

عنوان مقاله:

Improved Power System Dynamic Stability by DFIG in the Presence of SSSC Using Adaptive Nonlinear Multi-Input Backstepping

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خلاصه مقاله:

In this paper, Doubly Feed Induction Generator (DFIG) improves the dynamic stability of the power system in the presence of Static Synchronous Series Compensator (SSSC) using nonlinear control theory. The control method used in this study is based on the nonlinear multi-input adaptive backstepping control. The control signals are assigned to DFIG and SSSC and synchronous generator excitation system. The applied control method is more effective than the conventional linear and nonlinear ones which are reported in the literature. Also in this study, control inputs are designed considering their appropriate constraints. The controller coefficients are optimally selected using intelligent algorithms that increase the performance of the controller in terms of achieving stability. The designed control is robust against parameter variations and load changes as well as changing in the location of the disturbances. This method is simulated in two aspects of the synchronous machine model as a third-order model and a second-order one. The methods are implemented on a 39-bus IEEE system and the simulation results show the effectiveness of the proposed control mechanism.

کلمات کلیدی:

Dynamic stability, DFIG, SSSC, Multi-input adaptive backstepping, Intelligent algorithm

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