Mixture models with decreasing weights and their applications.

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Mixture densities are a flexible and powerful tool in different research fields to model heterogeneity. Under a Bayesian nonparametric approach, the mixing distribution is given by some discrete random probability measure (RPM) and the resulting mixture model has some interesting properties since, for example, it allows us to infer about the number of groups and also about the clustering structure of the data. Among the different discrete RPMs, the Dirichlet process represents the most known and used. However, there exists a new class of these probability measures, based on the so-called geometric process, having simpler yet flexible enough weight sequences which make them an appealing option for this context. In this talk, we present some specific examples of decreasing-weight mixture models, study their properties and illustrate their performance in clustering modeling and density estimation. Throughout this work, we compare these models with the one obtained from the Dirichlet process.