

过程系统工程

基于向量评价遗传算法的化工园区无约束双目标安全规划

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摘要

应用多目标优化的理论建立了一个适用于化工园区的无约束双目标安全规划模型,两个目标分别为潜在死亡人数最小化和总收益最大化,并基于向量评价遗传算法(VEGA)设计和实现了模型的优化过程。研究得出的结论为:(1)提出的模型和优化方法是可行的,能够搜索出部分Pareto最优解,它们对化工园区安全规划具有很好的参考价值。(2)使用的编解码方法简便直观,避免了计算染色体函数值时二进制和实数之间的转换问题,有利于算法的设计和实现。(3)在VEGA算法末尾引入的非劣剔除算子有助于从最终解中快速剥离出Pareto最优解。(4)VEGA算法搜索能力尚显不足,有必要研究性能更好的算法。

关键词

[向量评价遗传算法](#) [无约束双目标优化](#) [化工园区](#) [安全规划](#)

分类号

No-constraint two-objective land-use planning of chemical industry park based-on VEGA

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Abstract

A model of no-constraint two-objective land-use planning for chemical industry park was constructed by applying the theory of multi-objective optimization, and the two objectives were the minimum potential loss of life (PLL) and the maximum total benefit. The optimization process of the model was designed and realized based on vector evaluated genetic algorithm (VEGA). Some conclusions were made from this study: (1) The model and optimization method proposed in this paper were feasible and a part of Pareto-optimal solutions could be found and they had good reference values for land-use planning of chemical industry park. (2) The mode of coding and decoding in this paper was simple and intuitive and the transform problem between binary system and real number was avoided when the function values of chromosomes were calculated and they were propitious to designing and realizing the algorithm. (3) The non-dominated elimination operator introduced at the end of VEGA could help to peel off Pareto-optimal solutions from final solutions speedily. (4) The search power of VEGA was insufficient for this model and it was necessary to try using better algorithms.

Key words

[vector evaluated genetic algorithm](#) [no-constraint two-objective optimization](#) [chemical industry park land-use planning](#)

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