# Investigation of MLE in nonparametric estimation methods of reliability function

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Abstract

There have been lots of trials to estimate a reliability function. In the ESReDA 20th seminar, a new method in nonparametric way was proposed. The major point of that paper is how to use censored data efficiently.

Generally there are three kinds of approach to estimate a reliability function in nonparametric way, i.e., Reduced Sample Method, Actuarial Method and Product-Limit (PL) Method. The above three methods have some limits. So we suggest an advanced method that reflects censored information more efficiently.

In many instances there will be a unique maximum likelihood estimator (MLE) of an unknown parameter, and often it may be obtained by the process of differentiation. It is well known that the three methods generally used to estimate a reliability function in nonparametric way have maximum likelihood estimators that are uniquely exist. So, MLE of the new method is derived in this study. The procedure to calculate a MLE is similar just like that of PL-estimator. The difference of the two is that in the new method, the mass (or weight) of each point has an influence of the others but the mass in PL-estimator not.