

QUEUEING NETWORKS FOR MANUFACTURING SYSTEMS

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ABSTRACT

Queueing networks with finite buffers have been widely used for modeling and analyzing many practical situation such as manufacturing systems, computer and communication systems. A complex manufacturing system usually consists of one or more complex operations, such as assembly, disassembly, split, merge, rework, parallel, feedforward and scrap, etc.. Many approximation methods are presented for analysis of queueing networks with finite buffer. One of the most common methods is decomposition method which decomposes the long line into subsystems that are mathematically tractable, and the original system is analyzed by using the results of subsystems. One of the most important ingredients in decomposition method is to model and analyze the subsystem that reflects the dependence among the nodes in the network. In this talk, we present an approximation method for the two-stage queueing networks with merge configuration and split configuration in which each node has multiple servers and finite buffer. The results can be applied to analyze the complex queueing network with merge and split configuration.