

A two phase local global search algorithm using new global search strategy

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Abstract

In this paper, we present a two phase local global search algorithm that is used to remedy the problems associated to the presence of sensitive local optima. However, The presence of such optima in most optimization problems make the global optimization very difficult in the sense that, as soon as the design space exhibits such local optima, the optimization method falls inside and are unable to leave it to a potentially better region. To accurate this problem we propose a new global search technique, which is called *Circular Design*. We propose also a new point scattering design and a new population evolution scheme the new algorithm works on the principal of evaluating a set of super individuals only. The local search is invoked at each time where a reallocation of the center of the Circular Design is needed, and it has the ability of significantly enlarge the attraction basin of the global optimum in order to reduce the probability of a possible convergence to an interesting local optimum. To illustrate the effectiveness of the proposed algorithm, numerical applications are performed with different benchmark problems; and the obtained results are satisfactory in terms of the solution quality and the time need to reach the global optimum.

Keywords : Space partition, basins of attraction, circular design, local search, region potential.

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