

Modelling Robustness, Sensitivity Reduction in Control Systems (Nato a S I Series Series III, Computer and Systems Sciences)



Historically, one of the basic issues in control systems design has been robustness: the ability of a controlled plant to withstand variations in or lack of knowledge of its dynamics. Even if the dynamics of a system are accurately known for purposes of implementation, it is often desirable to design a control system based on a simplified model. Consequently it is essential to be able to guarantee a reasonable performance not only for the nominal plant, but also for its neighbouring perturbations: this is the issue of robustness. Since the beginning of this decade major advances have been made in this area, notably using the H^∞ -approach; this term is meant to cover the solution of sensitivity reduction, approximation and model reduction, robustness and related control design problems using the mathematics of Hardy spaces and related areas in Harmonic Analysis. This book contains the proceedings of the NATO Advanced Research Workshop on Modelling, Robustness and Sensitivity Reduction in Control Systems, which was held at the University of Groningen, December 1986. Its aim was to explore the development of H^∞ -design techniques and its ramifications in Systems Theory in a unified and systematic way with the emphasis on recent advances and future directions in this fast developing area. In particular the following inter-related aspects were addressed: H^∞ -mathematical foundations, model approximation and robustness in control design, optimal sensitivity reduction, modelling and system identification and signal processing.

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