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A new approach to the mean residual lifetime (MRL) stochastic modeling of a parallel system

Through incorporating a bivariate state process, this paper explores an approach to the stochastic modeling of MRL for a failure-prone parallel system operating in a random environment. The bivariate state-dependent MRL (BSDMRL) model outperforms the ordinary MRL and other state-dependent MRL models in the actual circumstance that it incorporates not only the age factor, but also two basic processes: the number of failed components and the operating environment. Such mature model helps in two ways: (i) the correct evaluation of the system state; (ii) accurate decision-making by the use of the BSDMRL as a decision variable.

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