Enhanced PID Controller for Load Frequency Regulation in Power Systems Using PSO and GA Algorithms

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Abstract:

This study examines the effect of the improved controller on the load frequency control (LFC) issue. The proportional-integral-derivative (PID) parameters are calculated for a single-area control system utilizing genetic algorithms (GA) and particle swarm optimization (PSO). The LFC is a stochastic issue resulting from load fluctuations and alterations in system operating conditions. This leads to the conventional controller's inability to modify the Load Frequency Control when employing a traditional PID.To implement optimal PID controller parameters with Genetic Algorithms and Particle Swarm Optimization. The findings demonstrate the precision and resilience of executing the optimized controller parameters. The proposed optimized controller has superior control quality compared to the standard controller. MATLAB/Simulink is employed to resolve the system equations. The proposed optimized controller demonstrates rapid reaction and superior control quality compared to the standard controller.