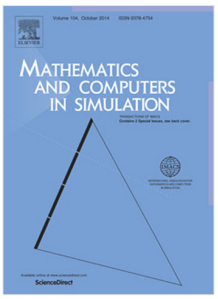
Accepted Manuscript



Adding a parameter to the exponential and Weibull distributions with applications

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PII: S0378-4754(17)30275-6
DOI: http://dx.doi.org/10.1016/j.matcom.2017.07.004
Reference: MATCOM 4479

To appear in: *Mathematics and Computers in Simulation*

Received date : 1 March 2013
Revised date : 13 November 2013
Accepted date : 17 July 2017

Please cite this article as: E. Gómez Déniz, Adding a parameter to the exponential and Weibull distributions with applications, *Math. Comput. Simulation* (2017), http://dx.doi.org/10.1016/j.matcom.2017.07.004

Adding a parameter to the exponential and Weibull distributions with applications

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Abstract

A generalization of the exponential distribution is studied. This new distribution is the natural conjugate prior for the continuous Lindley distribution. Since this distribution belongs to the natural exponential family of distributions, it has sufficient fixed–dimension statistics for varying sample sizes, and a conjugate prior distribution exists. The result obtained is a generalization of the exponential distribution which is applied in credibility theory and in other settings. The properties of this distribution and a generalization of the two–parameter Weibull distribution obtained from it are also presented.

Keywords: Bayesian, Conjugate, Credibility, Entropy, Exponential and Weibull Distributions, Natural Exponential Family.

1. Introduction

In recent years many papers dealing with the continuous Lindley distribution ([21]) have appeared in the statistical literature. One of these was [9], which studied some properties of the discrete Poisson–Lindley distribution proposed in [25] and which was recently extended by [23]). Other papers in this respect include [15] and [12]. Moreover, [10] made an extensive study of some of its more important properties.

[☆]EGD was partially supported by ECO2009–14152 (MICINN, Spain). The author is indebted to the referees for helpful comments which, without doubt, helped to improve an earlier version of the paper.

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