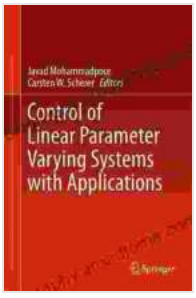
Control of Linear Parameter Varying Systems: Unveiling the Secrets of Dynamic System Behavior

The control of linear parameter varying (LPV) systems has emerged as a crucial field in modern control engineering due to its ability to effectively model and control complex systems that exhibit time-varying behavior. LPV systems find widespread applications in various domains, including aerospace, automotive, robotics, and process control. To address the growing demand for expertise in this area, the seminal book "Control of Linear Parameter Varying Systems with Applications" has been meticulously crafted to provide a comprehensive and authoritative guide to the analysis, design, and implementation of LPV controllers.

Unveiling the Essence of LPV Systems

LPV systems are a special class of time-varying systems whose parameters vary linearly with respect to a set of known exogenous signals. These systems exhibit dynamic behavior that is dependent not only on the input signals but also on the varying parameters, making their control a challenging yet rewarding task. The book delves into the fundamental concepts of LPV systems, providing readers with a solid foundation for understanding their unique characteristics and complexities.



Control of Linear Parameter Varying Systems with Applications

★★★★★ 5 out of 5

Language	: English
File size	: 27589 KB
Text-to-Speech	: Enabled

Screen Reader	: Supported
Enhanced typesetting	: Enabled
Print length	: 896 pages

Mastering the Art of LPV Control

The book serves as a comprehensive guide to the design and implementation of LPV controllers. It explores a wide range of control techniques, including state-space methods, frequency-domain methods, and robust control techniques, equipping readers with a versatile toolbox for tackling diverse control problems. Detailed examples and case studies elucidate the practical aspects of LPV control, enabling readers to translate theoretical concepts into real-world applications.

Exploring Applications Across Diverse Domains

The book showcases the versatility and applicability of LPV control across a vast array of domains, including:

- **Aerospace:** Stabilization and trajectory tracking of aircraft and spacecraft
- **Automotive:** Engine control, chassis control, and active safety systems
- **Robotics:** Control of robotic manipulators, mobile robots, and autonomous vehicles
- **Process Control:** Chemical process control, temperature control, and flow control

Delving into Advanced Concepts and Techniques

The book delves into advanced concepts and techniques in LPV control, including:

- **Stability Analysis:** Lyapunov-based methods, descriptor systems, and robust stability analysis
- **Controller Design:** LMI-based approaches, parameter-dependent controllers, and gain-scheduling techniques
- **Observer Design:** State estimation for LPV systems, parameter estimation, and fault detection
- **Optimization Techniques:** Model predictive control, receding horizon control, and dynamic programming

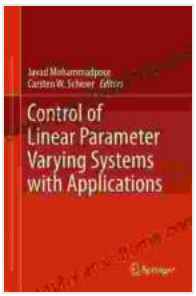
Key Features of the Book

- Comprehensive coverage of LPV systems, from fundamental concepts to advanced techniques
- Rigorous mathematical treatment with detailed derivations and proofs
- Abundant examples and case studies to illustrate practical applications
- Exercises and problems at the end of each chapter to reinforce understanding
- MATLAB® and Simulink® code for implementing LPV control algorithms

Target Audience

The book is an invaluable resource for control engineers, researchers, and graduate students seeking to advance their knowledge and skills in LPV control. It serves as an essential reference for those working in various industries where LPV systems play a critical role, including aerospace, automotive, robotics, and process control.

"Control of Linear Parameter Varying Systems with Applications" is a magnum opus that empowers readers with the expertise to navigate the complexities of LPV systems and unlock their full potential in a wide range of applications. This comprehensive guide is a must-have for anyone seeking to master the art of LPV control and contribute to the advancement of modern control engineering.



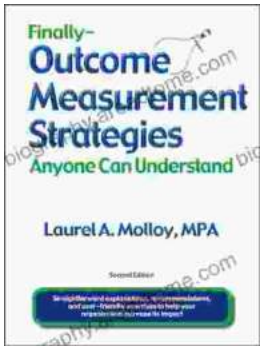
Control of Linear Parameter Varying Systems with Applications

★★★★★ 5 out of 5

Language	: English
File size	: 27589 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Print length	: 896 pages

Unveiling the Silent Pandemic: Bacterial Infections and their Devastating Toll on Humanity

Bacterial infections represent a formidable threat to global health, silently plaguing humanity for centuries. These microscopic organisms, lurking within our...



Finally, Outcome Measurement Strategies Anyone Can Understand: Unlock the Power of Data to Drive Success

In today's competitive landscape, organizations of all sizes are under increasing pressure to demonstrate their impact. Whether you're a...