

**RISK SENSITIVE ADAPTIVE CONTROL OF DISCRETE TIME MARKOV  
PROCESSES**

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*Abstract:* Adaptive control of discrete time Markov processes with an infinite horizon risk sensitive cost functional is investigated. The continuity of the optimal risk sensitive cost with respect to a parameter of the transition probability is verified. Two almost optimal adaptive procedures that are based on the large deviations of the cost functional and discretized maximum likelihood estimates are given. To justify the performance of the adaptive procedure with observations of the cost, some large deviations estimates of the empirical distributions of finite sequences of successive states of Markov processes are obtained. A finite family of continuous control functions, where one control function is fixed after a nonrandom time from each of the adaptive procedures, provides an almost optimal adaptive control.

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