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Nota di contenuto	Part I: Basic Methods and Theory -- Introduction -- Uncertainties in Control Systems -- Robust Design Specifications -- H-infinity Design -- H-infinity Loop-shaping Design Procedure -- mu-synthesis and Analysis -- LMI Design -- Lower-order Controllers -- Part II: Introduction to Robust Control Toolbox® 3 -- Building Uncertain Models -- Robust Stability and Robust Performance Analysis -- Loop-shaping Design Programs -- H Design Programs -- -synthesis and DK-iteration Programs -- Using LMI Lab, Model Reduction Programs for Robust Aerodynamic System -- Control -- Part III: Design Examples -- Robust Control of a Hard Disk Drive -- A Triple Inverted Pendulum-control-system Design -- Robust Control of a Distillation Column -- Robust Control of a Flexible link Manipulator -- Robust Control of a

Two-rotor -- Aerodynamic System -- Robust Control of a Two-rotor Aerodynamic System- Robust Control of Two-wheeled Self-balancing Robot.

Sommario/riassunto

Robust Control Design with MATLAB® (second edition) helps the student to learn how to use well-developed advanced robust control design methods in practical cases. To this end, several realistic control design examples from teaching-laboratory experiments, such as a two-wheeled, self-balancing robot, to complex systems like a flexible-link manipulator are given detailed presentation. All of these exercises are conducted using MATLAB® Robust Control Toolbox 3, Control System Toolbox and Simulink®. By sharing their experiences in industrial cases with minimum recourse to complicated theories and formulae, the authors convey essential ideas and useful insights into robust industrial control systems design using major H-infinity optimization and related methods allowing readers quickly to move on with their own challenges. The hands-on tutorial style of this text rests on an abundance of examples and features for the second edition: · rewritten and simplified presentation of theoretical and methodological material including original coverage of linear matrix inequalities; · new Part II forming a tutorial on Robust Control Toolbox 3; · fresh design problems including the control of a two-rotor dynamic system; and · end-of-chapter exercises in Part II. Electronic supplements to the written text that can be downloaded from extras.springer.com/978-1-4471-4681-0 include: · M-files developed with MATLAB® help in understanding the essence of robust control system design portrayed in text-based examples; · MDL-files for simulation of open- and closed-loop systems in Simulink®; and · sample solutions to Part II end-of-chapter exercises available free of charge to those adopting Robust Control Design with MATLAB® as a textbook for courses. Robust Control Design with MATLAB® is for graduate students and practising engineers who want to learn how to deal with robust control design problems without spending a lot of time in researching complex theoretical developments. 'Any researcher interested in the subject of robust control theory will fine this book invaluable...It is not often that one comes across such a useful book...I consider this book ideal as a teaching aid for control practitioners in final year undergraduate or first year graduate courses.' - Dr. Sillas Hadjiloucas, University of Reading.