Abstract

This paper proposes GENCOs' profit maximization using Binary Artificial Bee Colony Optimization based on global best parameters (GbBABC). The optimal rival bidding strategy is employed to maximize GENCOs' profit. Monte Carlo (MC) simulation has been used to predict the bidding behavior of the rivals. In this paper, a bi-level optimization problem has been proposed to obtain the optimal bidding strategy of a supplier in which lower level problem represents the market clearing process of the system operator (SO) and the upper level optimization problem represents the supplier's profit maximization function, which is a non-linear function. In the proposed algorithm, global best parameter was incorporated into BABC algorithm, which makes the exploitation capacity improved and convergence speed quickened. At the same time, in order to maintain the population diversity the bit mutation operator is also performed. The feasibility of the proposed approach is analyzed on IEEE 30-bus system and IEEE-57 bus system. Results obtained using the GbBABC algorithm have been compared with those obtained using standard Artificial Bee Colony (ABC) optimization, global best guided ABC (GbABC) and global best distance guided ABC (GbdABC).
Binary Artificial Bee Colony Optimization for GENCOs’ Profit Maximization under Pool Electricity Market


Index Terms

Computer Science

Artificial Intelligence

Keywords

GENCOs’ profit maximization; optimal bidding strategy; Market Clearing Price; Binary Artificial Bee Colony Optimization; Artificial Bee Colony Optimization.