

The Normal-Generalized Hyperbolic Secant Distribution: Properties and Applications

Authors : Hazem M. Al-Mofleh

Abstract : In this paper, a new four-parameter univariate continuous distribution called the Normal-Generalized Hyperbolic Secant Distribution (NGHS) is defined and studied. Some general and structural distributional properties are investigated and discussed, including: central and non-central n -th moments and incomplete moments, quantile and generating functions, hazard function, Rényi and Shannon entropies, shapes: skewed right, skewed left, and symmetric, modality regions: unimodal and bimodal, maximum likelihood (MLE) estimators for the parameters. Finally, two real data sets are used to demonstrate empirically its flexibility and prove the strength of the new distribution.

Keywords : bimodality, estimation, hazard function, moments, Shannon's entropy

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