

Exact finite approximations of average-cost countable Markov Decision Processes

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Abstract

For a countable-state Markov decision process we introduce an embedding which produces a finite-state Markov decision process. The finite-state embedded process has the same optimal cost, and moreover, it has the same dynamics as the original process when restricting to the approximating set. The embedded process can be used as an approximation which, being finite, is more convenient for computation and implementation.

Keywords: Markov Decision Processes, countable state space, finite approximations, average cost criterion.

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