Parallel distribution compensation PID based on Takagi-Sugeno fuzzy model applied on Egyptian load frequency control

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Abstract

This paper presents a new technique for a Takagi-Sugeno (TS) fuzzy parallels distribution compensation-PID'S (TSF-PDC-PID'S) to improve the performance of egyptian load frequency control (ELFC). In this technique, the inputs to a TS fuzzy model are the parameters of the change of operating points. The TS fuzzy model can definite the suitable PID control for a certain operating point. The parameters of PID'S controllers are obtained by ant colony optimization (ACO) technique in each operating point based on an effective cost function. The system controlled by the proposed TSF-PDC-PID'S is investigated under different types of disturbances, uncertainty and parameters variations. The simulation results ensure that the TSF-PDC-PID'S can update the suitable PID controller at several operating points so, it has a good dynamic response under many types of disturbances compared to fixed optimal PID controller.

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