

1. Record Nr.	UNINA9910973434503321
Autore	Haddad Wassim M. <1961->
Titolo	Stability and control of large-scale dynamical systems : a vector dissipative systems approach / / Wassim M. Haddad, Sergey G. Nersesov
Pubbl/distr/stampa	Princeton, N.J., : Princeton University Press, c2011
ISBN	9786613379719 9781283379717 1283379716 9781400842667 1400842662
Edizione	[Course Book]
Descrizione fisica	1 online resource (389 p.)
Collana	Princeton series in applied mathematics
Altri autori (Persone)	NersesovSergey G. <1976->
Disciplina	003/.71
Soggetti	Lyapunov stability Energy dissipation Dynamics Large scale systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front matter -- Contents -- Preface -- Chapter One. Introduction -- Chapter Two. Stability Theory via Vector Lyapunov Functions -- Chapter Three. Large-Scale Continuous-Time Interconnected Dynamical Systems -- Chapter Four. Thermodynamic Modeling of Large-Scale Interconnected Systems -- Chapter Five. Control of Large-Scale Dynamical Systems via Vector Lyapunov Functions -- Chapter Six. Finite-Time Stabilization of Large-Scale Systems via Control Vector Lyapunov Functions -- Chapter Seven. Coordination Control for Multiagent Interconnected Systems -- Chapter Eight. Large-Scale Discrete-Time Interconnected Dynamical Systems -- Chapter Nine. Thermodynamic Modeling for Discrete-Time Large-Scale Dynamical Systems -- Chapter Ten. Large-Scale Impulsive Dynamical Systems -- Chapter Eleven. Control Vector Lyapunov Functions for Large-Scale Impulsive Systems -- Chapter Twelve. Finite-Time Stabilization of Large-Scale Impulsive Dynamical Systems -- Chapter Thirteen. Hybrid

Sommario/riassunto

Modern complex large-scale dynamical systems exist in virtually every aspect of science and engineering, and are associated with a wide variety of physical, technological, environmental, and social phenomena, including aerospace, power, communications, and network systems, to name just a few. This book develops a general stability analysis and control design framework for nonlinear large-scale interconnected dynamical systems, and presents the most complete treatment on vector Lyapunov function methods, vector dissipativity theory, and decentralized control architectures. Large-scale dynamical systems are strongly interconnected and consist of interacting subsystems exchanging matter, energy, or information with the environment. The sheer size, or dimensionality, of these systems necessitates decentralized analysis and control system synthesis methods for their analysis and design. Written in a theorem-proof format with examples to illustrate new concepts, this book addresses continuous-time, discrete-time, and hybrid large-scale systems. It develops finite-time stability and finite-time decentralized stabilization, thermodynamic modeling, maximum entropy control, and energy-based decentralized control. This book will interest applied mathematicians, dynamical systems theorists, control theorists, and engineers, and anyone seeking a fundamental and comprehensive understanding of large-scale interconnected dynamical systems and control.
