



# Computational Methods For Reliability And Risk Analysis (Series on Quality, Reliability & Engineering Statistics)

By Enrico Zio

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This book illustrates a number of modelling and computational techniques for addressing relevant issues in reliability and risk analysis. In particular, it provides: i) a basic illustration of some methods used in reliability and risk analysis for modelling the stochastic failure and repair behaviour of systems, e.g. the Markov and Monte Carlo simulation methods; ii) an introduction to Genetic Algorithms, tailored to their application for RAMS (Reliability, Availability, Maintainability and Safety) optimization; iii) an introduction to key issues of system reliability and risk analysis, like dependent failures and importance measures; and iv) a presentation of the issue of uncertainty and of the techniques of sensitivity and uncertainty analysis used in support of reliability and risk analysis. The book provides a technical basis for senior undergraduate or graduate courses and a reference for researchers and practitioners in the field of reliability and risk analysis. Several practical examples are included to demonstrate the application of the concepts and techniques in practice.

Contents: Markov Reliability and Availability Analysis; Monte Carlo Simulations for Reliability and Availability Analysis; Markov Chain Monte Carlo for Applications to Reliability and Availability Analysis; Basics of Genetic Algorithms with Application to System Reliability and Availability Optimization; Dependent Failures; Importance Measures; Basic Concepts of Uncertainty and Sensitivity Analysis.

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