

Robust Design Of Multimachine Power System Stabilisers Using Tabusearch Algorithm

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Summary

Robust design of multimachine power system stabilisers (PSSs) using the tabu search (TS) optimisation technique is presented. The proposed approach employs TS for optimal parameter settings of a widely used conventional fixed-structure lead-lag PSS (CPSS). The parameters of the proposed stabilisers are selected using TS in order to shift the system poorly damped electromechanical modes at several loading conditions and system configurations simultaneously to a prescribed zone in the left hand side of the s-plane. Incorporation of TS as a derivative-free optimisation technique in PSS design significantly reduces the computational burden. In addition, the quality of the optimal solution does not rely on the initial guess. The performance of the proposed PSSs under different disturbances and loading conditions is investigated for multimachine power systems. The eigenvalue analysis and the nonlinear simulation results show the effectiveness of the proposed PSSs in damping out the local, as well as the interarea, modes and enhance greatly the system stability over a wide range of loading conditions and system configurations

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