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Health Monitoring Of Aerospace Structures: Smart Sensor Technologies And Signal Processing



Synopsis

Providing quality research for the reader, this title encompasses all the recent developments in smart sensor technology for health monitoring in aerospace structures, providing a valuable introduction to damage detection techniques. Focussing on engineering applications, all chapters are written by smart structures and materials experts from aerospace manufacturers and research/academic institutions. This key reference: Discusses the most important aspects related to smart technologies for damage detection; this includes not only monitoring techniques but also aspects related to specifications, design parameters, assessment and qualification routes. Presents real case studies and applications; this includes in-flight tests; the work presented goes far beyond academic research applications. Displays a balance between theoretical developments and engineering applications

Book Information

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Customer Reviews

"...very relevant and timely...strongly recommend this multidisciplinary book...an integrated volume of real value..." (Measurement and Control, Vol 37(5), June 2004)

Aerospace structures are currently inspected using traditional non-destructive techniques. However, in recent years the application of a range of different technologies and sensing techniques have advanced damage detection in metallic and composite materials. New developments are capable of

allowing continuous monitoring as well as integrated and on-line damage detection systems for aircraft maintenance. These technologies are attractive to manufacturers and operators of civil and military aircraft for their reduced life cycle costs, reduced inspection/maintenance effort, improved high rate operator availability, extended life of structures and improved safety. These factors all lead to more efficient aircraft. Written by industrial and academic experts in the field, this book brings together recent developments in sensor technologies, damage detection techniques and signal processing procedures for health and usage monitoring of aerospace structures. Health Monitoring of Aerospace Structure: Is the first book fully dedicated to health monitoring of aerospace structures using recent advancements in smart sensor technologies and signal processing. Discusses how new technologies need to be developed for efficient and reliable damage monitoring systems in aircraft. Demonstrates the feasibility of smart technologies for health and usage monitoring of aerospace structures. Covers numerous aspects related to end-user requirements, specifications and design parameters. Presents real case studies and applications including in-flight tests. A truly multidisciplinary book, Health Monitoring of Aerospace Structures is essential reading for academic and industrial researchers, post-graduate students, aircraft designers, manufacturers, end-users and maintenance providers. This book will also appeal to many working on structural health monitoring and smart structures in other fields such as civil engineering and ground and sea transportation.

Even though I bought this book back when it was fresh of the printing press, and payed the price for it, I am still glad I bought it. Now with a much more sensible price tag, this is a great book for people, especially students who are or want to do research in this or related area. As an edited collection of research by the editors and others, it has over two hundred references, and gives you nothing but relevant information from them. The first two chapters of the book, the introduction, and "Aircraft Structural Health and Usage Monitoring" give all the relevant background information you would require if you were just starting or studying in the area. Next the book gives a concise overview of "Operational Load Monitoring Using Optical Fibre [strain] Sensors." The chapter give an insight into current optical fiber strain sensing implementations and methods of Structural Health Monitoring (SHM). Following this is a chapter dedicated to SHM with ultrasonic waves. The chapter is predominantly based on detecting acoustic signals with piezoelectric transducers. The next chapter is on of the most useful, especially for those going from NDE to SHM, which is "Signal Processing". Ideally, the section could have been longer, with an important topic such as wavelet analysis being summarised in a couple of pages. To off set this, the section has the largest number of references,

so additional material can be easily located. The book concludes with what can be considered case studies which show "Structural Health Monitoring Evaluation Tests." Overall this is a well written reference book that with supplements could be used as a text book. I would say 4.5 but having to choose between 4 and 5, I have to give it a 5, as it is certainly above a 4. Worth the investment. Regards,

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