Section 12: Probability and Statistics | Poster number 451

The Bayes sequential choice of an experiment in estimating a success probability

Alicja Jokiel-Rokita*, Wroclaw University of Technology.
Ryszard Magiera, Wroclaw University of Technology.

ABSTRACT

The paper deals with the problem of the Bayes estimation of a success probability p in the case when before each trial we can choose an experiment from among two experiments: an individual Bernoulli (p) trial or the product of r individual Bernoulli (p) trials. A total of n experiments can be performed, and the problem is to sequentially select some combination (allocation) of these experiments to achieve lower Bayes risk of the final estimate. The following criterion of choosing of the experiment has been applied: at each step choose the experiment (from among two given experiments) for which the Bayes risk of the Bayes estimator is smaller. It is assumed that the error of estimation is represented by a weighted squared loss function. This problem has its roots in reliability where one tests either single components or a system of r identical components. The problem also arises in epidemiological applications such as estimating disease prevalence.

Keywords: *Bayes estimation, Bayes risk, reliability, success probability, sequential choice*

Mathematics Subject Classification: *62C10, 62F10*

Contact Address: arokita@neyman.im.pwr.wroc.pl