A SURVEY OF SOME INFERENCE PROBLEMS FOR DEPENDENT SYSTEMS

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In this paper a survey of some inference problems relating to dependent systems are considered. A number of multivariate models, both parametric and nonparametric, are given and related tests of dependence and tests of exponentiality are considered.

1. Introduction. The univariate exponential distribution with density function

$$f(x) = \lambda \exp(-\lambda x), \quad x \geq 0, \ \lambda > 0$$

and distribution function

$$F(x) = 1 - \exp(-\lambda x), \quad x \geq 0$$

is well known as the most important model in reliability theory. Here the survival function is given by

$$\bar{F}(x) = 1 - F(x) = \exp(-\lambda x), \tag{1}$$

and the failure rate function

$$r(x) = f(x)/\bar{F}(x)$$

for $F(x) < 1$, is λ, a constant. A random variable X with survival function (1) will be denoted by $X \sim e(\lambda)$.

The exponential distribution has a number of interesting properties. Some of these are given below.

P1. $F(x)$ is absolutely continuous.

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