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Quantitative
Modeling
In
Parallel
Systems

Polling Models with and without Switchover Times

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Abstract We consider two different single-server cyclic polling models: (i) a model with zero switchover times, and (ii) a model with non-zero switchover times, in which the server keeps cycling when the system is empty. For both models we relate the steady-state queue length distribution at a queue to the queue length distributions at server visit beginning and visit completion instants at that queue; as a by-product we obtain a short proof of the Fuhrmann-Cooper decomposition. For the large class of polling systems that allow multitype branching process interpretation, we expose a strong relation between the queue length, as well as waiting-time, distributions in the two models. The results enable a very efficient numerical computation of the waiting-time moments j under different switchover time scenarios.

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