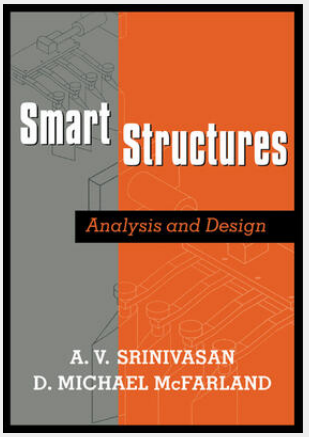
McFarland / Srinivasan / Stinivasan

Smart Structures

Smart structures and structural components have unusual abilities: they can sense a change in temperature, pressure, or strain; diagnose a problem; and initiate an appropriate action in order to preserve structural integrity and continue to perform their intended functions. Smart structures can also store processes in memory and learn to repeat the actions taken. Among the many applications are aircraft sensors that warn of impending cracks and medical devices that monitor blood sugar and deliver insulin. This text provides the basic information needed to analyze and design smart devices and structures. Among topics covered are piezoelectric crystals, shape memory alloys, electrorheological fluids, vibration absorbers, fiber optics, and mistuning. A final chapter offers an intriguing view of biomimetics and design strategies that can be incorporated at the microstructural level deriving inspiration from biological structures. The design of smart structures is at the cutting edge of engineering research and development, and there is a great need for an introductory book on the subject. This book will be welcomed by both students and practising engineers.



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