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Economic Dispatch with Line Flow Constraints Using Hybrid PSO and IPSO Techniques

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Abstract

This paper presents an Improved Particle Swarm Optimization (IPSO) to solve the Economic Dispatch (ED) problem with line flow constraints, bus voltage limits and generator operating constraints. In the proposed IPSO method, a new velocity strategy equation is formulated suitable for large scale system and the features of the Constriction Factor Approach (CFA) are also incorporated into the proposed approach. Different evolutionary programming (EP) techniques such as Classical EP (CEP), Fast-EP (FEP) and Mean of Classical and Fast EP (MFEP) have different features and their combination with PSO may become more effective to find the optimal solution. Combining the advantages of CEP, FEP and MFEP in the PSO method called hybrid PSO. The proposed approach compares the results obtained from hybrid PSO, Conventional Particle Swarm Optimization (PSO), Evolutionary Programming (EP) techniques such as CEP, FEP and MFEP. In this paper, the proposed IPSO, hybrid PSO, PSO and EP techniques such as CEP, FEP, MFEP methods have been tested on IEEE-14, 30, 118-bus and also on 66-bus Indian utility system. Results show that the proposed method is very competent in solving ED problem in comparison with other existing methods.

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