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Autore	Hellerstein Joseph L.
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Nota di contenuto	Feedback Control of Computing Systems; Contents; PREFACE; PART I BACKGROUND; 1 Introduction and Overview; 1.1 The Nature of Feedback Control; 1.2 Control Objectives; 1.3 Properties of Feedback Control Systems; 1.4 Open-Loop versus Closed-Loop Control; 1.5 Summary of Applications of Control Theory to Computing Systems; 1.6 Computer Examples of Feedback Control Systems; 1.6.1 IBM Lotus Domino Server; 1.6.2 Queueing Systems; 1.6.3 Apache HTTP Server; 1.6.4 Random Early Detection of Router Overloads; 1.6.5 Load Balancing; 1.6.6 Streaming Media; 1.6.7 Caching with Differentiated Service 1.7 Challenges in Applying Control Theory to Computing Systems 1.8 Summary; 1.9 Exercises; PART II SYSTEM MODELING; 2 Model Construction; 2.1 Basics of Queueing Theory; 2.2 Modeling Dynamic Behavior; 2.2.1 Model Variables; 2.2.2 Signals; 2.2.3 Linear, Time-Invariant Difference Equations; 2.2.4 Nonlinearities; 2.3 First-Principles Models; 2.4 Black-Box Models; 2.4.1 Model Scope; 2.4.2 Experimental Design; 2.4.3 Parameter Estimation; 2.4.4 Model Evaluation; 2.5

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 3.3.4 Dominant Poles and Model Simplification 3.3.5 Simulating Transfer Functions; 3.4 Summary; 3.5 Extended Examples; 3.5.1 M/M/1/K from System Identification; 3.5.2 IBM Lotus Domino Server: Sensor Delay; 3.5.3 Apache HTTP Server: Combining Control Inputs; *3.6 Z-Transforms and MATLAB; 3.7 Exercises; 4 System Modeling with Block Diagrams; 4.1 Block Diagrams Basics; 4.2 Transforming Block Diagrams; 4.2.1 Special Aggregations of Blocks; 4.3 Transfer Functions for Control Analysis; 4.4 Block Diagram Restructuring; 4.5 Summary; 4.6 Extended Examples; 4.6.1 IBM Lotus Domino Server
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 5.9 Extended Examples

Sommario/riassunto

This is the first practical treatment of the design and application of feedback control of computing systems. MATLAB files for the solution of problems and case studies accompany the text throughout. The book discusses information technology examples, such as maximizing the efficiency of Lotus Notes. This book results from the authors' research into the use of control theory to model and control computing systems. This has important implications to the way engineers and researchers approach different resource management problems. This guide is well suited for professionals and researchers i