Non-Linear Control for Underactuated Mechanical Systems: Communications and Control Engineering

This book provides a comprehensive treatment of non-linear control for underactuated mechanical systems, with an emphasis on the application of feedback control to address the challenges of underactuation. It presents a rigorous mathematical framework for analyzing and designing controllers for underactuated mechanical systems, and provides a thorough exposition of the latest research results in the field. The book also includes a wealth of illustrative examples and case studies, making it an ideal resource for practitioners and researchers alike.

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Underactuated mechanical systems are a class of mechanical systems that have fewer actuators than degrees of freedom. This underactuation can make it challenging to control these systems, as it can lead to instability and poor performance. Feedback control is a powerful tool that can be

used to overcome the challenges of underactuation and to improve the performance of underactuated mechanical systems.

Non-linear Control for Underactuated Mechanical Systems (Communications and Control Engineering)

by Isabelle Fantoni

★★★★★ 5 out of 5

Language	: English
File size	: 5479 KB
Text-to-Speech	: Enabled
Print length	: 306 pages

Mathematical Framework for Non-Linear Control

The mathematical framework for non-linear control is based on the theory of differential equations. Differential equations are used to model the dynamics of underactuated mechanical systems, and they can be used to analyze the stability and performance of these systems. The mathematical framework for non-linear control also includes techniques for designing controllers for underactuated mechanical systems. These controllers can be used to stabilize the systems and to improve their performance.

Feedback Control for Underactuated Mechanical Systems

Feedback control is a control technique that uses information about the state of a system to control the system's inputs. Feedback control can be used to stabilize underactuated mechanical systems and to improve their performance. The feedback controller measures the state of the system and uses this information to calculate the appropriate control inputs. The

control inputs are then applied to the system, and they act to stabilize the system and to improve its performance.

Illustrative Examples

The book includes a number of illustrative examples that demonstrate the application of non-linear control to underactuated mechanical systems. These examples show how feedback control can be used to stabilize these systems and to improve their performance. The examples are drawn from a variety of fields, including robotics, aerospace, and automotive engineering.

Case Studies

The book also includes a number of case studies that show how non-linear control has been used to solve real-world problems. These case studies demonstrate the effectiveness of non-linear control in a variety of applications. The case studies are drawn from a variety of fields, including robotics, aerospace, and automotive engineering.

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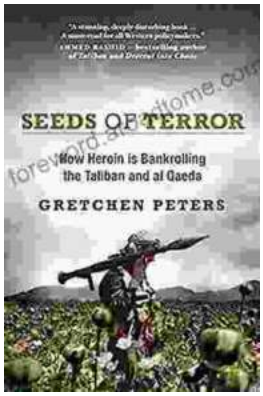

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