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Lyapunov Inequalities and Applications

- Provides a comprehensive, neatly organized survey on Lyapunov-type inequalities
- Covers applications of Lyapunov-type inequalities in boundary value problems, systems of differential equations, PDEs, dynamic equations, and more
- Puts together content of direct relevance to advanced students in many areas of mathematical and physical sciences

This book provides an extensive survey on Lyapunov-type inequalities. It summarizes and puts order into a vast literature available on the subject, and sketches recent developments in this topic. In an elegant and didactic way, this work presents the concepts underlying Lyapunov-type inequalities, covering how they developed and what kind of problems they address. This survey starts by introducing basic applications of Lyapunov's inequalities. It then advances towards even-order, odd-order, and higher-order boundary value problems; Lyapunov and Hartman-type inequalities; systems of linear, nonlinear, and quasi-linear differential equations; recent developments in Lyapunov-type inequalities; partial differential equations; linear difference equations; and Lyapunov-type inequalities for linear, half-linear, and nonlinear dynamic equations on time scales, as well as linear Hamiltonian dynamic systems. Senior undergraduate students and graduate students of mathematics, engineering, and science will benefit most from this book, as well as researchers in the areas of ordinary differential equations, partial differential equations, difference equations, and dynamic equations. Some background in calculus, ordinary and partial differential equations, and difference equations is recommended for full enjoyment of the content.

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