1. Record Nr. UNINA9910975421303321

Autore	Sastry Shankar
Titolo	Nonlinear Systems : Analysis, Stability, and Control / / by Shankar Sastry
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 1999
ISBN	1-4757-3108-6
Edizione	[1st ed. 1999.]
Descrizione fisica	1 online resource (XXVI, 668 p.)
Collana	Interdisciplinary Applied Mathematics, , 2196-9973 ; ; 10
Classificazione	93Cxx 93Dxx
Disciplina	515.64 003.75
Soggetti	Mathematical optimization Calculus of variations Calculus of Variations and Optimization
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"With 193 Illustrations."
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1 Linear vs. Nonlinear -- 2 Planar Dynamical Systems -- 3 Mathematical Background -- 4 Input-Output Analysis -- 5 Lyapunov Stability Theory -- 6 Applications of Lyapunov Theory -- 7 Dynamical Systems and Bifurcations -- 8 Basics of Differential Geometry -- 9 Linearization by State Feedback -- 10 Design Examples Using Linearization -- 11 Geometric Nonlinear Control -- 12 Exterior Differential Systems in Control -- 13 New Vistas: Multi-Agent Hybrid Systems -- References.
Sommario/riassunto	There has been a great deal of excitement in the last ten years over the emer- gence of new mathematical techniques for the analysis and control of nonlinear systems: Witness the emergence of a set of simplified tools for the analysis of bifurcations, chaos, and other complicated dynamical behavior and the develop- ment of a comprehensive theory of geometric nonlinear control. Coupled with this set of analytic advances has been the vast increase in computational power available for both the simulation and visualization of nonlinear systems as well as for the implementation in real time of sophisticated, real-time nonlinear control laws. Thus, technological advances havebolstered the impact of analytic advances and produced

a tremendous variety of new problems and applications that are nonlinear in an essential way. Nonlinear controllaws have been implemented for sophisticated flight control systems on board helicopters, and vertical take offand landing aircraft; adaptive, nonlinearcontrollaws havebeen implementedfor robot manipulators operating either singly, or in cooperation on a multi-fingered robot hand; adaptive control laws have been implemented forjetengines andautomotive fuel injection systems, as well as for automated highway systems and air traffic management systems, to mention a few examples. Bifurcation theory has been used to explain and understand the onset of fiutterin the dynamics of aircraft wing structures, the onset of oscillations in nonlinear circuits, surge and stall in aircraft engines, voltage collapse in a power transmission network.