

论文与报告

Markov离散事件动态系统参数灵敏度估计算法

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摘要

给出了马尔可夫离散事件系统参数灵敏度估计的高效率仿真算法.既可以用于稳态性能测度的参数灵敏度估计,也可用于终止型性能测度的灵敏度估计.和现有的仿真算法相比,其数学描述和仿真流程比较简洁,易于编程实现.给出的各种仿真算例均验证了该方法的适用性.此外,还指出了马尔可夫系统性能测度参数灵敏度的精确估计为光滑扰动分析(Smoothed Perturbation Analysis)和似然比方法(Likelihood Ratios)得到的估计量之和,单独使用其中的任何一种均难以给出系统性能测度参数灵敏度的可靠、一致估计.

关键词 [马尔可夫系统](#) [灵敏度估计](#) [性能测度](#) [仿真](#)

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Algorithm for Performance Sensitivity Estimation of Markov Discrete Event Dynamic System

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Abstract

An efficient simulation algorithm for performance sensitivity estimation of Markov discrete event dynamic system is designed. This algorithm can give consistent and reliable results for both steady state and transient performance sensitivity estimation. Compared with other simulation based sensitivity estimation methods, the proposed algorithm is simple in mathematical description and is easy in program realization. The capability of this algorithm is illustrated with several examples. Furthermore, our research shows that performance sensitivity of Markov discrete event dynamic system is the sum of the estimation obtained from both smoothed perturbation analysis (SPA) and likelihood ratios method (LR), singly using any one of them usually can not give consistent and reliable result.

Key words [Markov system](#) [sensitivity evaluation](#) [performance measure](#) [simulation](#)

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