Inusah, Seidu; **Kozubowski, Tomasz J.**

A discrete analogue of the Laplace distribution. (English) Zbl 1081.60011

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Summary: Following *A. W. Kemp* [ibid. 63, No. 2, 223–229 (1997; Zbl 0902.62020)] who defined a discrete analogue of the normal distribution, we derive a discrete version of the Laplace (double exponential) distribution. In contrast with the discrete normal case, here closed-form expressions are available for the probability density function, the distribution function, the characteristic function, the mean, and the variance. We show that this discrete distribution on integers shares many properties of the classical Laplace distribution on the real line, including unimodality, infinite divisibility, closure properties with respect to geometric compounding, and a maximum entropy property. We also discuss statistical issues of estimation under the discrete Laplace model.

MSC:

60E05 Probability distributions: general theory
60E07 Infinitely divisible distributions; stable distributions
62E10 Characterization and structure theory of statistical distributions
62F10 Point estimation
62F12 Asymptotic properties of parametric estimators

Keywords:

Discrete normal distribution; Double exponential distribution; Geometric infinite divisibility; Maximum entropy property; Maximum likelihood estimation

Full Text: DOI

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