DESCRIPTION

The use of fibre optic sensors in structural health monitoring has rapidly accelerated in recent years. By embedding fibre optic sensors in structures (e.g. buildings, bridges and pipelines) it is possible to obtain real time data on structural changes such as stress or strain. Engineers use monitoring data to detect deviations from a structure’s original design performance in order to optimise the operation, repair and maintenance of a structure over time.

_Fibre Optic Methods for Structural Health Monitoring_ is organised as a step-by-step guide to implementing a monitoring system and includes examples of common structures and their most-frequently monitored parameters. This book:

- presents a universal method for static structural health monitoring, using a technique with proven effectiveness in hundreds of applications worldwide;
- discusses a variety of different structures including buildings, bridges, dams, tunnels and pipelines;
- features case studies which describe common problems and offer solutions to those problems;
- provides advice on establishing mechanical parameters to monitor (including deformations, rotations and displacements) and on placing sensors to achieve monitoring objectives;
- identifies methods for interpreting data according to construction material and shows how to apply numerical concepts and formulae to data in order to inform decision making.
Fibre Optic Methods for Structural Health Monitoring is an invaluable reference for practising engineers in the fields of civil, structural and geotechnical engineering. It will also be of interest to academics and undergraduate/graduate students studying civil and structural engineering.

ABOUT THE AUTHOR

Dr. Branko Glišić received his degrees in Civil Engineering and Theoretical Mathematics at University of Belgrade, Serbia, and Ph.D. at the EPFL, Switzerland. His thesis focuses on the development of fiber optic sensors for particular applications, and characterization of concrete at very early age. He was employed at SMARTEC SA, Switzerland, where he was involved in research and engineering at different levels of responsibility in numerous structural health monitoring (SHM) projects. Since February 2009 he has been employed as an Assistant Professor at Department of Civil and Environmental Engineering of Princeton University. His main areas of interest are SHM methods, advanced sensory systems, smart structures, SHM data management, and sustainable engineering. Prof. Glišić is author and co-author of more than hundred published papers, university course on SHM, short courses on SHM using FOS, and he is a member of several professional associations (ISHMII, ACI, ACSE, IABMAS, IABSE, ISMA).

Dr. Daniele Inaudi received a degree in physics at the Swiss Federal Institute of Technology in Zurich (ETHZ). His graduation work was centred on the theoretical and experimental study of the polarization state of the emission of external grating diode lasers and was prized with the ETHZ medal. He is an active member of OSA, SPIE, IABSE, IABMAS, fib, founding member of ISHMII, chairman of the Sensor conference at the annual “SPIE International Symposium on Smart Structures and Materials” and member of the organizing committee of the annual “International conference on Optical Fibre Sensors”. Daniele Inaudi is author of more that 80 papers, three book chapters and editor of a book on Optical Nondestructive Testing.

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