

BOOK SERIES

RECEIVE 20% OFF: ORDER BEFORE 31 DECEMBER 2010
FROM WWW.CRCPRESS.COM AND ORDER CODE 941GB AT CHECKOUT

Structures & Infrastructures

The scope of this advanced-level Book Series covers the entire spectrum of structures and infrastructures. Topics treated include research, development and application of the most advanced technologies for analyzing, predicting and optimizing the performance of structures and infrastructures, like buildings, bridges, dams, underground construction, offshore platforms, pipelines, naval vessels, ocean structures, nuclear power plants, and also airplanes, aerospace and automotive structures.

Themes featured are mathematical modeling, computer and experimental methods, practical applications in assessment and evaluation, construction and design for durability, decision making, deterioration modeling and aging, failure analysis, field testing, financial planning, inspection and diagnostics, life-cycle analysis and prediction, loads, maintenance strategies, management systems, nondestructive testing, maintenance and management optimization, specifications and codes, structural safety and reliability, system analysis, time-dependent performance, rehabilitation, repair, replacement, reliability and risk management, service life prediction, strengthening and whole life costing.

SERIES EDITOR:
Prof. Dan M. Frangopol

Fazlur R. Khan Endowed Chair
of Structural Engineering and Architecture

Department of Civil and Environmental Engineering

Center for Advanced Technology
for Large Structural Systems (ATLSS)

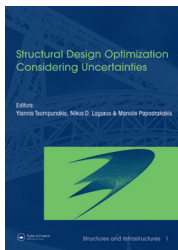
Lehigh University, Bethlehem, PA, USA

dan.frangopol@lehigh.edu

ISSN: 1747-7735

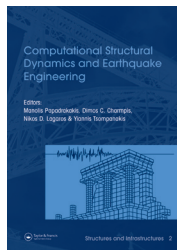
VOLUME 1

ISBN 978-0-415-45260-1



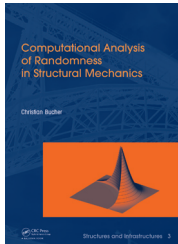
VOLUME 2

ISBN 978-0-415-45261-8



VOLUME 3

COMPUTATIONAL ANALYSIS OF RANDOMNESS IN STRUCTURAL MECHANICS



Christian Bucher, Vienna Univ. of Techn., Austria

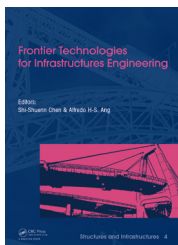
Vol. 3, April 2009: 246x174mm: 248 pp.
HB: ISBN 978-0-415-40354-2,
Price: £63.99 / US\$99.95

This volume details the computational aspects of stochastic analysis within structural mechanics. It presents well-structured chapters on

probability theory and statistics, regression and response surfaces, mechanical vibrations due to random excitations, response analysis of spatially random structures and on the computation of failure probabilities. For graduate students and structural analysts wishing to explore benefits of stochastic analysis.

VOLUME 4

FRONTIER TECHNOLOGIES FOR INFRASTRUCTURE ENGINEERING



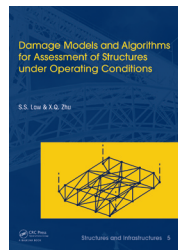
Edited by **Alfredo H.S. Ang**, Univ. California, Irvine, USA and **Shi-Shuenn Chen**, Nat. Taiwan Univ. of Science and Technology, Taipei, Taiwan

Vol. 4, April 2009: 246x174mm: 502 pp.
HB: ISBN 978-0-415-49875-3,
Price: £95.00 / US\$149.95

Expert contributions on frontier technologies in the planning, design, construction, and maintenance of civil infrastructures. This volume covers life-cycle cost and performance, reliability, risk assessment and management, construction management, optimization methods, role of maintenance, inspection, and repair, dynamics and system health monitoring, durability, fatigue and fracture, structural dynamics, corrosion technology for metal and R/C structures and concrete materials and structures.

VOLUME 5

DAMAGE MODELS AND ALGORITHMS FOR ASSESSMENT OF STRUCTURES UNDER OPERATING CONDITIONS



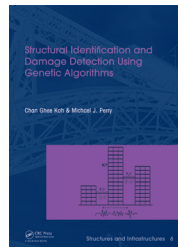
Siu-Seong Law, Hong Kong Polytechnic University, Kowloon, Hong Kong, and **Xin-qun Zhu**, University of Western Australia, Crawley, WA, Australia

Vol. 5, September 2009: 246x174mm: 325 pp. HB: ISBN 978-0-415-42195-9,
Price: £89.00 / US\$139.95

Provides the suitable algorithms to convert collected data in order to gain knowledge of the condition of an infrastructure for maintenance scheduling purposes. Addresses developments in time response series and its derivatives including the wavelet-based impulse response function, also discusses loads on the structure in the conditions assessment. The treatment of uncertainties and the study of their propagation in the inverse problem of structural condition assessment are also discussed.

VOLUME 6

STRUCTURAL IDENTIFICATION AND DAMAGE DETECTION USING GENETIC ALGORITHMS



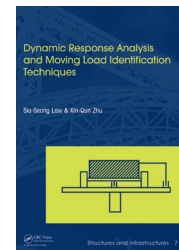
Chan Ghee Koh, National University of Singapore, Singapore, and **Michael John Perry**, National University of Singapore, Singapore

Vol. 6, December 2009: 246x174mm: 164 pp. HB: ISBN 978-0-415-46102-3,
Price: £42.99 / US\$69.95

Presents readers with the background and recent developments required to conduct research and apply GA-based methods for parameter identification, model updating, and damage detection of structural dynamic systems. Demonstrates a novel strategy that focuses on structural identification problems with limited and noise contaminated measurements. Also presents parameter estimation of non-linear structural systems to illustrate the power and versatility of the GA-based identification strategy.

VOLUME 7

DYNAMIC RESPONSE ANALYSIS AND MOVING LOAD IDENTIFICATION TECHNIQUE



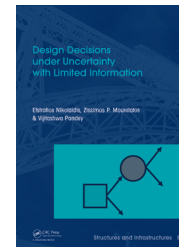
Siu-Seong Law, Hong Kong Polytechnic University, Kowloon, Hong Kong, and **Xin-qun Zhu**, University of Western Australia, Crawley, WA, Australia

Vol. 7, December 2010: 246x174mm: approx. 400 pp.:
HB: ISBN 978-0-415-87877-7,
Price: £95.00 / US\$149.95

This volume treats the fundamentals of moving loads problems with accurate identification and computational efficiency. It presents detailed descriptions of the dynamic behavior of continuous beam, beam-slab type bridge deck and multi-box spline bridge decks under the passage of moving loads. It moreover addresses moving load identification problems with both simple and specialized techniques and treats problems with the practical application of moving load identification techniques.

VOLUME 8

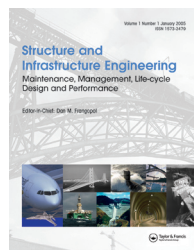
DESIGN DECISIONS UNDER UNCERTAINTY WITH LIMITED INFORMATION



Efstathios Nikolaidis, Univ. of Toledo, OH, USA, **Zissimos P. Mourelatos**, Oakland Univ., Rochester, MI, USA, **Vijitashwa Pandey**, Univ. of Illinois at U/C, IL, USA

Vol. 8, December 2010: 246x174mm: approx. 400 pp.:
HB: ISBN 978-0-415-49247-8,
Price: £95.00 / US\$149.95

This volume presents important theories for modeling uncertainty and the tools suitable for a design problem. It illustrates how to solve practical design problems in the aerospace and automotive engineering, both with the theoretical foundations and with the application to engineering design. Supported by numerous examples, it gives a structured, risk-based approach for design under uncertainty when limited information is available and shows how to improve the overall performance.



THIS BOOK SERIES IS RELATED TO:

STRUCTURE AND INFRASTRUCTURE ENGINEERING Maintenance, Management, Life-cycle Design and Performance

Editor-in-Chief: **Dan M. Frangopol**, Lehigh University, Bethlehem, PA, USA

Print ISSN 1573-2479 – Online ISSN 1744-8980
Taylor & Francis, 6 issues per year, Vol. 6, 2010

www.informaworld.com/sie

Order through www.crcpress.com. Proposals for new volumes are invited. Please contact us through pub.NL@tandf.co.uk or approach the series editor, dan.frangopol@lehigh.edu

Taylor & Francis
Taylor & Francis Group

CRC Press
Taylor & Francis Group
A BALKEMA BOOK