1.	Record Nr.	UNINA9910818059203321
	Autore	Blanchini Franco
	Titolo	Set-Theoretic Methods in Control / / by Franco Blanchini, Stefano Miani
	Pubbl/distr/stampa	Boston, MA : , : Birkhäuser Boston : , : Imprint : Birkhäuser, , 2008
	ISBN	1-281-10797-2
		9786611107970
		0-8176-4606-X
	Edizione	[1st ed. 2008.]
	Descrizione fisica	1 online resource (500 p.)
	Collana	Systems & Control: Foundations & Applications, , 2324-9757
	Altri autori (Persone)	MianiStefano
	Disciplina	629.8312
	Soggetti	Control engineering
		System theory
		Control theory
		Robotics
		Automation
		Mathematical optimization
		Calculus of variations
		Engineering mathematics
		Engineering - Data processing
		Computational intelligence
		Control and Systems Theory
		Systems Theory, Control
		Control, Robotics, Automation
		Calculus of Variations and Optimization
		Mathematical and Computational Engineering Applications
		Computational Intelligence
	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	Lyapunov and Lyapunov-like functions -- Convex sets and their representation -- Invariant sets -- Dynamic programming -- Set-theoretic analysis of dynamic systems -- Control of parameter-varying systems -- Control with time-domain constraints -- (Sub-)Optimal control -- Set-theoretic estimation -- Related topics.

Sommario/riassunto

This self-contained monograph describes basic set-theoretic methods for control and provides a discussion of their links to fundamental problems in Lyapunov stability analysis and stabilization, optimal control, control under constraints, persistent disturbance rejection, and uncertain systems analysis and synthesis. New computer technology has catalyzed a resurgence of research in this area, particularly in the development of set-theoretic techniques, many of which are computationally demanding. The work presents several established and potentially new applications, along with numerical examples and case studies. A key theme of the presentation is the trade-off between exact (but computationally intensive) and approximate (but conservative) solutions to problems. Mathematical language is kept to the minimum necessary for the adequate formulation and statement of main concepts. Numerical algorithms for the solution of the proposed problems are described in detail. Set-Theoretic Methods in Control is accessible to readers familiar with the basics of systems and control theory; prerequisites such as convexity theory are included. The text provides a solid foundation of mathematical techniques and applications and also features avenues for further theoretical study. Aimed primarily at graduate students and researchers in applied mathematics and engineering, the book will also appeal to practitioners since it contains extensive references to the literature and supplies many recipes for solving significant control problems.