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The lifetime model with two types of competing risks

In constructing of lifetime model of any technical system or any product, sometimes it can be viewed that traditionally used Weibull distribution is biased. In consequence, parameters estimation can be fatal. In such situation, it is not possible to find good fitting function which characterizes the lifetime. Here all possible risks of the considered product are divided on two types: so called accidental risks and aging risks. The accidental risk has exponential distribution, and aging risk has Weibull distribution. In this announcement, some mixed model of the lifetime with both types of risks is presented. A way to modeling is a simple competing risk distribution as a possible alternative to the Weibull distribution in lifetime analysis. This distribution corresponds to the minimum between family of exponential and family of Weibull distributions.

Our motivation is to take account of both, accidental and aging risks in lifetime data analysis. For introduced model, such functions as hazard function, survival function and density function will be given. Moreover, such characteristics as the expected value and the variance of a modeled lifetime will be considered. In the end, the decision problem of choosing between an exponential, Weibull and introduced competing risk model will be discussed.

References

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