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QMIPS

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Quantitative
Modeling
In
Parallel
Systems

Heterogeneous Multiprocessor Systems with Breakdowns: Performance and Optimal Repair Strategies

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Abstract A model of a system with N parallel processors subject to occasional interruptions of service, and a common unbounded queue fed by a Poisson arrival stream, is analyzed in the steady state. The service, breakdown and repair characteristics may vary from processor to processor. A solution method called *spectral expansion* is used to determine the joint distribution of the state of the processors and the number of jobs in the queue. The problem of optimizing the repair policy is addressed. The optimal policy is determined in the case where all breakdown rates are equal, and some heuristics for the general case are investigated.

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