

# Variance Reductions in Simulation of a State-Dependent Queueing System Using Total Hazard

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## ABSTRACT

A queueing system is considered where customers arrive according to a Poisson process. Each customer possesses a random workload which is processed by a single server using a state-dependent rate. Total hazards are derived and utilized as control variates for reducing the variance of the raw simulation estimator of the expected number of customers during a busy period. Other control variates are also considered and their performances are compared.