

Some problems of estimation for a multinomial distribution in the case of randomly obtainable data

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ABSTRACT

A class of sequential estimation problems for a multinomial distribution is considered in the case of randomly obtainable data in the following two situations: when data is forthcoming according to a counting process, and in the case when data is forthcoming at times represented by order statistics of positive exchangeable random variables. The problem is to find optimal stopping times and the corresponding sequential estimators for the unknown vector parameter p of m multinomials with different dimensions. In the problem of finding optimal sequential estimation procedures the intermediate approach between the Bayes and the minimax principle is applied in which it is assumed that a vague prior information on the distribution of the unknown parameter is available. It is supposed that the set of all prior distributions of the parameter p is restricted to a set Γ consisting of the priors for which certain conditions on the moments are imposed. The loss is assumed to consist of the error of estimation (represented by a weighted squared loss function) as well as the cost of observing the process. For each of the models of processes considered two classes of Γ -minimax sequential procedures for estimating p are established. In the solution of the problem of finding optimal sequential estimation procedures different methods were used for each of the statistical models.

Keywords: *minimax estimation, Bayes estimation, sequential estimation procedure, stopping time, counting process, multinomial distribution*

Mathematics Subject Classification: *62L12, 62C20, 62M05, 62F10*

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