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AN IMPROVEMENT OF THE EM ALGORITHM FOR FINITE POISSON MIXTURES

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Abstract

Finite Poisson mixtures can be used in a variety of real applications to describe count data as they can describe situations where overdispersion relative to the simple Poisson model is present. They also admit a natural interpretation: the entire population is a mixture of k subpopulations each having a Poisson distribution giving rise to the k-finite Poisson distribution. Estimating the parameters of a k-finite Poisson mixture is not easy. However, the development of the EM algorithm for finite mixtures simplified the derivation of the maximum likelihood estimates. In this paper an improvement of the standard EM algorithm for finite Poisson mixtures is introduced. It is based on the result that one from the estimating equations for the Maximum Likelihood Estimates in the case of finite Poisson mixtures is the first moment equation. Hence, replacing one of the estimating equations by this simpler form can help us considerably in reducing the labour and the cost of calculating the MLE. Tables verifying the results are also given.

Keywords and phrases: Poisson mixtures; k-finite mixtures; EM algorithm; maximum likelihood estimation.