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ORIGINAL ARTICLE

A New Distribution Based on a Mixture of Two Geometric Distributions

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Abstract
In this paper, a discrete counterpart of the new generalized exponential distribution has been derived, and its different distributional properties including generating functions, order statistics, reliability measure, index of dispersion, and entropy were obtained. The model parameters are estimated using MLE and Bayesian approach under two different loss functions. Simulation analyses are performed for the model parameter accuracy. At last, the performance of the proposed model is demonstrated by comparing it with some competing models on three real data sets to show the applicability and adaptability of the proposed model.

Keywords New generalized exponential distribution · Generating functions · Prior · Loss function

1 Introduction

In recent years, the need for more flexible and resilient discrete probability models increased enormously due to the necessity of better describing challenging patterns found in empirical count data. Some authors have made contributions in this field by creating discrete counterparts of common continuous distributions. Some of the first and most seminal work includes Nakagawa and Osaki [15], who established the discrete Weibull distribution, setting the stage for later work in this area. Building upon their efforts, subsequent researchers have contributed a wide array of discrete distributions tailored for diverse modelling scenarios. For example, Stein and Dattero [21], introduced another form of discrete Weibull distribution. Kemp [11], introduced characterization of discrete normal distribution. Szablowski [22], introduced discrete

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