Second order expansions for sample median with random sample size. (English) Zbl 07470640

Summary: In the paper, second-order Chebyshev-Edgeworth expansions are proved for the sample median when the sample size has negative binomial or discrete Pareto-like distributions. The limiting distributions of the scaled sample median depend not only on the sample size distribution but also on the chosen scaling factor. The limiting distributions are the generalized Laplace, the normal and the scaled Student distributions, depending on the random, non-random or mixed scaling factor. Second order Cornish-Fisher expansions are also derived and the negative moments of the random sample sizes are calculated.

MSC:
60E05 Probability distributions: general theory
60G50 Sums of independent random variables; random walks
62E17 Approximations to statistical distributions (nonasymptotic)
62H10 Multivariate distribution of statistics

Keywords:
sample median; samples with random sizes; second order expansions; Laplace distribution; Student’s $t$-distribution; negative binomial distribution; discrete Pareto distribution

Full Text: Link

References:
[14] Christoph, G. and Ulyanov, V. V. Second Order Expansions for High-Dimension Low-Sample-Size Data Statistics in Random


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