System Dynamics. Modeling, Simulation, and Control of Mechatronic Systems. 5th Edition

Description: An expanded new edition of the bestselling system dynamics book using the bond graph approach

A major revision of the go-to resource for engineers facing the increasingly complex job of dynamic systems design, System Dynamics, Fifth Edition adds a completely new section on the control of mechatronic systems, while revising and clarifying material on modeling and computer simulation for a wide variety of physical systems.

This new edition continues to offer comprehensive, up-to-date coverage of bond graphs, using these important design tools to help readers better understand the various components of dynamic systems. Covering all topics from the ground up, the book provides step-by-step guidance on how to leverage the power of bond graphs to model the flow of information and energy in all types of engineering systems. It begins with simple bond graph models of mechanical, electrical, and hydraulic systems, then goes on to explain in detail how to model more complex systems using computer simulations. Readers will find:

New material and practical advice on the design of control systems using mathematical models

New chapters on methods that go beyond predicting system behavior, including automatic control, observers, parameter studies for system design, and concept testing

Coverage of electromechanical transducers and mechanical systems in plane motion

Formulas for computing hydraulic compliances and modeling acoustic systems

A discussion of state-of-the-art simulation tools such as MATLAB and bond graph software

Complete with numerous figures and examples, System Dynamics, Fifth Edition is a must-have resource for anyone designing systems and components in the automotive, aerospace, and defense industries. It is also an excellent hands-on guide on the latest bond graph methods for readers unfamiliar with physical system modeling.

Contents:

Preface xi

1 Introduction 1

1.1 Models of Systems, 4

1.2 Systems, Subsystems, and Components, 7

1.3 State-Determined Systems, 9

1.4 Uses of Dynamic Models, 10

1.5 Linear and Nonlinear Systems, 11

1.6 Automated Simulation, 12

References, 13

Problems, 14

2 Multiport Systems and Bond Graphs 17

2.1 Engineering Multiports, 17
9.3 Application to Vehicle Dynamics, 445
9.4 Summary, 452
References, 452
Problems, 453

10 Distributed-Parameter Systems 470
10.1 Simple Lumping Techniques for Distributed Systems, 471
10.1.1 Longitudinal Motions of a Bar, 471
10.1.2 Transverse Beam Motion, 476
10.2 Lumped Models of Continua through Separation of Variables, 482
10.2.1 The Bar Revisited, 483
10.2.2 Bernoulli–Euler Beam Revisited, 491
10.3 General Considerations of Finite-Mode Bond Graphs, 499
10.3.1 How Many Modes Should Be Retained?, 499
10.3.2 How to Include Damping, 503
10.3.3 Causality Consideration for Modal Bond Graphs, 503
10.4 Assembling Overall System Models, 508
10.5 Summary, 512
References, 512
Problems, 512

11 Magnetic Circuits and Devices 519
11.1 Magnetic Effort and Flow Variables, 519
11.2 Magnetic Energy Storage and Loss, 524
11.3 Magnetic Circuit Elements, 528
11.4 Magnetomechanical Elements, 532
11.5 Device Models, 534
References, 543
Problems, 544

12 Thermofluid Systems 548
12.1 Pseudo-Bond Graphs for Heat Transfer, 548
12.2 Basic Thermodynamics in True Bond Graph Form, 551
12.3 True Bond Graphs for Heat Transfer, 558
12.3.1 A Simple Example of a True Bond Graph Model, 561
12.3.2 An Electrothermal Resistor, 563
12.4 Fluid Dynamic Systems Revisited, 565
12.4.1 One-Dimensional Incompressible Flow, 569
12.4.2 Representation of Compressibility Effects in True Bond Graphs, 573
12.4.3 Inertial and Compressibility Effects in One-Dimensional Flow, 576
12.5 Pseudo-Bond Graphs for Compressible Gas Dynamics, 578
12.5.1 The Thermodynamic Accumulator—A Pseudo-Bond Graph Element, 579
12.5.2 The Thermodynamic Restrictor—A Pseudo-Bond Graph Element, 584
12.5.3 Constructing Models with Accumulators and Restrictors, 587
12.5.4 Summary, 590
References, 592
Problems, 592
13 Nonlinear System Simulation 600
13.1 Explicit First-Order Differential Equations, 601
13.2 Differential Algebraic Equations Caused by Algebraic Loops, 604
13.3 Implicit Equations Caused by Derivative Causality, 608
13.4 Automated Simulation of Dynamic Systems, 612
13.4.1 Sorting of Equations, 613
13.4.2 Implicit and Differential Algebraic Equation Solvers, 614
13.4.3 Icon-Based Automated Simulation, 614
13.5 Example Nonlinear Simulation, 616
13.5.1 Some Simulation Results, 620
13.6 Summary, 623
References, 624
Problems, 624
Appendix: Typical Material Property Values Useful in Modeling
Mechanical, Acoustic, and Hydraulic Elements 630
Index 633
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