研究、探讨

一类非凸优化问题的遗传算法

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摘要　　线性二层规划是一类特殊的非凸优化问题，为了有效求解该问题，提出了一种基于单纯形方法的遗传算法。首先基于下层约束给出了一种新的编码方法；其次利用单纯形表的信息得到了下层问题的解函数，并结合最优性条件给出了适应度函数；最后基于个体编码的特点，设计了新的遗传算子。数值结果表明，所提出的算法是可行有效的。
关键词　　非凸优化问题　线性二层规划　遗传算法　单纯形方法　最优解
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Genetic algorithm for a class of nonconvex optimization problems

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Abstract

Linear bilevel programming problem is a special class of non-convex optimization problems，in order to solve the problems efficiently，a new genetic algorithm based on the simplex method is proposed.At first，a novel encoding scheme is designed based on the lower-level constraints.Then，the solutions to the lower-level problem，as functions of upper-level variables，are got by using the information in the simplex tableau，and a new fitness is given by combining these solution functions with optimality conditions.At last，new genetic operators are designed according to the characteristics of individuals.The numerical results illustrate that the proposed algorithm is feasible and efficient.

Key words　nonconvex optimization problems　linear bilevel programming　genetic algorithm　simplex method　optimal solutions

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