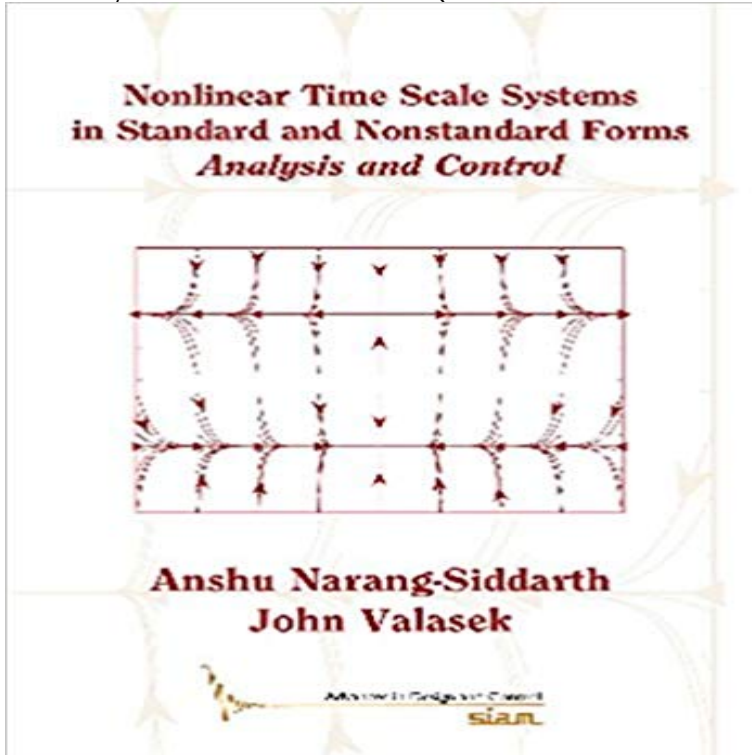


Nonlinear Time Scale Systems in Standard and Nonstandard Forms: Analysis and Control (Advances in Design and Control)



This book introduces key concepts for systematically controlling engineering systems that possess interacting phenomena occurring at widely different speeds. The aim is to present the reader with control techniques that extend the benefits of model reduction of singular perturbation theory to a larger class of nonlinear dynamical systems. New results and relevant background are presented through insightful examples that cover a wide range of applications from different branches of engineering. This book is unique because it presents a new perspective on existing control methods and thus broadens their application to a larger class of nonlinear dynamical systems. It also discusses general rather than problem-specific developments to certain applications or disciplines in order to provide control engineers with useful analytical tools, and it addresses new control problems using singular perturbation methods, including closed-form results for control of nonminimum phase systems. Audience: Nonlinear Time Scale Systems in Standard and Nonstandard Forms: Analysis and Control is intended for researchers and practitioners who use time scale methods to mitigate the curse of dimensionality and higher order controllers. It will be specifically useful to aerospace, mechanical, and electrical engineers, as well as students and researchers in applied mathematics interested in systems and control. It will also be of interest to physicists, biologists, and chemists who use time scale techniques. Contents: Preface; Chapter 1: Introduction; Chapter 2: Analyzing Time Scale Systems; Chapter 3: Two Stage Design; Chapter 4: Sequential Design; Chapter 5: Sequential Design for Multiple Time Scale Systems; Chapter 6: Some Applications to Control of Nonminimum Phase Systems; Chapter 7: Simultaneously Tracking Slow and Fast

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