

Abstract

In the past, when using the Bayesian method to estimate Poisson means, we used to choose conjugate prior distribution for computational simplicity, and we also empirically estimated the prior of the means Gamma distribution (PEB). However, if the true distribution of the means departs from Gamma distribution, PEB method is not very efficient. Laird (1978) estimated the prior distribution by nonparametric maximum likelihood (NPML), which provided another choice of the prior distribution. When the means are clustered in few values instead of having Gamma distribution, NPML method is very efficient, but when the means are very disperse, the method is not efficient. Because, most of the time, we do not know the true distribution of the means, it is hard to decide whether to use PEB or NPML method. This research first try to estimate Poisson means by Dirichlet Process (DP) method which is developed by Escobar (1994). According to our simulation study, whether the distribution of the means is Gamma distribution or discrete distribution having few values, DP method is as good as PEB method when PEB method is better than NPML method, and it is as good as NPML method when NPML method is better.