

控制与决策 › 2015, Vol. 30 › Issue (07): 1153-1161 DOI: 10.13195/j.kzyjc.2014.0645

论文

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基于CP-nets 的偏好感知交互式遗传算法及其个性化搜索

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Interactive genetic algorithm with CP-nets preference surrogate and application in personalized search

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摘要

针对用户显式评价导致用户疲劳, 进而限制交互式遗传算法搜索性能的问题, 研究基于用户交互行为和条件偏好网络(CP-nets) 的隐式评价模式的交互式遗传算法, 并将其应用于图书商品个性化搜索. 首先, 给出用户交互行为的数学描述, 建立基于用户少量交互行为的条件偏好网络模型以拟合用户偏好; 然后, 利用CP-nets 模型估计用户对进化个体的评价价值, 实施进化操作以帮助用户尽快找到满意解. 在个性化搜索中的应用验证了所提出算法的有效性.

关键词 : 交互式遗传算法, 偏好感知, 条件偏好网络, 个性化搜索

Abstract :

The explicit evaluation mode of interactive genetic algorithms (IGAs) often brings user fatigue, which greatly limits the performance of IGAs in exploration. Therefore, an IGA with an implicit evaluation mode is proposed based on the interactive actions performed by the user and the conditional preference nets (CP-nets). Firstly, the model of those possible actions is built, and the CP-nets adopted to approximate to the preference of the user are constructed according to few interactive actions. Then, the CP-nets model is adopted to estimate the assignments of those individuals not evaluated by the user, and the evolution process is successfully conducted based on the estimated fitness to assist the user finding his/her interested solution as early as possible. The proposed algorithm is applied to a personalized search for books, and the results show the effectiveness of the proposed algorithm.

Key words : interactive genetic algorithms preference cognition CP-nets personalized search

收稿日期: 2014-04-29 出版日期: 2015-06-22

ZTFLH: TP273

基金资助:

中央高校基本科研业务费基金项目(2012QNA58); 国家自然科学基金项目(61105063, 61473298).

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引用本文:

孙晓燕 陆宜娜 巩敦卫 张抗抗. 基于CP-nets 的偏好感知交互式遗传算法及其个性化搜索[J]. 控制与决策, 2015, 30(07): 1153-1161. SUN Xiao-yan LU Yi-na GONG Dun-wei ZHANG Kang-kang. Interactive genetic algorithm with CP-nets preference surrogate and application in personalized search. Control and Decision, 2015, 30(07): 1153-1161.

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