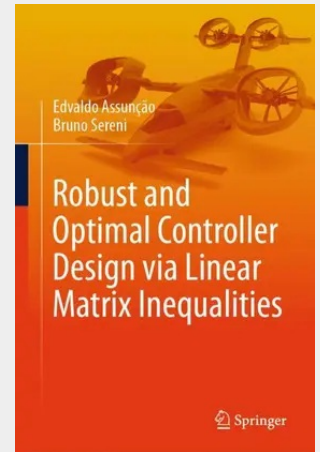


Robust and Optimal Controller Design via Linear Matrix Inequalities

This textbook provides an accessible introduction to linear matrix inequalities (LMIs) that requires no prior knowledge of the subject. It covers both the theoretical foundations and practical applications for solving real-world control problems using MATLAB, beginning with the basic introduction "My First LMI" and gradually progressing to more advanced control challenges. Essential background information on dynamic systems analysis and linear algebra is included, specifically tailored for applications in LMI-based control. Readers will learn about system stability and stabilization through an intuitive explanation of the Lyapunov energy function and its connection to LMI formulations. The core content addresses major control design problems for both continuous-time and discrete-time linear time-invariant (LTI) systems. Additionally, extensions to output feedback and linear parameter-varying (LPV) control are discussed. The theoretical foundations are complemented by practical, challenging design problems that highlight the real-world applicability of LMIs through experimental implementation on platforms such as a 3-DOF helicopter and an active suspension system.

Robust and Optimal Controller Design via Linear Matrix Inequalities provides a well-structured learning experience, empowering a new generation of students, practicing engineers, and researchers to confidently adopt and apply LMIs in both academic and industrial control applications.

This textbook provides an accessible introduction to linear matrix inequalities (LMIs) that requires no prior knowledge of the subject. It covers both the theoretical foundations and practical applications for solving real-world control problems using MATLAB, beginning with the basic introduction "My First LMI" and gradually progressing to more advanced control challenges. Essential background information on dynamic systems analysis and linear algebra is included, specifically tailored for applications in LMI-based control. Readers will learn about system stability and stabilization through an intuitive explanation of the Lyapunov energy function and its connection to LMI formulations. The core content addresses major control design problems for both continuous-time and discrete-time linear time-invariant (LTI) systems. Additionally, extensions to output feedback and linear parameter-varying (LPV) control are discussed. The theoretical foundations are complemented by practical, challenging design problems that highlight the real-world applicability of LMIs through experimental implementation on platforms such as a 3-DOF helicopter and an active suspension system. Robust and Optimal Controller Design via Linear Matrix Inequalities provides a well-structured learning experience, empowering a new generation of students, practicing engineers, and researchers to confidently adopt and apply LMIs in both academic and industrial control applications.



90,94 €
84,99 € (zzgl. MwSt.)

vorbestellbar, Erscheinungstermin ca.
Dezember 2026

Artikelnummer: 9783032204776
Medium: Buch
ISBN: 978-3-032-20477-6
Verlag: Springer
Erscheinungstermin: 10.12.2026
Sprache(n): Englisch
Auflage: Erscheinungsjahr 2026
Produktform: Gebunden
Seiten: 262
Format (B x H): 155 x 235 mm

