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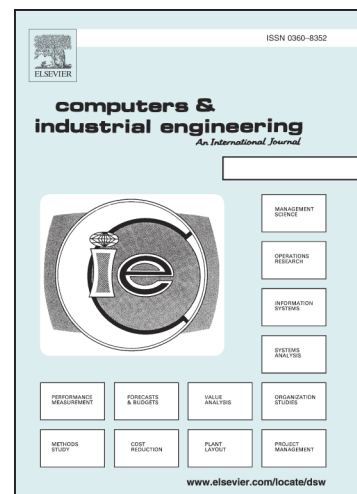
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Adaptive Biased Random-key Genetic Algorithm with Local Search for the Capacitated Centered Clustering Problem

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Abstract

This paper proposes an adaptive Biased Random-key Genetic Algorithm (A-BRKGA), a new method with on-line parameter control for combinatorial optimization problems. A-BRKGA has only one problem-dependent component, the decoder and all other parts can be reused. To control diversification and intensification, a novel adaptive strategy for parameter tuning is introduced. This strategy is based on deterministic rules and self-adaptive schemes. For exploitation of specific regions of the solution space we propose a local search in promising communities. The proposed method is evaluated on the Capacitated Centered Clustering Problem (CCCP), which is an NP-hard problem where a set of n points, each having a given demand, is partitioned into m clusters each with a given capacity. The objective is to minimize the sum of the Euclidean distances between the points and their geometric cluster centroids. Computational results show that the A-BRKGA with local search is competitive with other methods of literature.

Keywords: Parameter control, Genetic Algorithm, Random-keys, Local search.

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