DESCRIPTION

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 Loopshaping design method. Presents the optimal $\|\cdot\|_2$ control problem from a different viewpoint, including an analysis of the robustness properties of $\|\cdot\|_2$ controllers and a treatment of the generalized $\|\cdot\|_2$ problem

* Presents the $\|\cdot\|_2$ 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 $\gamma$-synthesis as a design tool

Presents an overview of optimal $\ell_1$ 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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ABOUT THE AUTHOR

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