KYBERNETIKA — VOLUME *32* (1996), NUMBER 1, PAGES 1-16

Time-Discretization for Controlled Markov Processes Part I: General Approximation Results

Nico M. van Dijk; Arie Hordijk

Abstract: The method of time-discretization is investigated in order to approximate finite horizon cost functions for continuous-time stochastic control problems. The approximation method is based on approximating time-differential equations by one-step difference methods. In this paper general approximation results will be developed. An approximation lemma is presented. This lemma enables us to conclude orders of converge, which makes the method of computational interest. Also unbounded cost functions are allowed. We concentrate on approximations induced by discrete-time controlled Markov processes. The approximation can in principle be computed recursively by using discrete-time dynamic programming. In a subsequent second paper two applications will be studied in detail.

Keywords:

AMS Subject Classification: