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The Class of Multivariate Bernoulli Distributions with Given Identical Margins

Monday, 11 September 2023 12:00 (30 minutes)

The main contributions of the work (joint with P. Semeraro, Politecnico di Torino) are algorithms to sample from multivariate Bernoulli distributions and to determine the distributions and bounds of a wide class of indices and measures of probability mass functions. Probability mass functions of exchangeable Bernoulli distributions are points in a convex polytope, and we provide an analytical expression for the extremal points of this polytope. The more general class of multivariate Bernoulli distributions with identical marginal Bernoulli distributions with parameter p is also a convex polytope. However, finding its extremal points is a more challenging task. Our novel theoretical contribution is to use an algebraic approach to find a set of analytically available generators. We also solve the problem of finding the lower bound in the convex order of multivariate Bernoulli distributions with given margins, but with unspecified dependence structure.

Keywords

Multivariate Bernoulli Distributions; Convex polytopes;

Classification

Mainly methodology

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