MULTIVARIABLE FEEDBACK CONTROL

Analysis and Design

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This is a book on practical feedback control and not on system theory in general. Feedback is used in control systems to change the dynamics of the system and to reduce the sensitivity of the system to both signal and model uncertainty.

The book presents a rigorous, yet easily readable, introduction to the analysis and design of robust multivariable control systems. It provides the reader with insights into the opportunities and limitations of feedback control. Its objective is to enable the engineer to design real control systems.

Important topics are: extensions of classical frequency-domain methods to multivariable systems, analysis of directions using the singular value decomposition, performance limitations and input-output controllability analysis, model uncertainty and robustness including the structured singular value, control structure design, and methods for controller synthesis and model reduction.

Numerous worked examples, exercises and case studies, which make frequent use of MATLAB, are included. MATLAB files for examples and figures, solutions to selected exercises, extra problems and linear state-space models for the case studies are available on the Internet.

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