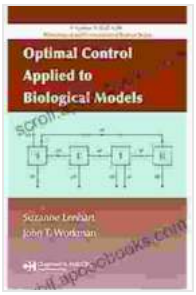
Optimal Control Applied to Biological Models: The Ultimate Guide to Modeling and Optimizing Biological Systems



Optimal Control Applied to Biological Models (Chapman & Hall/CRC Mathematical and Computational Biology Book 15) by Suzanne Lenhart

★★★★★ 5 out of 5

Language	: English
File size	: 6073 KB
Screen Reader	: Supported
Print length	: 274 pages
Hardcover	: 502 pages
Item Weight	: 1.58 pounds
Dimensions	: 6 x 1.19 x 9 inches

The field of biology is undergoing a transformative revolution, driven by the convergence of mathematical modeling and computational techniques. Optimal control theory, a branch of applied mathematics, has emerged as a powerful tool for understanding and manipulating complex biological systems.

In this comprehensive guide, "Optimal Control Applied to Biological Models," published by Chapman Hall/CRC, a team of leading experts provides a thorough exploration of this cutting-edge field. This book is an indispensable resource for researchers, practitioners, and students seeking to gain a deep understanding of optimal control theory and its applications in biology.

Key Features

- **Comprehensive Coverage:** Covers all aspects of optimal control theory, from mathematical foundations to real-world applications in biology.
- **In-Depth Examples:** Presents detailed case studies and examples to illustrate the practical uses of optimal control in biological modeling.
- **Expert Contributors:** Written by a team of renowned experts in optimal control and biological modeling.
- **Rigorous Mathematical Treatment:** Provides a rigorous mathematical foundation for understanding the theory and its application.

Content Highlights

The book is structured into three main parts:

1. **Part I: Mathematical Foundations**
    - to optimal control theory
    - Variational calculus and the Pontryagin's maximum principle
    - Numerical methods for solving optimal control problems
2. **Part II: Biological Models**
    - Modeling biological systems using ordinary differential equations
    - Parameter estimation and model calibration
    - Optimal control of biological processes, including cell growth, drug delivery, and disease progression

3. **Part III: Applications**
    - Optimal design of therapeutic interventions
    - Control of infectious diseases
    - Synthetic biology and metabolic engineering

Target Audience

This book is primarily aimed at:

- Researchers in computational biology, systems biology, and bioengineering
- Practitioners involved in modeling and optimizing biological systems
- Graduate students and advanced undergraduates in mathematics, biology, and engineering

Benefits of Reading This Book

By reading this book, readers will gain:

- A thorough understanding of optimal control theory and its application to biological models
- The ability to develop and analyze mathematical models of biological systems
- Skills in using optimal control techniques to optimize biological processes
- Knowledge of cutting-edge advancements in biological modeling and control

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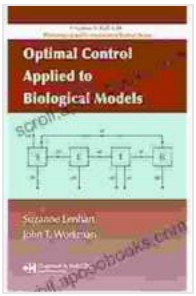
Unlock the power of optimal control theory and revolutionize your understanding of biological systems. Get your copy of this essential guide today!



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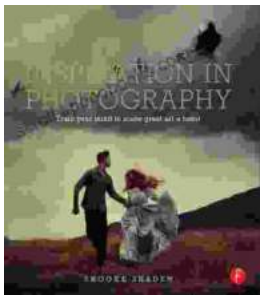

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