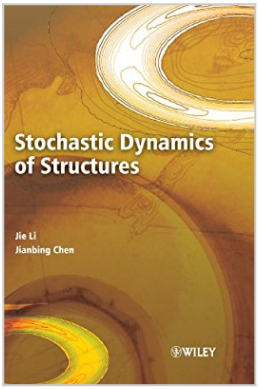

Stochastic Dynamics of Structures

By Jie Li, Jianbing Chen

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In *Stochastic Dynamics of Structures*, Li and Chen present a unified view of the theory and techniques for stochastic dynamics analysis, prediction of reliability, and system control of structures within the innovative theoretical framework of physical stochastic systems. The authors outline the fundamental concepts of random variables, stochastic process and random field, and orthogonal expansion of random functions. Readers will gain insight into core concepts such as stochastic process models for typical dynamic excitations of structures, stochastic finite element, and random vibration analysis. Li and Chen also cover advanced topics, including the theory of and elaborate numerical methods for probability density evolution analysis of stochastic dynamical systems, reliability-based design, and performance control of structures.

Stochastic Dynamics of Structures presents techniques for researchers and graduate students in a wide variety of engineering fields: civil engineering, mechanical engineering, aerospace and aeronautics, marine and offshore engineering, ship engineering, and applied mechanics. Practicing engineers will benefit from the concise review of random vibration theory and the new methods introduced in the later chapters.

"The book is a valuable contribution to the continuing development of the field of stochastic structural dynamics, including the recent discoveries and developments by the authors of the probability density evolution method (PDEM) and its applications to the assessment of the dynamic reliability and control of complex structures through the equivalent extreme-value distribution." —**A. H-S. Ang, NAE, Hon. Mem. ASCE, Research Professor, University of California, Irvine, USA**

"The authors have made a concerted effort to present a responsible and even holistic account of modern stochastic dynamics. Beyond the traditional concepts, they also discuss theoretical tools of recent currency such as the Karhunen-Loeve expansion, evolutionary power spectra, etc. The theoretical developments are properly supplemented by examples from earthquake, wind, and ocean engineering. The book is integrated by also comprising several useful appendices, and an exhaustive list of references; it will be an indispensable tool for students, researchers, and practitioners endeavoring in its thematic field." —**Pol Spanos, NAE, Ryon Chair in Engineering,** Rice University, Houston,

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Editorial Review

From the Back Cover
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Source code for readers and lecture supplements for instructors available at [www.wiley.com/go/stochdyn]

About the Author
Jie Li is a Professor of Civil Engineering at Tongji University, specializing in the area of earthquake engineering and stochastic mechanics. He has worked on uncertainty quantification, response analysis, and reliability evaluation of structural systems involving randomness -- integrating both for system parameters and excitations -- for more than 15 years. He has authored six monographs and published over 200 papers in peer reviewed journals. Li holds executive positions in China's major architectural, vibration engineering, and disaster prevention societies and laboratories. He is the Editor-in-Chief of the Journal of Tongji University (Natural Science Series) and is on the editorial board of over 10 international and Chinese journals, including the *International Journal of Nonlinear Mechanics* and *Earthquake Engineering* and *Engineering Vibrations*. He has received a variety of national and provincial-level awards for Advancement in Science and Technology. Li holds a Ph.D. in Civil Engineering from Tongji University. **Jianbing Chen** is an Associate Professor of Civil Engineering at Tongji University and serves at the State Key Laboratory in Disaster Reduction in Civil Engineering. He specializes in earthquake engineering and stochastic mechanics.

Awards include the MOE's National Science Award, National Excellent Doctoral Thesis, Shanghai City's Excellent Young Teacher Award, and acceptance into the MOE's Excellent Scholars Program. He holds a B.S. from Northeastern University and a Ph.D. from Tongji University, both in Civil Engineering.

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