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	Descrizione fisica	1 online resource (454 pages)
	Collana	Communications and Control Engineering, , 0178-5354
	Disciplina	629.8312
	Soggetti	Automatic control
		System theory
		Engineering mathematics
		Control and Systems Theory
		Systems Theory, Control
		Engineering Mathematics
	Lingua di pubblicazione	Inglese
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	Nota di contenuto	Chapter 1. Introduction -- Part I: Models of Control Systems and Stability Analysis -- Chapter 2. Finite-Dimensional Models -- Chapter 3. Innite-Dimensional Models -- Chapter 4. Stability and Convergence Rate -- Chapter 5. Method of Lyapunov Functions -- Part II: Homogeneous Control Systems -- Chapter 6. Dilation Groups in Banach, Hilbert and Euclidean Spaces -- Chapter 7. Homogeneous Mappings -- Chapter 8. Analysis of Homogeneous Dynamical Systems -- Chapter 9. Homogeneous Stabilization -- Chapter 10. Consistent Discretization of Homogeneous Models -- Chapter 11. Homogeneous State Estimation -- Chapter 12. Homogeneous Optimal Control -- Appendix -- Index.
	Sommario/riassunto	This monograph introduces the theory of generalized homogeneous systems governed by differential equations in both Euclidean (finite-dimensional) and Banach/Hilbert (infinite-dimensional) spaces. It develops methods of stability and robustness analysis, control design, state estimation and discretization of homogeneous control systems. Generalized Homogeneity in Systems and Control is structured in two

parts. Part I discusses various models of control systems and related tools for their analysis, including Lyapunov functions. Part II deals with the analysis and design of homogeneous control systems. Some of the key features of the text include: mathematical models of dynamical systems in finite-dimensional and infinite-dimensional spaces; the theory of linear dilations in Banach spaces; homogeneous control and estimation; simple methods for an "upgrade" of existing linear control laws; numerical schemes for a consistent digital implementation of homogeneous algorithms; and experiments confirming an improvement of PID controllers. The advanced mathematical material will be of interest to researchers, mathematicians working in control theory and mathematically oriented control engineers.