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求解大规模系统可靠性问题的修正和声搜索算法

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Modified harmony search algorithm for solving large scale system reliability problem

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摘要　　　　　图/表　　　参考文献(19)　　相关文章 (15)

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摘要

针对大规模系统可靠性问题，提出一种修正和声搜索(MHS) 算法. 该算法修改了和声搜索(HS) 算法的搜索机制, 以当前最优解为研究对象, 随机选取不同维数进行即兴创作, 并修正步长(BW) 的调整方式, 均衡算法的全局搜索和局部搜索. 对经典的大规模系统可靠性问题进行求解, 数值结果表明, 所提出算法优于其他文献中的6 种和声搜索算法. 与最近提出的求解此类问题的各种算法进行实验对比, 实验结果表明所提出算法在整体上具有良好的优化性能.

关键词 : 系统可靠性, 和声搜索算法, 探索能力, 优化

Abstract :

A modified harmony search(MHS) algorithm is proposed for solving large-scale system reliability problem. This algorithm amends the searching mechanism of HS algorithm, which takes the best-so-far solution as a study subject, randomly selects different dimensions to conduct improvisation, and modifies the adjustment method of parameter bandwidth(BW) to balance global and local searching. The classical large-scale system reliability problem is solved. Numerical results show that the proposed MHS algorithm is better than all the reported 6 kinds of HS algorithms. The MHS algorithm has better optimization performance on the whole compared to some excellent algorithms reported for solving large-scale system reliability problems in the recent year.

Key words : system reliability　harmony search algorithm　exploration ability　optimization

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