

OPTIMAL ON-LINE SELECTION OF AN ALTERNATING SUBSEQUENCE: A CENTRAL LIMIT THEOREM

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In this talk, we analyze the optimal policy for the sequential selection of an alternating subsequence from a sequence of n independent observations from a continuous distribution, and we prove a central limit theorem for the number of selections made by that policy. The proof exploits the backward recursion of dynamic programming and assembles a detailed understanding of the associated value functions and selection rules. The methods used here suggest a profitable approach to the asymptotic analysis of other finite-horizon Markov decision problems. We also discuss how this result relates to classical central limit theorems for functionals of time non-homogeneous Markov chains.