

Unlocking the Future of Power Electronics: Predictive Control of Power Converters and Electrical Drives – IEEE Press 41

In the rapidly evolving world of power electronics, the demand for efficient, reliable, and high-performance systems is continually growing. These systems play a crucial role in various industries, including energy generation, distribution, transportation, and manufacturing.

Predictive control is a control strategy that utilizes future knowledge of system behavior to make optimal control decisions in real-time. It involves predicting the future behavior of the system based on its current state, inputs, and disturbances. This prediction is then used to calculate the optimal control actions that will drive the system towards its desired state.

Predictive control offers several key benefits over traditional control techniques:



Predictive Control of Power Converters and Electrical Drives (IEEE Press Book 41) by Edith Cherry

★★★★☆ 4.5 out of 5

Language : English
File size : 15856 KB
Text-to-Speech : Enabled
Screen Reader : Supported
Enhanced typesetting : Enabled
Print length : 246 pages
Lending : Enabled

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- **Improved Performance:** By anticipating future system behavior, predictive control enables the system to respond more effectively to disturbances and uncertainties. This leads to improved performance, stability, and efficiency.
- **Reduced Computational Complexity:** Predictive control algorithms can be implemented with relatively low computational complexity, making them suitable for real-time applications.
- **Increased Flexibility:** Predictive control techniques can be easily adapted to various power converter and electrical drive systems, providing a high degree of flexibility.

Predictive control has a wide range of applications in power electronics, including:

- **Power Converters:** AC-DC, DC-DC, and DC-AC converters for power supplies, motor drives, and renewable energy systems.
- **Electrical Drives:** Induction motors, permanent magnet motors, and synchronous motors for industrial automation, robotics, and electric vehicles.
- **Renewable Energy Systems:** Photovoltaic inverters, wind turbine converters, and energy storage systems.

Predictive Control of Power Converters and Electrical Drives is a comprehensive reference that provides a detailed overview of predictive control techniques for power electronics applications. Written by leading experts in the field, this book covers:

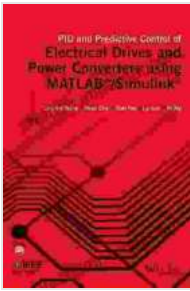
- **Fundamentals of Predictive Control:** Mathematical foundations, model-based prediction methods, and control algorithms.
- **Applications of Predictive Control:** Control of power converters, electrical drives, and renewable energy systems.
- **Case Studies and Simulations:** Practical examples and simulation results to illustrate the effectiveness of predictive control.

Predictive Control of Power Converters and Electrical Drives is an essential resource for:

- Researchers and graduate students in the field of power electronics and control systems.
- Engineers and practitioners involved in the design, development, and implementation of power converters and electrical drives.
- Industry professionals looking to stay abreast of the latest advancements in power electronics control.

Predictive Control of Power Converters and Electrical Drives is an invaluable resource for anyone seeking to understand and apply predictive control techniques in power electronics. With its comprehensive coverage, practical examples, and expert insights, this book provides a solid foundation for advancing the field of power electronics and unlocking its full potential.

Free Download your copy of Predictive Control of Power Converters and Electrical Drives today and empower yourself with the knowledge and expertise to drive power electronics innovation forward.



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