

Adaptivity to smoothness in X -armed bandits

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We study the stochastic continuum-armed bandit problem from the angle of adaptivity to unknown regularity of the reward function f . We prove that there exists no strategy for the cumulative regret that adapts optimally to the smoothness of f - while strategies that are adaptive to the smoothness exist for the simple regret . We show however that such minimax optimal adaptive strategies for the cumulative regret exist if the learner is given extra-information about f . Finally, we complement our positive results with matching lower bounds (up to logarithmic terms).

Based on a joint work with Andrea Locatelli.

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