Using the barnacles mating optimizer with effective constraints handling technique for cost minimization of optimal power flow solution

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ABSTRACT

Optimal Power Flow (OPF) solution is one of the active research topics in power system optimization problems. It is one of the complex non-linear optimization problems where the determination of economical and efficient operation should be done by obtaining the steady state of electrical components in power networks. Various metaheuristic algorithms have been utilized in the last decades to solve OPF. However, the constraints of OPF are normally solved by implementing the penalty function approach which require tedious trial and error to obtain the penalty function's selection. This paper proposes the constraint handling technique namely superiority of feasible solution (SF) that integrated with the recent metaheuristic algorithm, viz. Barnacles Mating Optimize (BMO) to be implemented of OPF problem, specifically in cost minimization. The approach is tested on IEEE 30-bus system and compared with the other metaheuristic algorithm with SF approach too. From the comparison, it can be concluded that the performance of SF-BMO is better compared to others in terms of obtaining the minimum cost of power generation.