Performance Measure Estimations in Erlang Single Server Queues [*]

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Abstract

Queing systems with Markovian arrivals, Erlangian service times, and single servers are the focus of this article, that is, $M/E_r/1$ queues, in Kendall notation. Statistical methods are proposed to estimate important parameters in such queues which are based on finite samples of the number of customers who arrived during the service periods. Complementary methods are proposed on the line of the classical maximum likelihood and of the Bayesian methods, which are based on flexible prior distributions. Extensive Monte Carlo tests are presented, showing the effectiveness and efficiency of the proposed methods.

Keywords: $M/E_r/1$ queue, MLE, Bayesian inference, performance measures.