Arellano-Valle, Reinaldo B.; Contreras-Reyes, Javier E.; Genton, Marc G.
Shannon entropy and mutual information for multivariate skew-elliptical distributions.
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Summary: The entropy and mutual information index are important concepts developed by C.E. Shannon [Bell Syst. Tech. J. 27, 379–423, 623–656 (1948; Zbl 1154.94303)] in the context of information theory. They have been widely studied in the case of multivariate normal distributions. We first extend these tools to the full symmetric class of multivariate elliptical distributions and then to the more flexible families of multivariate skew-elliptical distributions. We study in detail the cases of the multivariate skew-normal and skew-t distributions. We implement our findings to the application of the optimal design of an ozone monitoring station network in Santiago de Chile.

MSC:
62B10 Statistical aspects of information-theoretic topics
94A17 Measures of information, entropy
62H05 Characterization and structure theory for multivariate probability distributions; copulas
62P12 Applications of statistics to environmental and related topics

Keywords:
elliptical distribution; information theory; optimal network design; skew-normal; skew-t

Software:

sn; R

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References: