertain system conditions, we proposed that the control parameters are updated online. The main task is that the power converters operation adapt by itself during the grid changes. Then, the basic problem consists of tuning the PI controllers simultaneously when the system and load are subjected to disturbances. The applicability of the proposal is demonstrated by simulation in a three-node grid, where one end is an infinite bus and the other connects the wind system, between them there are two transmission lines. The results show that the proposed controllers' tuning is comparable to that obtained by a conventional
design, without requiring of a detailed model, which enable optimal speed tracking for maximum energy capture from the wind.

References


Index Terms

Computer Science
Control Systems

Keywords

Adaptive PI Controllers, B-spline Artificial Neural Network, Induction Generators.