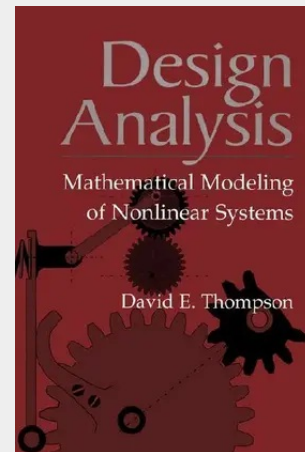


Design Analysis

Mathematical Modeling of Nonlinear Systems

An integral part of engineering design is the development of models that describe physical behavior or phenomena in mathematical terms. As engineering systems have become more complex, classic linear methods of modeling and analysis have proved inadequate, creating a need for nonlinear models to solve design problems. This 1999 text provides an introduction to mathematical modeling of linear and nonlinear systems, with an emphasis on the solution of nonlinear design problems. While encouraging the use of the computer as a tool for modeling and analysis, the aim is to discuss the basic concepts underlying computer techniques and to seek analytical solutions. Among topics covered are exact solution, numerical solution, graphical solution, and approximate solution methods; and the stability of nonlinear systems. Numerous examples show how to apply modeling methods to real engineering systems. The book also includes end-of-chapter problems and case studies of challenging design problems. Intended for advanced undergraduate or beginning graduate students, this text will also serve as a helpful reference for practising engineers.

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