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"This authoritative treatment covers theory, optimal estimation and a range of practical applications. The first book on the subject, and written by leading researchers, this clear and rigorous work presents a comprehensive theory for both the stability boundary and the stability regions of a range of nonlinear dynamical systems including continuous, discrete, complex, two-time-scale and non-hyperbolic systems, illustrated with numerical examples. The authors also propose new concepts of quasi-stability region and of relevant stability regions and their complete characterisations. Optimal schemes for estimating stability regions of general nonlinear dynamical systems are also covered, and finally the authors describe and explain how the theory is applied in applications including direct methods for power system transient stability analysis, nonlinear optimisation for finding a set of high-quality optimal solutions, stabilisation of nonlinear systems, ecosystem dynamics, and immunisation problems"--

"This authoritative treatment covers theory, optimal estimation and a range of practical applications. The first book on the subject, and written by leading researchers, this clear and rigorous work presents a comprehensive theory for both the stability boundary and the stability regions of a range of nonlinear dynamical systems including continuous, discrete, complex, two-time-scale and non-hyperbolic systems, illustrated with numerical examples. The authors also propose new concepts of quasi-stability region and of relevant stability regions and their complete characterisations. Optimal schemes for estimating stability regions of general nonlinear dynamical systems are also covered, and finally the authors describe and explain how the

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An authoritative treatment by leading researchers covering theory and optimal estimation, along with practical applications.

This authoritative treatment covers theory, optimal estimation and a range of practical applications. The first book on the subject, and written by leading researchers, this clear and rigorous work presents a comprehensive theory for both the stability boundary and the stability regions of a range of nonlinear dynamical systems including continuous, discrete, complex, two-time-scale and non-hyperbolic systems, illustrated with numerical examples. The authors also propose new concepts of quasi-stability region and of relevant stability regions and their complete characterisations. Optimal schemes for estimating stability regions of general nonlinear dynamical systems are also covered, and finally the authors describe and explain how the theory is applied in applications including direct methods for power system transient stability analysis, nonlinear optimisation for finding a set of high-quality optimal solutions, stabilisation of nonlinear systems, ecosystem dynamics, and immunisation problems.

The book presents nonlinear, chaotic and fractional dynamics, complex systems and networks, together with cutting-edge research on related topics. The fifteen chapters - written by leading scientists working in the areas of nonlinear, chaotic, and fractional dynamics, as well as complex systems and networks - offer an extensive overview of cutting-edge research on a range of topics, including fundamental and applied research. These include but are not limited to, aspects of synchronization in complex dynamical systems, universality features in systems with specific fractional dynamics, and chaotic scattering. As such, the book provides an excellent and timely snapshot of the current state of research, blending the insights and experiences of many prominent researchers.

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