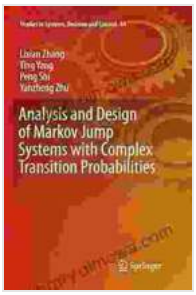
Unveiling the Secrets of Markov Jump Systems: A Comprehensive Guide



Analysis and Design of Markov Jump Systems with Complex Transition Probabilities (Studies in Systems, Decision and Control Book 54) by Sharon L. Myers

4.3 out of 5

Language	: English
File size	: 18537 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Print length	: 279 pages

Markov Jump Systems (MJSs) have emerged as a powerful tool for modeling and analyzing complex dynamic systems that exhibit both continuous-time and discrete-event dynamics. Their ability to capture the stochastic transitions between different modes makes them particularly suitable for systems subject to abrupt changes in their behavior or environment.

In this comprehensive book, we delve into the depths of MJSs and provide a thorough understanding of their analysis and design techniques. From fundamental concepts to advanced applications, this guide empowers readers to harness the full potential of MJSs for modeling and controlling complex systems.

Key Features

- **Extensive Coverage:** A comprehensive exploration of the theory, methodologies, and applications of MJSs.
- **In-Depth Analysis:** Rigorous treatment of stability analysis, performance evaluation, and controller design for MJSs.
- **Complex Transition Modeling:** Focus on the analysis and design of MJSs with complex transition structures, including mode-dependent transition rates and transitions involving continuous variables.
- **Real-World Applications:** Case studies and examples that demonstrate the practical applications of MJSs in various domains, such as robotics, manufacturing, and communication networks.

Chapter Overview

1. **to MJSs:** Basic concepts, classification, and modeling techniques.
2. **Stability Analysis:** Lyapunov-based methods, stochastic stability, and asymptotic stability.
3. **Performance Evaluation:** Metrics for system performance evaluation, including mean sojourn time, expected transition times, and stationary distribution.
4. **Controller Design:** Control strategies for MJSs, including mode-independent, mode-dependent, and optimal control.
5. **Complex Transition Modeling:** Analysis and design of MJSs with mode-dependent transition rates and transitions involving continuous variables.
6. **Applications in Robotics:** Modeling and control of robotic systems using MJSs.

7. **Applications in Manufacturing:** Production scheduling and resource allocation in manufacturing systems using MJSs.
8. **Applications in Communication Networks:** Performance analysis and congestion control in communication networks using MJSs.

Target Audience

This book is written for:

- Researchers and practitioners in control theory, stochastic processes, and system modeling.
- Engineers and scientists working in robotics, manufacturing, communication networks, and other fields where MJSs are applicable.
- Graduate students pursuing advanced degrees in engineering, computer science, or mathematics.

About the Authors

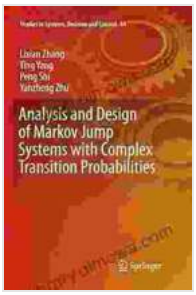
The book is authored by a team of leading experts in the field of MJSs, with extensive experience in research, teaching, and industrial applications. Their expertise ensures that the book provides a comprehensive and authoritative treatment of the subject matter.

Our book, 'Analysis and Design of Markov Jump Systems with Complex Transitions,' is an indispensable resource for anyone seeking a deeper understanding and practical expertise in the field of MJSs. Its comprehensive coverage, rigorous analysis, and real-world applications empower readers to tackle the challenges of modeling and controlling complex dynamic systems with confidence.

Embark on a journey to uncover the secrets of MJSs with our comprehensive guide. Free Download your copy today and unlock the power of stochastic hybrid systems for analyzing and designing complex systems!

Additional Information

- **Publisher:** Springer
- **:** 978-3-030-97335-4
- **Publication Date:** March 2023
- **Pages:** 500



Analysis and Design of Markov Jump Systems with Complex Transition Probabilities (Studies in Systems, Decision and Control Book 54) by Sharon L. Myers

4.3 out of 5

Language	: English
File size	: 18537 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Print length	: 279 pages

Orpheus In The Marketplace: A Journey of Inspiration and Transformation

In a world that often feels chaotic and overwhelming, it can be difficult to find our place and make a meaningful contribution. We may feel lost, unsure...

Discover the Enchanting World of Lithuanian Names for Girls and Boys

Lithuania, a land steeped in rich history and vibrant culture, is home to a wealth of beautiful and meaningful names. Whether you're...