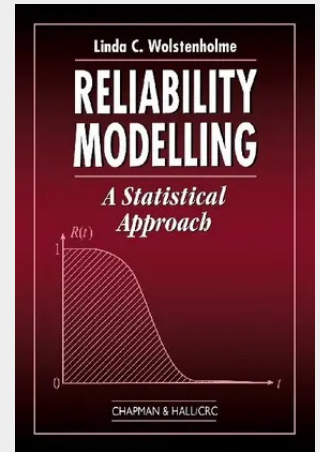


Reliability Modelling

A Statistical Approach

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 MINTAB 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.

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