

Robust Systems Theory and Applications (Adaptive and Cognitive Dynamic Systems: Signal Processing, Learning, Communications and Control)

By Ricardo S. Sánchez-Peña, Mario Sznaier

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Robust Systems Theory and Applications (Adaptive and Cognitive Dynamic Systems: Signal Processing, Learning, Communications and Control) By Ricardo S. Sánchez-Peña, Mario Sznaier

A complete, up-to-date textbook on an increasingly important subject

Robust Systems Theory and Applications covers both the techniques used in linear robust control analysis/synthesis and in robust (control-oriented) identification. The main analysis and design methods are complemented by elaborated examples and a group of worked-out applications that stress specific practical issues: nonlinearities, robustness against changes in operating conditions, uncertain infinite dimensional plants, and actuator and sensor limitations. Designed expressly as a textbook for master's and first-year PhD students, this volume:
* Introduces basic robustness concepts in the context of SISO systems described by Laplace transforms, establishing connections with well-known classical control techniques
* Presents the internal stabilization problem from two different points of view: algebraic and state --space
* Introduces the four basic problems in robust control and the Loop shaping design method Presents the optimal *2 control problem from a different viewpoint, including an analysis of the robustness properties of *2 controllers and a treatment of the generalized *2 problem
* Presents the *2 control problem using both the state-space approach developed in the late 1980s and a Linear Matrix Inequality approach (developed in the mid 1990s) that encompasses more general problems
* Discusses more general types of uncertainties (parametric and mixed type) and ??-synthesis as a design tool
* Presents an overview of optimal ,1 control theory and covers the fundamentals of its star-norm approximation
* Presents the basic tools of model order reduction
* Provides a tutorial on robust identification
* Offers numerous end-of-chapter problems and worked-out examples of robust

control

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Robust Systems Theory and Applications (Adaptive and Cognitive Dynamic Systems: Signal Processing, Learning, Communications and Control) By Ricardo S. Sánchez-Peña, Mario Sznaier Bibliography

- Rank: #2709042 in Books
- Brand: Ricardo Sanchez Pena
- Published on: 1998-08-17
- Original language: English
- Number of items: 1
- Dimensions: 9.45" h x 1.12" w x 6.38" l, 1.85 pounds
- Binding: Hardcover
- 490 pages

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Editorial Review

From the Publisher
Focuses on robust control, currently a very important topic in control research and engineering. The interest in this area is motivated by the need to achieve greater accuracy and predictability in modern control systems, as are found in aircraft and rocket navigation systems, for example.

From the Back Cover
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