

短文

## 关键路径与随机串行生产线的灵敏度分析

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摘要

扰动分析是研究离散事件动态系统的有效方法,性能函数的可微性是应用该方法的前提条件之一.利用关键路径的概念,证明了随机串行生产线稳态性能函数可微的充要条件为系统的关键路径以概率1唯一;而且,当系统的关键路径以正概率不唯一时性能函数的方向导数存在,进而给出了其方向导数的无偏估计量.最后指出应用扰动分析和非光滑分析方法研究这类性能函数不可微系统的思路.

关键词 [随机串行生产线](#) [关键路径](#) [不可微性](#)

分类号

## Critical Path and Sensitivity Analysis of Stochastic Serial Production Lines

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Abstract

Perturbation analysis is an efficient method to study DEDS, which requires the differentiability of the performance function. In this paper, by using the notion of critical path, it is first proved that the steady-state performance function of a stochastic serial production line is differentiable iff its critical path is unique w. p. 1. Moreover, it is shown that in the case of the critical path being not unique with positive probability, the one-sided derivatives of the performance function exist and their unbiased estimators are given. Finally, the method of parameters optimization of DEDS via perturbation analysis and nonsmooth optimization is outlined.

Key words [Stochastic serial production line](#) [critical path](#) [nondifferentiability](#)

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