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Estimation in a discrete reliability growth model under an inverse sampling scheme. (English)

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[Ann. Inst. Stat. Math.](#) 49, No. 2, 211-229 (1997).

Summary: This paper develops a discrete reliability growth (RG) model for an inverse sampling scheme, e.g., for destructive tests of expensive single-shot operations systems where design changes are made only and immediately after the occurrence of failures. For q_i , the probability of failure at the i -th stage, a specific parametric form is chosen which conforms to the concept of the *J. T. Duane* [IEEE Trans. Aerospace Electron. Syst. 2, 563-566 (1964)] learning curve in the continuous-time RG setting. A generalized linear model approach is pursued which efficiently handles a certain non-standard situation arising in the study of large-sample properties of the maximum likelihood estimators (MLEs) of the parameters. Alternative closed-form estimators of the model parameters are proposed and compared with the MLEs through asymptotic efficiency as well as small and moderate sample size simulation studies.

MSC:

[62N05](#) Reliability and life testing
[62F12](#) Asymptotic properties of parametric estimators
[62J12](#) Generalized linear models (logistic models)

Cited in **2** Documents

Keywords:

[asymptotics](#); [nonhomogeneous geometric](#); [discrete reliability growth](#); [inverse sampling](#); [maximum likelihood estimators](#)

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