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Descrizione fisica	1 online resource (XXXVII, 226 p. 82 illus., 72 illus. in color.)
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Disciplina	003.74
Soggetti	Automatic control System theory Control and Systems Theory Systems Theory, Control
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Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Introduction -- Regulator Problem for Linear Systems with Constraints on Control and Its Increment -- Constrained Control and Rate or Increment for Linear Systems with Additivie Disturbances -- Robust Constratined Linear Regulator Problem -- Observer-Based Constrained Control -- Observer-Based Regulator Problem for WWTP with Constraints on the Control -- Regulator Problem for Linear Singular Systems with Constrained Control -- Regulation of Linear Singular Systems under Constrained Control Magnitude and Rate -- Constrained Observer-Based Control for Linear Singular Systems -- Stability and Control Synthesis for Discrete-Time Linear Systems Subject to Actuator Saturation by Output Feedback -- The Regulator Problem for Linear Systems with Asymmetric Saturations on the Control and Its Increments or Rate: An LMI Approach -- Stabilization of Unsymmetrical Saturated Control: An LMI Approach -- System Stabilization by Unsymmetrical Constrained State Feedback -- Control of a Hydrogen Reformer with Output Feedback: An LMI Approach -- l1-control Using Linear Programming for Systems with Asymmetric Bounds -- Stabilization of 2-D Continuous Systems with Multi-Delays and Saturated Control.
Sommario/riassunto	This book deals with a combination of two main problems for the first

time. They are saturation on control and on the rate (or increment) of the control, and the solution of unsymmetrical saturation on the control by LMIs. It treats linear systems in state space form, in both the continuous- and discrete-time domains. Necessary and sufficient conditions are derived for autonomous linear systems with constrained state increment or rate, such that the system evolves respecting incremental or rate constraints if any. A pole assignment technique is then used to solve the problem, giving stabilizing state feedback controllers that respect non-symmetrical constraints on control alone or on both control and its increment or rate. Illustrative examples show the application of these methods on academic examples or on such real plant models as the double integrator system. This problem is then extended to various others including: systems with constraints and perturbations; singular systems with constrained control; systems with unsymmetrical saturations; saturated systems with delay, and 2-D systems with saturations. The solutions obtained are of two types: necessary and sufficient conditions solved with linear programming techniques; and sufficient conditions under LMIs. A new approach extends existing techniques for dealing with symmetrical saturations to take direct account of unsymmetrical saturations into account with LMIs. This tool enables the authors to obtain new results on continuous- and discrete-time systems. The book uses illustrative examples and figures and provides many comparisons with existing results. Systems theoreticians interested in multidimensional systems and practitioners working with saturated and constrained controllers will find the research and background presented in Saturated Control of Linear Systemsi> to be of considerable interest in helping them overcome problems with their plant and in stimulating further research.