

BAYESIAN ANALYSIS OF THE $MAP_2/G/1$ QUEUEING SYSTEM

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The second-order Markovian arrival process or MAP_2 , has been recently proposed as a versatile model for arrival traffic which allows for dependent arrivals. However, the basic MAP_2 model is not identifiable which leads to problems from an inferential viewpoint. Here, we use a recently developed, identifiable representation of the MAP_2 as the basis for an algorithm which allows us to undertake Bayesian inference for the MAP_2 arrival process. We use our approach to estimate the queue length and virtual waiting time distributions of a stationary $MAP_2/G/1$ queueing system, which is a generalization of the $M/G/1$ system that allows for dependent inter-arrival times. Our procedure is illustrated with applications in internet traffic analysis.