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| Nota di contenuto | Contents; Preface; Chapter 1 The Watt governor and the mathematical theory of stability of motion; 1.1 The Watt flyball governor and its modifications; 1.2 The Hermite-Mikhailov criterion; 1.3 Theorem on stability by the linear approximation 1.4 The Watt governor transient processes Chapter 2 Linear electric circuits. Transfer functions and frequency responses of linear blocks; 2.1 Description of linear blocks; 2.2 Transfer functions and frequency responses of linear blocks; Chapter 3 Controllability, observability, stabilization; 3.1 Controllability 3.2 Observability 3.3 A special form of the systems with controllable pair (A,b); 3.4 Stabilization. The Nyquist criterion; 3.5 The time-varying stabilization. The Brockett problem; Chapter 4 Two-dimensional control systems. Phase portraits; 4.1 An autopilot and spacecraft orientation system 4.2 A synchronous electric machine control and phase locked loops 4.3 The mathematical theory of populations; Chapter 5 Discrete systems; 5.1 Motivation; 5.2 Linear discrete systems; 5.3 The discrete phase locked loops for array processors Chapter 6 The Aizerman conjecture. The Popov method Bibliography; Index |

Sommario/riassunto

This book shows clearly how the study of concrete control systems has motivated the development of the mathematical tools needed for solving such problems. In many cases, by using this apparatus, far-reaching generalizations have been made, and its further development will have an important effect on many fields of mathematics. In the book a way is demonstrated in which the study of the Watt flyball governor has given rise to the theory of stability of motion. The criteria of controllability, observability, and stabilization are stated. Analysis is made of dynamical systems, which describe a
