Novel Sampling Strategy for Inference in $M/M/1$ Queues *

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Abstract

We address the estimation of performance measures in single-server Markovian queueing systems by introducing a novel sampling scheme based on the number of departures that occur during the interarrival time of a customer. This approach is more efficient, as it enables the sequential collection of samples in a stochastic process that exhibit strong correlation. We provide a description of this model and apply it to classical and Bayesian estimation of key performance measures.

Keywords: Queueing; $M/M/1$; queue; maximum likelihood estimation; Bayesian inference.