

Springer Handbook of Engineering Statistics, Edited by Hoang Pham. Springer-Verlag, London Limited. 2006, ISBN 13: 978-1-185233-806-0, 1120pp. with CD-ROM.

Statistics is the science of applying Probability to the inference and estimating the underline properties of a population. And the Engineering Statistics is the application of the Statistics in the field of engineering. This book is a compilation of 54 articles to showcase how the Statistics are being applied in the diverse fields of engineering.

Since this book enlisted 100 authors in various field of expertise, you can expect the style of writing and depth of the coverage is varying widely. Some are introductory, such as the introduction of basic statistical concepts, reliability, Six Sigma applications; some are in depth expository in a specific topic, such as, Uniform Design, Genomics, Risks and Assets Pricing, and Data Mining. Current research topics in the applying Statistics in the process improvement also included. Almost one quarter of the chapters (13) is directly or indirectly related to the topics of reliability. Since the field of the applications in this book is vast, which ranges from traditional reliability engineering to the fringe of financial applications, the book is distributed in six groups of chapters for easy references. Appendix at the end lists the groups' titles and chapter topics included in each of the group.

This is a book for those who are interested in learning what can you do with the Statistics to develop data, model, or method to discover the information for the purpose of improving the process, making the engineering decisions, or just to understand the process. For those who are applying Statistics for process improvement, this book serves as a good source to go beyond the traditional Six Sigma tool kits.

Appendix : Book content in 6 parts and the list of chapters included in each part :

A. Fundamental Statistics and Its Applications

1. Basic Statistical Concepts, 2. Statistical Reliability with Applications, 3. Weibull Distributions and Their Applications, 4. Characterizations of Probability Distributions, 5. Two-Dimensional Failure Modeling, 6. Prediction intervals for Reliability Growth Models with Small Sample Sizes. 7. Promotional Warranty Policies: Analysis and Perspectives, 8. Stationary Marked Pointed Processes, 9. Modeling and Analyzing Yield, Burn-In and Reliability for Semiconductor Manufacturing: Overview.

B. Process Monitoring and Improvement

10. Statistical Methods for Quality and Productivity Improvement, 11. Statistical Methods for Product and Process Improvement, 12. Robust Optimization in Quality Engineering, 13. Uniform Design and Its Industrial Applications, 14. Cuscore Statistics: Directed Process Monitoring for Early Problem Detection, 15. Chain Sampling, 16. Some Statistical Models for the Monitoring of High-Quality Processes, 17. Monitoring Process Variability Using EWMA, 18. Multivariate Statistical Process Control Schemes for Controlling a Mean.

- C. Reliability Models and Survival Analysis
 - 19. Statistical Survival Analysis with Applications, 20. Failure Rates in Heterogeneous Populations, 21. Proportional Hazards Regression Models, 22. Accelerated Life Test Models and Data Analysis, 23. Statistical Applications to Planning of Accelerated Reliability, 24. End-to-End (E2E) Testing and Evaluation of High-Assurance, 25. Statistical Models in Software Reliability and Operations Research, 26. An Experimental Study of Human Factors in Software Reliability Based on a Quality Engineering Approach, 27. Statistical models for Predicting Reliability of Software Systems in Random Environments.
- D. Regression Methods and Data Mining
 - 28. Measures of Influence and Sensitivity in Linear Regression, 29. Logistic Regression Tree Analysis, 30. Tree-Based Methods and Their Applications, 31. Image Registration and Unknown Coordinate Systems, 32. Statistical Genetics for Genomic Data Analysis, 33. Statistical Methodologies for Analyzing Genomic Data, 34. Statistical Methods in Proteomics, 35. Radial Basis Functions for Data Mining, 36. Data Mining Methods and Applications.
- E. Modeling and Simulation Analysis
 - 37. Bootstrap, Markov Chain and Estimating Function, 38. Random Effects, 39. Cluster Randomized Trials: Design and Analysis, 40. A Two-Way Semilinear Model for Normalization and Analysis of Microarray Data, 41. Latent Variable Models for Longitudinal Data With Flexible Measurement Schedule, 44. Condition-Based Failure Prediction, 45. Statistical Maintenance Modeling for Complex-Systems, 46. Statistical Models on Maintenance.
- F. Application in Engineering Statistics
 - 47. Risk and Assets Pricing, 48. Statistical Management and Modeling for Demand of Spare Parts, 49. Arithmetic and Geometric Processes, 50. Six Sigma, 51. Multivariate Modeling with Copulas and Engineering Applications, 52. Queuing Theory Applications to Communication Systems: Control of Traffic Flows and Load Balancing, 53. Support Vector Machine for Data Modeling with Software Engineering Applications, 54. Optimal System Design.

Shin Ta Liu
Lynx Systems