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研究、探讨

基于小波阈值收缩消噪的浮点数编码遗传算法研究

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摘要 浮点数编码具有精度高、便于高维大空间搜索的优点，在函数优化和约束优化领域明显有效于其他编码。但浮点数编码遗传算法在运行环境中产生的噪音对算法性能的影响并未引起人们的重视。传统的浮点数编码遗传算法采用的是有界随机变异，不能消除噪音对算法性能的影响。提出了基于小波阈值收缩消噪的浮点数编码遗传算法，建立滤波器，采用不同的阈值消噪取代变异操作，并进行了实验。该研究和实验结果表明，这种方法理论上是可靠的，方法上是可行的，选择适当的阈值，可明显提高算法的全局最优解精度，具有较高的稳定性。

关键词 遗传算法 小波阈值 收缩消噪 变异

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Research on floating point representation genetic algorithm based on wavelet threshold shrinkage denoising

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Abstract

Floating Point Representation（FPR） is of the strongpoint of high precision and facilitating search on high-dimension space.It is superior to other representation in function optimization and restriction optimization.But，the noise in run environment has brought about with Floating Point Representation Genetic Algorithm（FPRGA）.It has often neglected by researchers.Simple FPRGA uses bounded random mutation.It cannot avoid the noise to influence on the algorithm performance.This paper presents the Floating point representation Genetic Algorithm based on Wavelet threshold Shrinkage Denoising（FGAWSD）.A filter is structured.Mutation operation is replaced with different thresholds denoising.The experiments are done.The result of the research and the experiments indicates that the method is reliable in theory，is feasible in technique.The precision of optimal solution of the algorithm can be enhanced by selecting proper threshold.The method is of high stability.

Key words genetic algorithm wavelet threshold shrinkage denoising mutation

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