Regret Minimization on Non-Parametric Bandits via the Empirical Likelihood Method

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Abstract

An agent must choose at each time step among K options, each producing an independent draw of an unknown probability distribution. Her goal is to maximize the sum of the values obtained. How should she make her choices?

For the case where the random variables are only assumed to be bounded, we propose an asymptotically optimal algorithm based on the construction of upper confidence bounds obtained by the Empirical Likelihood Method.