Reliability Abstracts and Technical Reviews
Mathematical Theory of Reliability
Automotive, Mechanical and Electrical Engineering
Weibull Models
Applied Reliability Using the Weibull Distribution
Reliability Analysis of Non-electronic Components Using Weibull, Gamma, and Log Normal Distributions
Statistical Models and Methods for Lifetime Data
Probability Distributions Used in Reliability Engineering
Recurrent Events Data Analysis for Product Repairs, Disease Recurrences, and Other Applications
Mechanical Reliability
Modelling Methods for Statistical Analysis of Reliability and Life Data
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Statistical Methods for Reliability Data
Progressive Censoring
Reliability Engineering
System Reliability
General Statistical Procedures: Parameter Estimation Using Weibull Distribution, Reliability Test of Hypothesis, and Computation of Expected Number of Renewals
Mathematical and Statistical Methods in Reliability
Reliability and Life Testing
Handbook: Reliability Analysis of Structures with Weibull Distributions of Load and Strength to a Given Confidence Level
Reliability Modelling and Analysis in Discrete Time
Statistical Analysis of Reliability Data
Generalized Weibull Distributions
Recent Advances in Reliability and Quality in Design
Reliability inference for products of Weibull distribution by using artificial neural network formal description
Reliability Analysis of Structural Ceramic Components Using a Three-parameter Weibull Distribution
The Weibull Analysis Handbook
Reliability Inference for Products of Weibull Distribution by Using Artificial Neural Network Formal Description
The Weibull Distribution
Reliability Analysis with Minitab
Re-engineering Manufacturing for Sustainability
Springer Handbook of Engineering Statistics
Frontiers in Reliability
The New Weibull Handbook

A two-parameter Weibull family was assumed to describe durability failures. The test results were used to estimate the two parameters for each subsystem: carriage, recoil system, tube, and breech. This was followed by a test of hypothesis which tested whether sufficient information was available to reject the hypothesis that the required durability had been obtained. The subsystem durability was then used to compute replacement requirements over the system lifetime.
explanations, multiple examples, and exhaustive coverage of the basic and advanced topics of research in this area, the work gives the reader a thorough understanding of the theory and concepts associated with discrete models and reliability structures. A comprehensive bibliography assists readers who are interested in further research and understanding. Requiring only an introductory understanding of statistics, this book offers valuable insight and coverage for students and researchers in Probability and Statistics, Electrical Engineering, and Reliability/Quality Engineering. The book also includes a comprehensive bibliography to assist readers seeking to delve deeper. Includes a valuable introduction to Reliability Theory before covering advanced topics of research and real-world applications. Features an emphasis on the mathematical theory of reliability modeling. Provides many illustrative examples to foster reader understanding.

Applied Reliability

Using the Weibull Distribution

Reliability Analysis of Non-electronic Components Using Weibull, Gamma, and Log Normal Distributions The 2016 International Conference on Automotive Engineering, Mechanical and Electrical Engineering (AEMEE 2016) was held December 9-11, 2016 in Hong Kong, China. AEMEE 2016 was a platform for presenting excellent results and new challenges facing the fields of automotive, mechanical and electrical engineering. Automotive, Mechanical and Electrical Engineering brings together a wide range of contributions from industry and governmental experts and academics, experienced in engineering, design and research. Papers have been categorized under the following headings: Automotive Engineering and Rail Transit Engineering, Mechanical Engineering, Manufacturing, Process Engineering, Network, Communications and Applied Information Technologies, Technologies in Energy and Power, Cell, Engines, Generators, Electric Vehicles, System Test and Diagnosis, Monitoring and Identification, Video and Image Processing, Applied and Computational Mathematics, Methods, Algorithms and Optimization, Technologies in Electrical and Electronic, Control and Automation, Industrial Production, Manufacturing, Management and Logistics.

Statistical Models and Methods for Lifetime Data

Probability Distributions Used in Reliability Engineering Praise for the First Edition "An indispensable addition to any serious collection on lifetime data analysis and ... a valuable contribution to the statistical literature. Highly recommended ..." -Choice "This is an important book, which will appeal to statisticians working on survival analysis problems." -Biometrics "A thorough, unified treatment of statistical models and methods used in the analysis of lifetime data ... this is a highly competent and agreeable statistical textbook." -Statistics in Medicine The statistical analysis of lifetime or response time data is a key tool in engineering, medicine, and many other scientific and technological areas. This book provides a unified treatment of the models and statistical methods used to analyze lifetime data. Equally useful as a reference for individuals interested in the analysis of lifetime data and as a text for advanced students, Statistical Models and Methods for Lifetime Data, Second Edition provides broad coverage of the area without concentrating on any single field of application. Extensive illustrations and examples are drawn from engineering and the biomedical sciences to provide readers with a clear understanding of key concepts. New and expanded coverage in this edition includes: * Observation schemes for lifetime data * Multiple failure modes * Counting process-martingale tools * Both special lifetime data and general optimization software * Mixture models * Treatment of
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Reliability Modeling And Inference

interval-censored and truncated data * Multivariate lifetimes and event history models * Resampling and simulation methodology

Recurrent Events Data Analysis for Product Repairs, Disease Recurrences, and Other Applications
Reliability is an essential concept in mathematics, computing, research, and all disciplines of engineering, and reliability as a characteristic is, in fact, a probability. Therefore, in this book, the author uses the statistical approach to reliability modelling along with the MINITAB software package to provide a comprehensive treatment of modelling, from the basics through advanced modelling techniques. The book begins by presenting a thorough grounding in the elements of modelling the lifetime of a single, non-repairable unit. Assuming no prior knowledge of the subject, the author includes a guide to all the fundamentals of probability theory, defines the various measures associated with reliability, then describes and discusses the more common lifetime models: the exponential, Weibull, normal, lognormal and gamma distributions. She concludes the groundwork by looking at ways of choosing and fitting the most appropriate model to a given data set, paying particular attention to two critical points: the effect of censored data and estimating lifetimes in the tail of the distribution. The focus then shifts to topics somewhat more difficult: the difference in the analysis of lifetimes for repairable versus non-repairable systems and whether repair truly "renews" the system methods for dealing with system with reliability characteristic specified for more than one component or subsystem the effect of different types of maintenance strategies the analysis of life test data The final chapter provides snapshot introductions to a range of advanced models and presents two case studies that illustrate various ideas from throughout the book.

Mechanical Reliability
Survival data consist of a single event for each population unit, namely, end of life, which is modeled with a life distribution. In contrast, many applications involve repeated-events data, where a unit may accumulate any number of events over time. Examples include the number and cost of repairs of products, the number and treatment costs of recurrent disease episodes in patients, and the number of childbirths to statisticians. This applied book provides practitioners with basic nonparametric methods for such data, particularly the plot of the estimate of the population mean cumulative function (MCF), which yields most of the information sought. Recurrent Events Data Analysis for Product Repairs, Disease Recurrences, and Other Applications is the first book to present a simple, unified theory that includes data on costs or other "values" of discrete events, not just the number of events. It surveys computer programs that calculate and plot the MCF estimate with confidence limits, shows their output, and explains how to interpret such plots. Many such calculations can be easily done with a pocket calculator or spreadsheet program. Also, the book introduces basic Poisson and Cox regression models and parametric models, including homogeneous and nonhomogeneous Poisson processes and renewal processes.

Reliability Modelling
Understand and utilize the latest developments in Weibull inferential methods While the Weibull distribution is widely used in science and engineering, most engineers do not have the necessary statistical training to implement the methodology effectively. Using the Weibull Distribution: Reliability, Modeling, and Inference fills a gap in the current literature on the topic, introducing a self-contained presentation of the probabilistic basis for the methodology while providing powerful techniques for extracting information from data. The author explains the use of the Weibull distribution and its statistical and probabilistic basis, providing a wealth of material that is not available in the current literature. The book
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Reliability Modeling And Inference

begins by outlining the fundamental probability and statistical concepts that serve as a foundation for subsequent topics of coverage, including: • Optimum burn-in, age and block replacement, warranties and renewal theory • Exact inference in Weibull regression • Goodness of fit testing and distinguishing the Weibull from the lognormal • Inference for the Three Parameter Weibull

Throughout the book, a wealth of real-world examples showcases the discussed topics and each chapter concludes with a set of exercises, allowing readers to test their understanding of the presented material. In addition, a related website features the author's own software for implementing the discussed analyses along with a set of modules written in Mathcad®, and additional graphical interface software for performing simulations. With its numerous hands-on examples, exercises, and software applications, Using the Weibull Distribution is an excellent book for courses on quality control and reliability engineering at the upper-undergraduate and graduate levels. The book also serves as a valuable reference for engineers, scientists, and business analysts who gather and interpret data that follows the Weibull distribution.

Methods for Statistical Analysis of Reliability and Life Data

A comprehensive perspective on Weibull models

The literature on Weibull models is vast, disjointed, and scattered across many different journals. Weibull Models is a comprehensive guide that integrates all the different facets of Weibull models in a single volume. This book will be of great help to practitioners in reliability and other disciplines in the context of modeling data sets using Weibull models. For researchers interested in these modeling techniques, exercises at the end of each chapter define potential topics for future research. Organized into seven distinct parts, Weibull Models: Covers model analysis, parameter estimation, model validation, and application Serves as both a handbook and a research monograph. As a handbook, it classifies the different models and presents their properties. As a research monograph, it unifies the literature and presents the results in an integrated manner Intertwines theory and application Focuses on model identification prior to model parameter estimation Discusses the usefulness of the Weibull Probability plot (WPP) in the model selection to model a given data set Highlights the use of Weibull models in reliability theory Filled with in-depth analysis, Weibull Models pulls together the most relevant information on this topic to give everyone from reliability engineers to applied statisticians involved with reliability and survival analysis a clear look at what Weibull models can offer.

Concise Reliability for Engineers

This volume presents recent results in reliability theory by leading experts in the world. It will prove valuable for researchers, and users of reliability theory. It consists of refereed invited papers on a broad spectrum of topics in reliability. The subjects covered include Bayesian reliability, Bayesian reliability modeling, confounding in a series system, DF tests, Edgeworth approximation to reliability, estimation under random censoring, fault tree reduction for reliability, inference about changes in hazard rates, information theory and reliability, mixture experiment, mixture of Weibull distributions, queuing network approach in reliability theory, reliability estimation, reliability modeling, repairable systems, residual life function, software spare allocation systems, stochastic comparisons, stress-strength models, system-based component test plans, and TTT-transform.

Statistics of Extremes

Researchers from the entire world write to figure out their newest results and to contribute new ideas or ways in the field of system reliability and maintenance. Their articles are grouped into four sections: reliability, reliability of electronic devices, power system...
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Reliability Modeling And Inference

reliability and feasibility and maintenance. The book is a valuable tool for professors, students and professionals, with its presentation of issues that may be taken as examples applicable to practical situations. Some examples defining the contents can be highlighted: system reliability analysis based on goal-oriented methodology; reliability design of water-dispensing systems; reliability evaluation of drivetrains for off-highway machines; extending the useful life of asset; network reliability for faster feasibility decision; analysis of standard reliability parameters of technical systems' parts; cannibalisation for improving system reliability; mathematical study on the multiple temperature operational life testing procedure, for electronic industry; reliability prediction of smart maximum power point converter in photovoltaic applications; reliability of die interconnections used in plastic discrete power packages; the effects of mechanical and electrical straining on performances of conventional thick-film resistors; software and hardware development in the electric power system; electric interruptions and loss of supply in power systems; feasibility of autonomous hybrid A C/DC microgrid system; predictive modelling of emergency services in electric power distribution systems; web-based decision-support system in the electric power distribution system; preventive maintenance of a repairable equipment operating in severe environment; and others.

System Reliability Theory This classic text covers order statistics and their exceedances; exact distribution of extremes; the 1st asymptotic distribution; uses of the 1st, 2nd, and 3rd asymptotes; more. 1958 edition. Includes 44 tables and 97 graphs.

The Weibull Distribution

Statistical Methods for Reliability Data In today's global and highly competitive environment, continuous improvement in the processes and products of any field of engineering is essential for survival. This book gathers together the full range of statistical techniques required by engineers from all fields. It will assist them to gain sensible statistical feedback on how their processes or products are functioning and to give them realistic predictions of how these could be improved. The handbook will be essential reading for all engineers and engineering-connected managers who are serious about keeping their methods and products at the cutting edge of quality and competitiveness.

Progressive Censoring This edited volume presents the proceedings of the 20th CIRP LCE Conference, which cover various areas in life cycle engineering such as life cycle design, end-of-life management, manufacturing processes, manufacturing systems, methods and tools for sustainability, social sustainability, supply chain management, remanufacturing, etc.

Using the Weibull Distribution Amstat News asked three review editors to rate their top five favorite books in the September 2003 issue. Statistical Methods for Reliability Data was among those chosen. Bringing statistical methods for reliability testing in line with the computer age This volume presents state-of-the-art, computer-based statistical methods for reliability data analysis and test planning for industrial products. Statistical Methods for Reliability Data updates and improves established techniques as it demonstrates how to apply the new graphical, numerical, or simulation-based methods to a broad range of models encountered in reliability data analysis. It includes methods for planning reliability studies and analyzing degradation data, simulation methods used to complement large-sample asymptotic theory, general likelihood-based methods of handling arbitrarily censored data and truncated data, and more. In this book, engineers and statisticians in industry and academia will
find: A wealth of information and procedures developed to give products a competitive edge. Simple examples of data analysis computed with the S-PLUS system for which a suite of functions and commands is available over the Internet. End-of-chapter, real-data exercise sets. Hundreds of computer graphics illustrating data, results of analyses, and technical concepts. An essential resource for practitioners involved in product reliability and design decisions. Statistical Methods for Reliability Data is also an excellent textbook for on-the-job training courses, and for university courses on applied reliability data analysis at the graduate level. An Instructor's Manual presenting detailed solutions to all the problems in the book is available upon request from the Wiley editorial department.

Reliability Engineering

System Reliability: Reliability analysis using the Weibull, log normal, and gamma distributions for non-electronic components is complicated by non-standardization, small lot sizes, and the interaction between components. The Weibull distribution is useful in the failure analysis of structures, ball bearings, brittle beams, and spin gyros. The log normal distribution is used in the failure analysis of aircraft structures and helicopter blades, while the gamma distribution is useful in failure analysis of aluminum strips. It can also be shown that data for a particular example may be fitted to one or more of the distributions with equal success. (Author).

General Statistical Procedures: Parameter Estimation Using Weibull Distribution, Reliability Test of Hypothesis, and Computation of Expected Number of Renewals: Written for those who have taken a first course in statistical methods, this book takes a modern, computer-oriented approach to describe the statistical techniques used for the assessment of reliability.

Mathematical and Statistical Methods in Reliability: This book contains extended versions of carefully selected and reviewed papers presented at the Third International Conference on Mathematical Methods in Reliability, held in Norway in 2002. It provides an overview of current research activities in reliability theory. The authors are all leading experts in the field. Readership: Graduate students, academics and professionals in probability & statistics, reliability analysis, survival analysis, industrial engineering, software engineering, operations research, and applied mathematics research.

Reliability and Life Testing Handbook: This monograph presents a survey of mathematical models useful in solving reliability problems. It includes a detailed discussion of life distributions corresponding to wearout and their use in determining maintenance policies, and covers important topics such as the theory of increasing (decreasing) failure rate distributions, optimum maintenance policies, and the theory of coherent systems. The emphasis throughout the book is on making minimal assumptions - and only those based on plausible physical considerations - so that the resulting mathematical deductions may be safely made about a large variety of commonly occurring reliability situations. The first part of the book is concerned with component reliability, while the second part covers system reliability, including problems that are as important today as they were in the 1960s. The enduring relevance of the subject of reliability and the continuing demand for a graduate-level book on this topic are the driving forces behind its republication.

Reliability Analysis of Structures with Weibull Distributions of Load and Strength to a Given Confidence Level: This new book offers a guide to the theory and methods of progressive censoring. In many industrial experiments
involving lifetimes of machines or units, experiments have to be terminated early. Progressive Censoring first introduces progressive sampling foundations, and then discusses various properties of progressive samples. The book points out the greater efficiency gained by using this scheme instead of classical right-censoring methods.

Reliability Modelling and Analysis in Discrete Time A guide and reference to product reliability testing, this volume covers various steps from planning and test selection to test procedure and results analysis. It delivers information on a variety of distributions, including the Chi-Square, Exponential, Normal, Lognormal, Weibull, Gamma, and others.

Statistical Analysis of Reliability Data Understand and utilize the latest developments in Weibull inferential methods While the Weibull distribution is widely used in science and engineering, most engineers do not have the necessary statistical training to implement the methodology effectively. Using the Weibull Distribution: Reliability, Modeling, and Inference fills a gap in the current literature on the topic, introducing a self-contained presentation of the probabilistic basis for the methodology while providing powerful techniques for extracting information from data. The author explains the use of the Weibull distribution and its statistical and probabilistic basis, providing a wealth of material that is not available in the current literature. The book begins by outlining the fundamental probability and statistical concepts that serve as a foundation for subsequent topics of coverage, including: • Optimum burn-in, age and block replacement, warranties and renewal theory • Exact inference in Weibull regression • Goodness of fit testing and distinguishing the Weibull from the lognormal • Inference for the Three Parameter Weibull Throughout the book, a wealth of real-world examples showcases the discussed topics and each chapter concludes with a set of exercises, allowing readers to test their understanding of the presented material. In addition, a related website features the author's own software for implementing the discussed analyses along with a set of modules written in Mathcad®, and additional graphical interface software for performing simulations. With its numerous hands-on examples, exercises, and software applications, Using the Weibull Distribution is an excellent book for courses on quality control and reliability engineering at the upper-undergraduate and graduate levels. The book also serves as a valuable reference for engineers, scientists, and business analysts who gather and interpret data that follows the Weibull distribution.

Generalized Weibull Distributions Since the publication of the second edition of Applied Reliability in 1995, the ready availability of inexpensive, powerful statistical software has changed the way statisticians and engineers look at and analyze all kinds of data. Problems in reliability that were once difficult and time consuming even for experts can now be solved with a few well

Recent Advances in Reliability and Quality in Design The book provides details on 22 probability distributions. Each distribution section provides a graphical visualization and formulas for distribution parameters, along with distribution formulas. Common statistics such as moments and percentile formulas are followed by likelihood functions and in many cases the derivation of maximum likelihood estimates. Bayesian non-informative and conjugate priors are provided followed by a discussion on the distribution characteristics and applications in reliability engineering.

Reliability inference for products of Weibull distribution by using artificial neural network formal description The Weibull distribution has been one of the
most cited lifetime distributions in reliability engineering. Over the last
decade, many generalizations and extensions of the Weibull have been proposed
in order to provide more flexibility than the traditional version when it
comes to modeling lifetime data in diverse fields. This book offers an update
on these developments, presenting the essential properties of each model.
Several plots of density and hazard rate functions are also included, and a
brief outline of known application(s) for each model is also given.

Reliability Analysis of Structural Ceramic Components Using a Three-parameter
Weibull Distribution A thoroughly updated and revised look at system
reliability theory Since the first edition of this popular text was published
nearly a decade ago, new standards have changed the focus of reliability
engineering and introduced new concepts and terminology not previously
addressed in the engineering literature. Consequently, the Second Edition of
System Reliability Theory: Models, Statistical Methods, and Applications has
been thoroughly rewritten and updated to meet current standards. To maximize
its value as a pedagogical tool, the Second Edition features: Additional
chapters on reliability of maintained systems and reliability assessment of
safety-critical systems Discussion of basic assessment methods for operational
availability and production regularity New concepts and terminology not
covered in the first edition Revised sequencing of chapters for better
pedagogical structure New problems, examples, and cases for a more applied
focus An accompanying Web site with solutions, overheads, and supplementary
information With its updated practical focus, incorporation of industry
feedback, and many new examples based on real industry problems and data, the
Second Edition of this important text should prove to be more useful than ever
for students, instructors, and researchers alike.

The Weibull Analysis Handbook This book presents the latest theories and
methods of reliability and quality, with emphasis on reliability and quality
in design and modelling. Each chapter is written by active researchers and
professionals with international reputations, providing material which bridges
the gap between theory and practice to trigger new practices and research
challenges. The book therefore provides a state-of-the-art survey of
reliability and quality in design and practices.

Reliability Inference for Products of Weibull Distribution by Using Artificial
Neural Network Formal Description An Integrated Approach to Product
Development Reliability Engineering presents an integrated approach to the
design, engineering, and management of reliability activities throughout the
life cycle of a product, including concept, research and development, design,
manufacturing, assembly, sales, and service. Containing illustrative guides
that include worked problems, numerical examples, homework problems, a
solutions manual, and class-tested materials, it demonstrates to product
development and manufacturing professionals how to distribute key reliability
practices throughout an organization. The authors explain how to integrate
reliability methods and techniques in the Six Sigma process and Design for Six
Sigma (DFSS). They also discuss relationships between warranty and
reliability, as well as legal and liability issues. Other topics covered
include: Reliability engineering in the 21st Century Probability life
distributions for reliability analysis Process control and process capability
Failure modes, mechanisms, and effects analysis Health monitoring and
prognostics Reliability tests and reliability estimation Reliability
Engineering provides a comprehensive list of references on the topics covered
in each chapter. It is an invaluable resource for those interested in gaining
fundamental knowledge of the practical aspects of reliability in design,
manufacturing, and testing. In addition, it is useful for implementation and
management of reliability programs.
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Reliability Modeling And Inference

The Weibull Distribution Statistical Analysis for the Reliability Engineering Professional. Effectively conduct reliability analysis using the world's leading statistical software. Reliability Analysis with Minitab outlines statistical concepts and applications, explains the theory of probability, reliability analysis, and quality improvement, and provides step-by-step instr

Reliability Analysis with Minitab "The CD-ROM also includes solutions to most of the examples in the text in Microsoft Excel templates, a user's guide for the Weibull software, and statistical tables." --Cover.

Re-engineering Manufacturing for Sustainability The Most Comprehensive Book on the Subject Chronicles the Development of the Weibull Distribution in Statistical Theory and Applied Statistics Exploring one of the most important distributions in statistics, The Weibull Distribution: A Handbook focuses on its origin, statistical properties, and related distributions. The book also presents various approaches to estimate the parameters of the Weibull distribution under all possible situations of sampling data as well as approaches to parameter and goodness-of-fit testing. Describes the Statistical Methods, Concepts, Theories, and Applications of This Distribution Compiling findings from dozens of scientific journals and hundreds of research papers, the author first gives a careful and thorough mathematical description of the Weibull distribution and all of its features. He then deals with Weibull analysis, using classical and Bayesian approaches along with graphical and linear maximum likelihood techniques to estimate the three Weibull parameters. The author also explores the inference of Weibull processes, Weibull parameter testing, and different types of goodness-of-fit tests and methods.

Successfully Apply the Weibull Model By using inferential procedures for estimating, testing, forecasting, and simulating data, this self-contained, detailed handbook shows how to solve statistical life science and engineering problems.

Springer Handbook of Engineering Statistics Our life is strongly influenced by the reliability of the things we use, as well as of processes and services. Failures cause losses in the industry and society. Methods for reliability assessment and optimization are thus very important. This book explains the fundamental concepts and tools. It is divided into two parts. Chapters 1 to 10 explain the basic terms and methods for the determination of reliability characteristics, which create the base for any reliability evaluation. In the second part (Chapters 11 to 23) advanced methods are explained, such as Failure Modes and Effects Analysis and Fault Tree Analysis, Load-Resistance interference method, the Monte Carlo simulation technique, cost-based reliability optimization, reliability testing, and methods based on Bayesian approach or fuzzy logic for processing of vague information. The book is written in a readable way and practical examples help to understand the topics. It is complemented with references and a list of standards, software and sources of information on reliability.

Frontiers in Reliability

The New Weibull Handbook The statistical variation of load and strength is described by a three parameter Weibull distribution. The Weibull parameters are evaluated by a least square analysis and a method is presented which allows confidence bounds to be assigned to these quantities. A Monte Carlo analysis is used to calculate the reliability of the structure from the load and strength distributions. (Author).

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