

模块化产品优化配置问题的混合PSO求解方法

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关键词: 产品优化配置 客户需求 模块化 混合粒子群算法

摘要: 针对产品优化配置问题,建立了客户需求与可配置产品模块实例之间的映射关系,采用动态惩罚函数处理约束条件,构建了产品优化配置问题的数学模型。采用遗传算法的交叉与变异策略和模拟退火算法的Metropolis准则改进粒子群算法,将形成的混合粒子群算法作为产品优化配置的求解方法。使用二进制编码方案表示可配置产品的配置方案。通过使用混合粒子群算法进行产品优化配置仿真试验,以及混合粒子群算法与遗传算法的仿真对比试验,证明该方法简单有效,效率较高。The relationship between customer demand and the modular instances of configurable product was established to solve the product configuration optimization problem. Constrained terms were processed by the dynamic penalty function and the mathematical model was built. The basic PSO algorithm was improved by using crossover and mutation strategy of genetic algorithm and Metropolis rule of simulated annealing algorithm. The hybrid PSO algorithm was used to solve modular product configuration optimization, and the binary encoding scheme was adopted to express the configurable product cases. Finally, a simulation comparison of product configuration optimization was carried out by the hybrid PSO and genetic algorithm respectively. The results show that the hybrid PSO algorithm is simple and effective.

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