

Optimal Design Of Power-System Stabilizers Using Particle Swarm Optimization

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Summary

In this paper, a novel evolutionary algorithm-based approach to optimal design of multimachine power-system stabilizers (PSSs) is proposed. The proposed approach employs a particle-swarm-optimization (PSO) technique to search for optimal settings of PSS parameters. Two eigenvalue-based objective functions to enhance system damping of electromechanical modes are considered. The robustness of the proposed approach to the initial guess is demonstrated. The performance of the proposed PSO-based PSS (PSOPSS) under different disturbances, loading conditions, and system configurations is tested and examined for different multimachine power systems. Eigenvalue analysis and nonlinear simulation results show the effectiveness of the proposed PSOPSSs to damp out the local and interarea modes of oscillations and work effectively over a wide range of loading conditions and system configurations. In addition, the potential and superiority of the proposed approach over the conventional approaches is demonstrated.

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