

Optimal Sequential Search: A Bayesian Approach

David Assaf and Shmuel Zamir

Abstract

To the classical model of searching for one object out of n , we add uncertainty about the parameters π of the distribution of the n objects among the m boxes. Adopting a Bayesian approach, we study the optimal sequential search strategy. For the case $n = 1$, we obtain a generalization of the fundamental result of Blackwell: the strategy which searches at each stage in the “most inviting” box is optimal. This strategy is also optimal for $m = 2$ and arbitrary n . However, for $n > 1$ the optimal strategy may be very different from that of the classical model, even when the uncertainty about π is very small.

AMS 1980 subject classification. Primary 90B40.

Key words and phrases. Optimal sequential search, most inviting strategy, Bayesian approach.