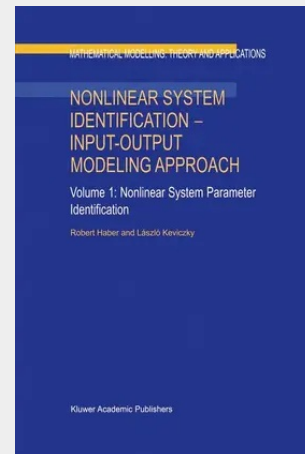


Nonlinear System Identification - Input-Output Modeling Approach

Volume 1: Nonlinear System Parameter Identification

The subject of the book is to present the modeling, parameter estimation and other aspects of the identification of nonlinear dynamic systems. The treatment is restricted to the input-output modeling approach. Because of the widespread usage of digital computers discrete time methods are preferred. Time domain parameter estimation methods are dealt with in detail, frequency domain and power spectrum procedures are described shortly. The theory is presented from the engineering point of view, and a large number of examples of case studies on the modeling and identifications of real processes illustrate the methods. Almost all processes are nonlinear if they are considered not merely in a small vicinity of the working point. To exploit industrial equipment as much as possible, mathematical models are needed which describe the global nonlinear behavior of the process. If the process is unknown, or if the describing equations are too complex, the structure and the parameters can be determined experimentally, which is the task of identification. The book is divided into seven chapters dealing with the following topics: 1. Nonlinear dynamic process models 2. Test signals for identification 3. Parameter estimation methods 4. Nonlinearity test methods 5. Structure identification 6. Model validity tests 7. Case studies on identification of real processes Chapter I summarizes the different model descriptions of nonlinear dynamical systems.

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