Bayesian Estimation of Traffic Intensity Based on Queue Length in a Multi-server $M/M/s$ Queue *

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Abstract

In this paper, we focus on multi-server queueing systems in which inter-arrival and service times are exponentially distributed (Markovian). We use a Bayesian technique, the sampling/importance resampling method (SIR), to estimate the parameters of these queueing systems, making possible the determination of performance measures that are essential to the evaluation of important practical applications such as computer and telecommunication networks, manufacturing and service systems, health care, and other similar real-life problems. Extensive numerical results are presented to demonstrate the accuracy and efficiency of the technique, as well as some of its limitations.

Keywords: Markovian queues, multi-server, Bayesian inference, predictive distribution.

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