

Strongly stabilizable distributed parameter systems

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Abstrak

Questions about stability arise in almost every control problem. There are many physical problems in which exponential stability is too strong and for which the concept of strong stability is appropriate. This book provides a solid mathematical framework for a structured approach to strongly stabilizable systems through integration of fundamental theory, physical applications, and numerical results. The author includes a mathematical framework for studying PDE models of large flexible structures, an important class of applications.

The author's structured approach focuses on two themes: the development of system theoretic results for strongly stable systems, and the formulation of these results for a class of dissipative systems with collocated actuators and sensors. The tools set forth in this book extend the scope of applicability of PDE control techniques, including the important aspect of numerical approximation. Most importantly, the author justifies all theory by providing physical examples for which the theory is relevant.

The book encompasses basic system theoretic notions, such as stability, stabilizability, detectability, coprime factorizations, and control related topics like Riccati equations, LQ optimal control, robust stabilization, nonlinear perturbations, and numerical approximation.