Design and Experimental Investigation of a Decentralized GA-Optimized Neuro-Fuzzy Power System Stabilizer

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Abstract

The aim of this research is the design and implementation of a decentralized power system stabilizer (PSS) capable of performing well for a wide range of variations in system parameters and/or loading conditions. The framework of the design is based on Fuzzy Logic Control (FLC). In particular, the neuro-fuzzy control rules are derived from training three classical PSSs; each is tuned using GA so as to perform optimally at one operating point. The effectiveness and robustness of the designed stabilizer, after implementing it to the laboratory model, is investigated. The results of real-time implementation prove that the proposed PSS offers a superior performance in comparison with the conventional stabilizer.