Nonlinear Model Predictive Control is a thorough and rigorous introduction to nonlinear model predictive control (NMPC) for
discrete-time and sampled-data systems. NMPC is interpreted as an approximation of infinite-horizon optimal control so that important properties like closed-loop stability, inverse optimality and suboptimality can be derived in a uniform manner. These results are complemented by discussions of feasibility and robustness. NMPC schemes with and without stabilizing terminal constraints are detailed and intuitive examples illustrate the performance of different NMPC variants. An introduction to nonlinear optimal control algorithms gives insight into how the nonlinear optimisation routine the core of any NMPC controller works. An appendix covering NMPC software and accompanying software in MATLAB(R) and C++(downloadable from www.springer.com/ISBN) enables readers to perform computer experiments exploring the possibilities and limitations of NMPC.

Nonlinear Model Predictive Control Related Books

A Pragmatic Story of Model Predictive Control: Self-Contained Algorithms and Case-Studies
Nowadays, optimality is a major concern in modern controlled systems, and since optimality generally steers the systems to the boundary of their admissible operational domain, no control designer can afford ignoring Model Predictive Control (MPC). MPC is the only control design methodology that enables systematic handling of constraints and optimality concerns. This book is addressed to under-graduate students in engineering who are interested in control design issues. It can also be used by con...

RCadvisor's Model Airplane Design Made Easy: The Simple Guide to Designing R/C Model Aircraft or Build Your Own Radio Control Flying Model Plane
Build and fly your very own model airplane design. Using clear explanations, you will learn about important design trade-offs and how to choose among them. The latest research and techniques are discussed using easy to understand language. You will discover: The special challenges faced by the smaller models and how to overcome them. How to choose the right material for each part of the airplane. Easy rules for selecting the right power system, gas or electric. When it makes sense to use one of...

Control of Ships and Underwater Vehicles: Design for Underactuated and Nonlinear Marine Systems (Advances in Industrial Control)
Most ocean vessels are underactuated but control of their motion in the real ocean environment is essential. Starting with a review of the background on ocean-vessel dynamics and nonlinear control theory, the authors' systematic approach is based on various nontrivial coordinate transformations coupled with advanced nonlinear control design methods. This strategy is then used for the development and analysis of a number of ocean-vessel control systems with the aim of achieving advanced motion co...

Nonlinear Control Systems (Communications and Control Engineering)
The purpose of this book is to present a self-contained description of the fundamentals of the theory of nonlinear control systems, with special emphasis on the differential geometric approach. The book is intended as a graduate text as well as a reference to scientists and engineers involved in the analysis and design of feedback systems. The first version of this book was written in 1983, while I was teaching at the Department of Systems Science and Mathematics at Washington University in St...

Non-Linear Predictive Control
Model based predictive control has proved to be a fertile area of research, but above all has gained enormous success with industry, especially in the context of process control. Non-linear model based predictive control is of particular interest as this best represents the dynamics of most real plants, and this book collects together the important results which have emerged in this field which are illustrated by means of simulations on industrial models. In particular there are contributions on...

Predictive Control of Power Converters and Electrical Drives
Describes the general principles and current research into Model Predictive Control (MPC): the most up-to-date control method for power converters and drives The book starts with an introduction to the subject before the first chapter on classical control methods for power converters and drives. This covers classical converter control methods and classical electrical drives control methods. The next chapter on Model predictive control first looks at predictive control methods for power converter...
Adaptive Nonlinear System Identification: The Volterra and Wiener Model Approaches (Signals and Communication Technology)

Focuses on System Identification applications of the adaptive methods presented, but which can also be applied to other applications of adaptive nonlinear processes. Covers recent research results in the area of adaptive nonlinear system identification from the authors and other researchers in the field.

Applied Nonlinear Control

Covers in a progressive fashion a number of analysis tools and design techniques directly applicable to nonlinear control problems in high performance systems (in aerospace, robotics and automotive areas).

Optimal Control of Nonlinear Processes

Dynamic optimization is rocket science - and more. This volume teaches how to harness the modern theory of dynamic optimization to solve practical problems, not only from space flight but also in emerging social applications such as the control of drugs, corruption, and terror. These innovative domains are usefully thought about in terms of populations, incentives, and interventions, concepts which map well into the framework of optimal dynamic control. This volume is designed to be a lively int...

Nonlinear Control and Analytical Mechanics

During the past decade we have had to confront a series of control design problems - involving, primarily, multibody electro-mechanical systems - in which nonlinearity plays an essential role. Fortunately, the geometric theory of nonlinear control system analysis progressed substantially during the 1980s and 90s, providing crucial conceptual tools that addressed many of our needs. However, as any control systems engineer can attest, issues of modeling, computation, and implementation quickly b...

Related Topics

Nonlinear Model Predictive Control Based

Nonlinear Model Predictive Control Matlab

Nonlinear Model Predictive Control Book

An Introduction To Nonlinear Model Predictive Control

Nonlinear Model Predictive Control Theory And Algorithms

Nonlinear Model Predictive Control From Theory To Application

Nonlinear Model Predictive Control Inverted Pendulum

Nonlinear Predictive Control Based

Nonlinear Predictive Control Techniques

Comparison Nonlinear Predictive Control