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Nota di contenuto	Reliability and Risk; Contents; Preface; Acknowledgements; 1 Introduction and Overview; 1.1 Preamble: What do 'Reliability', 'Risk' and 'Robustness' Mean?; 1.2 Objectives and Prospective Readership; 1.3 Reliability, Risk and Survival: State-of-the-Art; 1.4 Risk Management: A Motivation for Risk Analysis; 1.5 Books on Reliability, Risk and Survival Analysis; 1.6 Overview of the Book; 2 The Quantification of Uncertainty; 2.1 Uncertain Quantities and Uncertain Events: Their Definition and Codification; 2.2 Probability: A Satisfactory Way to Quantify Uncertainty; 2.2.1 The Rules of Probability 2.2.2 Justifying the Rules of Probability2.3 Overview of the Different Interpretations of Probability; 2.3.1 A Brief History of Probability; 2.3.2 The Different Kinds of Probability; 2.4 Extending the Rules of Probability: Law of Total Probability and Bayes' Law; 2.4.1 Marginalization; 2.4.2 The Law of Total Probability; 2.4.3 Bayes' Law: The Incorporation of Evidence and the Likelihood; 2.5 The Bayesian Paradigm: A Prescription for Reliability, Risk and Survival Analysis; 2.6 Probability Models, Parameters, Inference and Prediction

2.6.1 The Genesis of Probability Models and Their Parameters2.6.2 Statistical Inference and Probabilistic Prediction; 2.7 Testing Hypotheses: Posterior Odds and Bayes Factors; 2.7.1 Bayes Factors: Weight of Evidence and Change in Odds; 2.7.2 Uses of the Bayes Factor; 2.7.3 Alternatives to Bayes Factors; 2.8 Utility as Probability and Maximization of Expected Utility; 2.8.1 Utility as a Probability; 2.8.2 Maximization of Expected Utility; 2.8.3 Attitudes to Risk: The Utility of Money; 2.9 Decision Trees and Influence Diagrams for Risk Analysis; 2.9.1 The Decision Tree
2.9.2 The Influence Diagram3 Exchangeability and Indifference; 3.1 Introduction to Exchangeability: de Finetti's Theorem; 3.1.1 Motivation for the Judgment of Exchangeability; 3.1.2 Relationship between Independence and Exchangeability; 3.1.3 de Finetti's Representation Theorem for Zero-one Exchangeable Sequences; 3.1.4 Exchangeable Sequences and the Law of Large Numbers; 3.2 de Finetti-style Theorems for Infinite Sequences of Non-binary Random Quantities; 3.2.1 Sufficiency and Indifference in Zero-one Exchangeable Sequences 3.2.2 Invariance Conditions Leading to Mixtures of Other Distributions3.3 Error Bounds on de Finetti-style Results for Finite Sequences of Random Quantities; 3.3.1 Bounds for Finitely Extendable Zero-one Random Quantities; 3.3.2 Bounds for Finitely Extendable Non-binary Random Quantities; 4 Stochastic Models of Failure; 4.1 Introduction; 4.2 Preliminaries: Univariate, Multivariate and Multi-indexed Distribution Functions; 4.3 The Predictive Failure Rate Function of a Univariate Probability Distribution; 4.3.1 The Case of Discontinuity 4.4 Interpretation and Uses of the Failure Rate Function - the Model Failure Rate

Sommario/riassunto

We all like to know how reliable and how risky certain situations are, and our increasing reliance on technology has led to the need for more precise assessments than ever before. Such precision has resulted in efforts both to sharpen the notions of risk and reliability, and to quantify them. Quantification is required for normative decision-making, especially decisions pertaining to our safety and wellbeing. Increasingly in recent years Bayesian methods have become key to such quantifications. Reliability and Risk provides a comprehensive overview of the mathematical and statistical