
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.

Contents:

Preface


Glossary of Symbols.

1 Basic Descriptions and Properties.

1.1 Deterministic Versus Random Data.

1.2 Classifications of Deterministic Data.

1.3 Classifications of Random Data.

1.4 Analysis of Random Data.

2 Linear Physical Systems.

2.1 Constant-Parameter Linear Systems.

2.2 Basic Dynamic Characteristics.

2.3 Frequency Response Functions.

2.4 Illustrations of Frequency Response Functions.

2.5 Practical Considerations.
8.3 Probability Density Function Estimates.
8.4 Correlation Function Estimates.
8.5 Autospectral Density Function Estimates.
8.6 Record Length Requirements.
9 Statistical Errors in Advanced Estimates.
9.3 Multiple-Input/Output Model Estimates.
10 Data Acquisition and Processing.
10.1 Data Acquisition.
10.2 Data Conversion.
10.3 Data Qualification.
10.4 Data Analysis Procedures.
11 Data Analysis.
11.1 Data Preparation.
11.2 Fourier Series and Fast Fourier Transforms.
11.3 Probability Density Functions.
11.4 Autocorrelation Functions.
11.5 Autospectral Density Functions.
11.6 Joint Record Functions.
11.7 Multiple-Input/Output Functions.
12 Nonstationary Data Analysis.
12.1 Classes of Nonstationary Data.
12.2 Probability Structure of Nonstationary Data.
12.3 Nonstationary Mean Values.
12.4 Nonstationary Mean Square Values.
12.5 Correlation Structure of Nonstationary Data.
12.6 Spectral Structure of Nonstationary Data.
12.7 Input/Output Relations for Nonstationary Data.
13 The Hilbert Transform.
13.1 Hilbert Transforms for General Records.
13.2 Hilbert Transforms for Correlation Functions.
13.3 Envelope Detection Followed by Correlation.

14 Nonlinear System Analysis.

14.1 Zero-Memory and Finite-Memory Nonlinear Systems.


14.3 Volterra Nonlinear Models.

14.4 SI/SO Models with Parallel Linear and Nonlinear Systems.

14.5 SI/SO Models with Nonlinear Feedback.

14.6 Recommended Nonlinear Models and Techniques.

14.7 Duffing SDOF Nonlinear System.

14.8 Nonlinear Drift Force Model.

Bibliography.

Appendix A: Statistical Tables.

Appendix B: Definitions for Random Data Analysis.

List of Figures.

List of Tables.

List of Examples.

Answers to Problems in Random Data.

Index.
Fax Order Form
To place an order via fax simply print this form, fill in the information below and fax the completed form to 646-607-1907 (from USA) or +353-1-481-1716 (from Rest of World). If you have any questions please visit http://www.researchandmarkets.com/contact/

Order Information
Please verify that the product information is correct.

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Address:</td>
<td><a href="http://www.researchandmarkets.com/reports/2174852/">http://www.researchandmarkets.com/reports/2174852/</a></td>
</tr>
<tr>
<td>Office Code:</td>
<td>SCAYNBRC</td>
</tr>
</tbody>
</table>

Product Format
Please select the product format and quantity you require:

| Quantity | Hard Copy (Hard Back) | USD 179 + USD 28 Shipping/Handling |

* Shipping/Handling is only charged once per order.

Contact Information
Please enter all the information below in BLOCK CAPITALS

<table>
<thead>
<tr>
<th>Title:</th>
<th>Mr ☐ Mrs ☐ Dr ☐ Miss ☐ Ms ☐ Prof ☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name:</td>
<td>_______________________________</td>
</tr>
<tr>
<td>Last Name:</td>
<td>_______________________________</td>
</tr>
<tr>
<td>Email Address: *</td>
<td>_______________________________</td>
</tr>
<tr>
<td>Job Title:</td>
<td>_______________________________</td>
</tr>
<tr>
<td>Organisation:</td>
<td>_______________________________</td>
</tr>
<tr>
<td>Address:</td>
<td>_______________________________</td>
</tr>
<tr>
<td>City:</td>
<td>_______________________________</td>
</tr>
<tr>
<td>Postal / Zip Code:</td>
<td>_______________________________</td>
</tr>
<tr>
<td>Country:</td>
<td>_______________________________</td>
</tr>
<tr>
<td>Phone Number:</td>
<td>_______________________________</td>
</tr>
<tr>
<td>Fax Number:</td>
<td>_______________________________</td>
</tr>
</tbody>
</table>

* Please refrain from using free email accounts when ordering (e.g. Yahoo, Hotmail, AOL)
Payment Information

Please indicate the payment method you would like to use by selecting the appropriate box.

☐ Pay by credit card: You will receive an email with a link to a secure webpage to enter your credit card details.

☐ Pay by check: Please post the check, accompanied by this form, to:
Research and Markets,
Guinness Center,
Taylors Lane,
Dublin 8,
Ireland.

☐ Pay by wire transfer: Please transfer funds to:
Account number 833 130 83
Sort code 98-53-30
Swift code ULSBIE2D
IBAN number IE78ULSB98533083313083
Bank Address Ulster Bank,
27-35 Main Street,
Blackrock,
Co. Dublin,
Ireland.

If you have a Marketing Code please enter it below:

Marketing Code: ________________________________

Please note that by ordering from Research and Markets you are agreeing to our Terms and Conditions at http://www.researchandmarkets.com/info/terms.asp