

Intelligent power system controller design

Authors

Kamel Saoudi, Ziyad Bouchama, Mouloud Ayad, Mourad Benziane, Mohamed Naguib Harmas

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Description

In this paper, a type-2 fuzzy-based adaptive sliding mode power system controller is proposed for damping low-frequency oscillations with the aim to enhance power system stability despite model uncertainties introduced by variations of system parameters and external disturbances. Addressing these latter, type-2 fuzzy systems approximating properties are used to approximate unknown power system non-linear dynamics. Furthermore, to achieve more robustness, the proposed controller design is combined with sliding mode approach. The latter and Lyapunov synthesis approach are incorporated in an adaptive fuzzy control scheme such that the derived controller is robust, closely tracking any changes in power system operating conditions and guaranteeing stability while a PI control term is added to mitigate chattering. Proposed stabiliser robustness has been tested on a single machine infinite bus system and a ...