عنوان مقاله:

Type ۲ adaptive fuzzy control approach applied to variable speed DFIG based wind turbines with MPPT algorithm

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خلاصه مقاله:

In this research, a Type ۲ adaptive fuzzy controller approach is formulated and designed to be applied to variable speed doubly fed induction generator-based wind turbines directly connected to the grid. It brings this study to evaluate the whole operation of the system to capture the highest rate of power in the wind turbines. The controlling approach is considered to keep the stator reactive power to the ideal value. In contrast to the other researches, here the controlling technique is developed through the nonlinear systems. By the aim of making progress in system operation, in contrast with the Type ۱ adaptive fuzzy system, type two adaptive fuzzy theory is proposed to approximate a large number of uncertainties and the dynamic nonlinearities, exists in tracking errors which may limit the system performance. Feedback linearization control approach helps us to algebraically alter the system into a linearized plant. Thanks to the Lyapunov theorem, the introduced type two adaptive fuzzy approach is proved to meet the uniformly ultimately boundness (UUB) property. On the other hand, it results better tracking function. The simulation outputs represent that the proposed technique is robust enough in presence of parameter variations and unstructured uncertainties.

کلمات کلیدی:

Adaptive, Type ۲ fuzzy, DFIG, Wind turbine, variable speed