

**Ongaro, A.; Migliorati, S.**

**A generalization of the Dirichlet distribution.** (English) Zbl 1258.60020  
*J. Multivariate Anal.* 114, 412-426 (2013).

Summary: A new parametric family of distributions on the unit simplex is proposed and investigated. Such family, called flexible Dirichlet, is obtained by normalizing a correlated basis formed by a mixture of independent gamma random variables. The Dirichlet distribution is included as an inner point. The flexible Dirichlet is shown to exhibit a rich dependence pattern, capable of discriminating among many of the independence concepts relevant for compositional data. At the same time, it can model multi-modality. A number of stochastic representations are given, disclosing its remarkable tractability. In particular, it is closed under marginalization, conditioning, subcomposition, amalgamation and permutation.

**MSC:**

- [60E05](#) Probability distributions: general theory
- [62E15](#) Exact distribution theory in statistics
- [62H05](#) Characterization and structure theory for multivariate probability distributions; copulas

Cited in **2** Reviews  
Cited in **7** Documents

**Keywords:**

[Dirichlet mixture](#); [subcomposition](#); [amalgamation](#); [compositional invariance](#); [neutrality](#); [multi-modality](#)

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