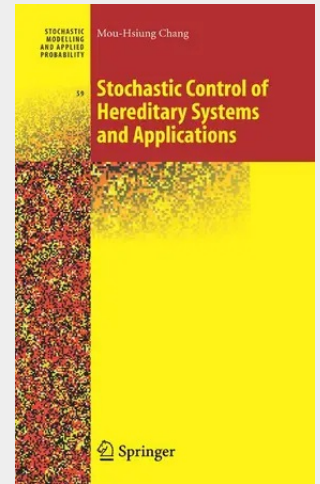


Stochastic Control of Hereditary Systems and Applications

This research monograph develops the Hamilton-Jacobi-Bellman theory via dynamic programming principle for a class of optimal control problems for stochastic hereditary differential equations (SHDEs) driven by a standard Brownian motion and with a bounded or an infinite but fading memory. These equations represent a class of stochastic infinite-dimensional systems that become increasingly important and have wide range of applications in physics, chemistry, biology, engineering and economics/finance. This monograph covers a very active research area. It can be used as a research reference for researchers and advanced graduate students who have special interest in optimal control theory and applications of stochastic hereditary systems.

This research monograph develops the Hamilton-Jacobi-Bellman (HJB) theory via the dynamic programming principle for a class of optimal control problems for stochastic hereditary differential equations (SHDEs) driven by a standard Brownian motion and with a bounded or an unbounded but fading memory. These equations represent a class of infinite-dimensional stochastic systems that become increasingly important and have wide range of applications in physics, chemistry, biology, engineering, and economics/finance. The wide applicability of these systems is due to the fact that the reaction of real-world systems to exogenous effects/signals is never instantaneous, and it needs some time, time that can be translated into a mathematical language by some delay terms. Therefore, to describe these delayed effects, the drift and diffusion coefficients of these stochastic equations depend not only on the current state but also explicitly on the past history of the state variable. The theory developed herein extends the infinite-dimensional HJB theory of controlled diffusion processes to its infinite-dimensional counterpart for controlled SHDEs in which a certain infinite-dimensional Banach space or Hilbert space is critically involved in order to account for the bounded or unbounded memory. Another type of infinite-dimensional HJB theory that is not treated in this monograph but arises from real-world application problems can often be modeled by controlled stochastic partial differential equations. Although they are both infinite dimensional in nature and are both in the infancy of their developments, the SHDE exhibits many characteristics that are not in common with stochastic partial differential equations. Consequently, the HJB theory for controlled SHDEs is parallel to and cannot be treated as a subset of the theory developed for controlled stochastic partial differential equations.



106,99 €

99,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9781441926050

Medium: Buch

ISBN: 978-1-4419-2605-0

Verlag: Humana

Erscheinungstermin: 23.11.2010

Sprache(n): Englisch

Auflage: 1. Auflage. Softcover version of original hardcover Auflage 2008

Serie: Stochastic Modelling and Applied Probability

Produktform: Kartoniert

Gewicht: 639 g

Seiten: 406

Format (B x H): 155 x 235 mm

