ANALYSIS OF FINITE OSCILLATING $GI^X/M(m)//N$ QUEUEING SYSTEMS

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Abstract:

In this work we investigate oscillating $GI^X/M(m)//N$ systems, which are queueing systems whose service mechanism reacts to the congestion of the system; namely, the service rates oscillate between two forms according to the evolution of the number of customers in the system. Resorting to Markov chain embedding, we address the time-dependent and limit analysis of the number of customers in the system at batch prearrivals and seen by customers at their arrival to the system. These results are then used to derive the continuous-time limit distribution of the number of customers in the system. In addition, we provide some numerical examples that illustrate our approach.

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