



Best arm identification via Bayesian gap-based exploration

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Bayesian approaches to optimization under bandit feedback have recently become quite popular in the machine learning community. Methods of this type have been found to have not only very good empirical performance, but also optimal theoretical regret bounds when analyzed from a frequentist perspective. In this work we study theoretical, methodological, and empirical aspects of the problem of best arm identification in stochastic multi-armed bandits from a Bayesian perspective. In particular, we introduce a Bayesian version of the gap-based method of (Gabillon et al., 2012). In the domain of sensor networks, with real traffic data, this approach shows significant gains in performance over both Bayesian cumulative regret techniques and frequentist simple re- gret methods.

Subjects: **Machine Learning (stat.ML)**; Learning (cs.LG)

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