

عنوان مقاله:

Bayesian Inference of Reliability Growth-Oriented Weibull Distribution for Multiple Mechanical Stages Systems

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خلاصه مقاله:

The Duane and Crow-AMSAA reliability growth model has been traditionally used to model systems and products undergoing development testing. The Non-Homogeneous Poisson Process (NHPP) with a power intensity law has been often used as a model for describing the failure pattern of the repairable systems and the maximum likelihood (ML) estimates are used to calculate the unknown parameters widely. This study proposes the statistical analysis method of different stages and different level data based on Bayes analysis techniques. To this end, the Bayesian reliability growth model of multiple stages is coupled with the Weibull distribution product. By using the unique properties of the assumed prior distributions, the moments of the posterior distribution of the failure rate at various stages during a development test can be found. In this paper, it is assumed that the scale parameter has a Gamma prior density function, and the growth parameter has a Uniform prior distribution. Monte Carlo simulations are used to compute the Bayes estimates. Finally, the results obtained from the proposed method by implementing it on an application example are compared with Crow-AMSAA data and show that the proposed model has higher accuracy than the existing traditional methods.

کلمات کلیدی:

reliability growth, Non-homogeneous Poisson process (NHPP), Bayes Analysis, Weibull distribution, Monte Carlo

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