1. Record Nr. UNINA9910158672003321

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Titolo	Adaptive Dynamic Programming with Applications in Optimal Control / / by Derong Liu, Qinglai Wei, Ding Wang, Xiong Yang, Hongliang Li
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2017
Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (XXX, 594 p. 203 illus., 175 illus. in color.)
Collana	Advances in Industrial Control, , 1430-9491
Disciplina	670.427
Soggetti	Control engineering Computational intelligence Statistical physics Control and Systems Theory Computational Intelligence Applications of Nonlinear Dynamics and Chaos Theory
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	History of Adaptive Dynamic Programming -- Part I: Continuous-Time Systems -- Optimal Control of Continuous-Time Affine Nonlinear Systems -- Optimal Control of Nonaffine Continuous-Time Systems -- Robust and Guaranteed Cost Control of Continuous-Time Nonlinear Systems -- Decentralized Stabilization and Control of Nonlinear Interconnected Systems -- Online Synchronous Optimal Learnign Algorithms for Multiplayer Nonzero-Sum Games with Unknown Dynamics -- Part II: Discrete-Time Systems -- Value Iteration Adaptive Dynamic Programming for Discrete-Time Nonlinear Systems -- Finite Approximation Error-Based Value Iteration for Adaptive Dynamic Programming -- Policy Iteration for Optimal Control of Discrete-Time Nonlinear Systems -- Generalized Policy Iteration Adaptive Dynamic Programming for Discrete-Time Nonlinear Systems -- Error-Bound Analysis of Adaptive Dynamic Programming Algorithms for Solving Undiscounted Optimal Control Problems -- Part III: Applications -- Adaptive Dynamic Programming for Renewable Energy Scheduling and Battery Management in Smart Homes -- Adaptive Dynamic

Programming for Optimal Tracking Control of a Coal Gasification Process -- Data-Driven Neuro-Optimal Temperature Control of Water–Gas Shift Reaction.

Sommario/riassunto

This book covers the most recent developments in adaptive dynamic programming (ADP). The text begins with a thorough background review of ADP making sure that readers are sufficiently familiar with the fundamentals. In the core of the book, the authors address first discrete- and then continuous-time systems. Coverage of discrete-time systems starts with a more general form of value iteration to demonstrate its convergence, optimality, and stability with complete and thorough theoretical analysis. A more realistic form of value iteration is studied where value function approximations are assumed to have finite errors. Adaptive Dynamic Programming also details another avenue of the ADP approach: policy iteration. Both basic and generalized forms of policy-iteration-based ADP are studied with complete and thorough theoretical analysis in terms of convergence, optimality, stability, and error bounds. Among continuous-time systems, the control of affine and nonaffine nonlinear systems is studied using the ADP approach which is then extended to other branches of control theory including decentralized control, robust and guaranteed cost control, and game theory. In the last part of the book the real-world significance of ADP theory is presented, focusing on three application examples developed from the authors' work: • renewable energy scheduling for smart power grids; • coal gasification processes; and • water–gas shift reactions. Researchers studying intelligent control methods and practitioners looking to apply them in the chemical-process and power-supply industries will find much to interest them in this thorough treatment of an advanced approach to control. Advances in Industrial Control aims to report and encourage the transfer of technology in control engineering. The rapid development of control technology has an impact on all areas of the control discipline. The series offers an opportunity for researchers to present an extended exposition of new work in all aspects of industrial control.