

Siriporn Aorachon 2009: Generalized Lognormal Distribution and Its Application in Statistical Reliability. Master of Science (Statistics), Major Field: Statistics, Department of Statistics. Thesis Advisor: Assistant Professor Winai Bodhisuwan, Ph.D. 121 pages.

The purpose of this research is to study of generalized lognormal distribution, which is transformed from normal distribution. Basic studies are done based on some probability properties, e.g., moments, mean, variance, coefficient of skewness, coefficient of kurtosis, order statistics and graphs of distribution. Parameter estimation of the model is using maximum likelihood estimate. Some goodness of fit tests of generalized lognormal distribution such as Anderson Darling and Kolmogorov Smirnov have presented. The reliability analysis for generalized lognormal distribution is included. Some real data sets will be presented in this work. The results of the study show that the generalized lognormal distribution is skewed to the right when $0 < \lambda \leq 1$ and $\lambda < 0$, skewed to the left when $\lambda > 1$, when $\lambda = 1$ it is a special case of the normal distribution, furthermore it is lognormal distribution when $\lambda = 0$. The hazard function of generalized lognormal may be classified in 4 cases, e.g., 1) case $\lambda \geq 1$, the generalized lognormal distribution has an increasing hazard rate, 2) $\frac{1}{2} \leq \lambda < 1$, the hazard rate tends to infinity as time tends to 0, falling quickly, and then increasing, 3) $0 < \lambda < \frac{1}{2}$ hazard rate is decreasing at the beginning, and then increasing to a specific point of time, and decreases eventually to zero, 4) $\lambda < 0$, the generalized lognormal hazard rate starts at 0, increases to a specific point of time, and then decreases eventually to zero.

Student's signature

Thesis Advisor's signature

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