

**Yang, Tao; Posner, Morton J. M.; Templeton, James G. C.**

**The  $C_a/M/s/m$  retrial queue: A computational approach.** (English) Zbl 0761.90046  
ORSA J. Comput. 4, No. 2, 182-191 (1992).

**Summary:** This paper considers a service station consisting of  $s$  identical, independent exponential servers and  $m$  buffers. Customers arrive according to a Coxian process with  $a$  stages. Blocked customers may either leave the system forever or return, after an exponentially distributed amount of time, to the service station to retry for services. An efficient algorithm is developed to evaluate system steady-state probabilities, and formulas for certain system performance measures are derived in terms of the steady-state probabilities. The computational complexity of the algorithm is shown to be  $O(4N)$ , where  $N$  is the total number of state probabilities evaluated. The influence of the form of interarrival time distributions on system performance measures is examined through numerical results. Issues concerning numerical stability of the algorithm are also discussed.

**MSC:**

- 90B22 Queues and service in operations research
- 60K25 Queueing theory (aspects of probability theory)
- 90C60 Abstract computational complexity for mathematical programming problems
- 90-08 Computational methods for problems pertaining to operations research and mathematical programming

**Keywords:**

service station; identical, independent exponential servers; buffers; Coxian process; system performance measures

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