DESCRIPTION

A timely update of the classic book on the theory and application of random data analysis

First published in 1971, *Random Data* served as an authoritative book on the analysis of experimental physical data for engineering and scientific applications. This *Fourth Edition* features coverage of new developments in random data management and analysis procedures that are applicable to a broad range of applied fields, from the aerospace and automotive industries to oceanographic and biomedical research.

This new edition continues to maintain a balance of classic theory and novel techniques. The authors expand on the treatment of random data analysis theory, including derivations of key relationships in probability and random process theory. The book remains unique in its practical treatment of nonstationary data analysis and nonlinear system analysis, presenting the latest techniques on modern data acquisition, storage, conversion, and qualification of random data prior to its digital analysis. The Fourth Edition also includes:

- A new chapter on frequency domain techniques to model and identify nonlinear systems from measured input/output random data
- New material on the analysis of multiple-input/single-output linear models
- The latest recommended methods for data acquisition and processing of random data
- Important mathematical formulas to design experiments and evaluate results of random data analysis and measurement procedures
• Answers to the problem in each chapter

Comprehensive and self-contained, *Random Data, Fourth Edition* is an indispensible book for courses on random data analysis theory and applications at the upper-undergraduate and graduate level. It is also an insightful reference for engineers and scientists who use statistical methods to investigate and solve problems with dynamic data.

### ABOUT THE AUTHOR

**JULIUS S. BENDAT, PhD,** is President of the J. S. Bendat Company, an independent mathematical consulting firm in Los Angeles, California. An internationally recognized authority in the field, Dr. Bendat has over fifty years of consulting experience in the formulation of mathematical models, the development of statistical error analysis criteria, and the interpretation of engineering results. He is the author of *Nonlinear System Techniques and Applications* and coauthor of *Engineering Applications of Correlation and Spectral Analysis, Second Edition,* both published by Wiley.

The late **ALLAN G. PIERSOL, PE,** was president of Piersol Engineering Company. His consulting career spanned over fifty years and focused on a wide range of topics including the development of machinery condition monitoring techniques and the statistical analysis of all types of mechanical shock, vibration, and acoustic data. A Fellow of the Acoustical Society of America and the Institute of Environmental Sciences and Technology, Piersol is the coauthor of *Engineering Applications of Correlation and Spectral Analysis, Second Edition.*

### NEW TO EDITION

• New examples with solutions in the text and 10 problems at the end of each chapter. Answers are provided for the first time in the Appendix

• A new chapter on frequency domain techniques

• New material on the analysis of multiple-input/multiple-output linear models, laser vibrometers, wireless (telemetry) standards, sigma-delta analog-to-digital converters

• A complete rewrite of the material on Fast Fourier Transforms (FFTs)

• The latest methods for data acquisition and processing and nonstationary data analysis
FEATURES

• Updated discussion of transducers

• Numerous new examples and problem sets

• Complete solutions to all chapter exercises

• Additional techniques on modern digital data storage, oversampling, and temporal moments

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