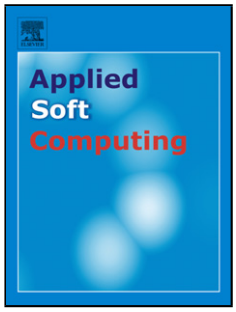

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Multi-objective Backtracking Search Algorithm for Economic Emission Dispatch Problem

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ABSTRACT—This paper presents the application of backtracking search algorithm (BSA) for solving an economic/emission dispatch (EED) problem as a multi-objective optimization problem. BSA is a newly developed evolutionary algorithm with one control parameter to solve numerical optimization problems. It utilizes crossover and mutation operators to advance optimization towards the optimal. The multi-objective BSA developed and presented in this paper uses an elitist external archive to store non-dominated solutions known as pareto front. The problem of EED is also solved by weighted sum method, which combines both objectives of the problem into a single objective. Three test systems are the case studies verifying the effectiveness of BSA. The results are compared with those of other methods in literatures and confirm the high performance of BSA.

Keywords— environmental concerns, economic dispatch, non-convex, transmission loss, backtracking search algorithm (BSA).