

过程系统工程

基于Kriging代理模型的气辅注射成型工艺优化

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摘要

针对气辅成型工艺设定及控制的复杂性, 使用Kriging代理模型近似拟合气辅成型工艺参数与气体穿透长度之间的非线性函数关系, 建立起Kriging代理模型与APSO算法相结合的优化策略。应用所建立的优化方案, 以气体的穿透深度为优化的目标, 模拟了某汽车后视镜的气辅成型工艺优化过程。算例表明, 基于Kriging代理模型与APSO算法耦合的优化策略可以在小样本情况下获取较高的求解精度和较快的收敛速度。

关键词

[GAIM](#) [优化](#) [Kriging代理模型](#) [APSO算法](#)

分类号

Processing parameters optimization based on Kriging metamodel for gas-assisted injection molding

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Abstract

For the gas-assisted injection molding process, it is hard to find the explicit relationship between the depth of gas penetration and processing parameters. In this paper, an optimization strategy based on Kriging metamodel and adaptive particle swarm optimization (APSO) algorithm was developed. The Kriging metamodel was adopted to approximate the nonlinear relationship between processing parameters and the depth of gas penetration, and the APSO algorithm was adopted to carry out the optimization procedure. Moreover, such strategy was used for the parameter optimization of a real auto rear view mirror, in which the depth of gas penetration was set as the optimization objective. It was shown that the presented optimization strategy based on Kriging metamodel and APSO algorithm could achieve higher solving accuracy and fast convergence rate for those small sample size problems.

Key words

[GAIM](#) [optimization process](#) [Kriging metamodel](#) [APSO algorithm](#)

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