This article presents an important continuity result. Specifically, it considers discrete-time Markov decision processes with denumerable state space, taking into account the risk-sensitive average cost as the objective function. (It is supposed that the controller has a constant risk-sensitivity coefficient.) Compactness and continuity assumptions, which are standard in the Markov decision processes literature, are imposed on the admissible actions sets, on the transition probability law, and on the cost function. Moreover, a general version of the simultaneous Doeblin condition is imposed as a recurrence requirement. In this context, the continuity (at zero) of the optimal average cost with respect to the risk-sensitivity coefficient is obtained as the main result. This continuity result extends previous specific continuity cases whose references are provided in the introduction of the paper. The primary technique used to establish the continuity result is the vanishing discount factor approach. Also, examples are given to show that the continuity result is not valid under weaker recurrence assumptions, such as the Lyapunov function condition.

Reviewed by Raúl Montes-de-Oca

References


This list reflects references listed in the original paper as accurately as possible with no attempt to correct error.