

Optimal tests in sequential order statistics

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Abstract

The lifelength of a sequential k -out-of- n system, i.e. a system that fails if $n - k + 1$ or more components fail where after the failure of a component the residual lifelength of the remaining components may change, is represented by the corresponding sequential order statistics.

We consider sequential order statistics based on the distribution functions $F_i = 1 - (1 - F)^{\alpha_i}$, $1 \leq i \leq n$, with an underlying absolutely continuous distribution function F and model parameters $\alpha_1, \dots, \alpha_n$. In the well-examined case that F is known where the uncertainty in the model is captured only within the unknown model parameters $\alpha_1, \dots, \alpha_n$, we show that by a new approach many results in literature concerning statistical inference can be obtained an easier and more general way. We focus on optimal tests on the model parameters.