<<智能结构装置及结构电子系统设计>>

图书基本信息

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内容概要

邹鸿生、岳洪浩主编的《智能结构装置设计及结构电子系统》系统地介绍了智能结构、装置和结构电子系统设计的基础理论和技术领域的应用特点和设计方法。
《智能结构装置设计及结构电子系统》可作为高年级本科生及研究生的教材或学习参考书，也可作为相关领域研究人员的参考书。

书籍目录

章节摘录

版权页： 插图： The concepts of smart,intelligent,and adaptive materials and structures originated in the mid-1980s in an attempt to describe the newly emerging research area of integrating electro-activefunctional materials into large-scale structures as in-situ sensors and actuators.Previously.electroactive materials had only been used in small and micro-scale transducers and precision mechatronic(mechanical+electronic)control systems.The general perception of smart,intelligent,andadaptive materials or structures implies an ability to be clever,sharp,active,fashionable,andsophisticated.However, in reality, materials or structures can never achieve true intelligence orreasoning without the addition of artificial intelligence through computers,microprocessors,controllogic,and control algorithms.Accordingly.the materials can only be active and the structures couldultimately be intelligent.Furthermore,the synergistic integration of smart materials,structures,sensors,actuators,and control electronics has redefined the concept of structures from aconventional passive elastic system to an active or adaptive（life-like） multi-functional structronic(structure+electronic)system with inherent self-sensing,diagnosis,and control capabilities[1-4].Thus,the goal of this paper is to review the fundamental characteristics,design principles,andpractical applications of key smart materials as outlined in TAB 1.1.The smart materials examinedinclude piezoelectrics,shape memory materials,electrostrictive materials,magnetostrictivematerials,electrorheological fluids,magnetorhe0109ical fluids,polyelectrolyte gels,pyroelectrics,photostrictive materials,photoferroelectric materials, magneto-optical materials, andsuperconducting materials.The requirements for multi-field opto-thermo-electro-magneto-mechanicalsystems applied to complicated multi-field control problems coupling elastic,temperature,electric,magnetic,and light interactions are also discussed.

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