ARRIVAL PROCESS MODELING IN GI[X]/M/C/K QUEUEING SYSTEMS

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ABSTRACT

The idea of incorporating statistical estimation into the analysis of queueing systems is interesting and this is a potentially important emerging area. This paper considers an empirical analysis of a queueing system when the arrival process follows a general distribution. The inter-arrival distribution is estimated by a kernel density estimation method and then this is used to evaluate some performance measures. The queueing model of interest is *GI[X]/M/c/N*, which in Kendall notation stands for a general arrival distribution *GI*, with group sizes *X*, exponentially distributed service times *M*, with *c* servers in parallel, and a total capacity *N* including the items in service. The contribution of this paper is to explore the idea of incorporating a kernel approach to evaluating queueing systems with a general arrival distribution. The paper discusses some results on standard kernel density estimation and also provides some simulation results.

KEYWORDS: Statistics, queueing systems, kernel estimator, performance evaluation.