

1. Record Nr.	UNINA9910840749303321
Autore	Parmigiani G (Giovanni)
Titolo	Decision theory [[electronic resource]] : principles and approaches / / Giovanni Parmigiani, Lurdes Y.T. Inoue, Hedibert F. Lopes
Pubbl/distr/stampa	Chichester, West Sussex, : John Wiley & Sons, c2009
ISBN	0-470-74668-8 1-282-13828-6 9786612138287 0-470-74667-X
Edizione	[1st edition]
Descrizione fisica	1 online resource (404 p.)
Collana	Wiley Series in Probability and Statistics ; ; v.812
Altri autori (Persone)	InoueLurdes Y. T <1970-> (Lurdes Yoshiko Tani) LopezHedibert Freitas
Disciplina	519.5 519.5/42 519.542
Soggetti	Statistical decision Axiomatic set theory Experimental design
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Decision Theory; Contents; Preface; Acknowledgments; 1 Introduction; 1.1 Controversies; 1.2 A guided tour of decision theory; Part One Foundations; 2 Coherence; 2.1 The "Dutch Book" theorem; 2.1.1 Betting odds; 2.1.2 Coherence and the axioms of probability; 2.1.3 Coherent conditional probabilities; 2.1.4 The implications of Dutch Book theorems; 2.2 Temporal coherence; 2.3 Scoring rules and the axioms of probabilities; 2.4 Exercises; 3 Utility; 3.1 St. Petersburg paradox; 3.2 Expected utility theory and the theory of means; 3.2.1 Utility and means; 3.2.2 Associative means 3.2.3 Functional means3.3 The expected utility principle; 3.4 The von Neumann-Morgenstern representation theorem; 3.4.1 Axioms; 3.4.2 Representation of preferences via expected utility; 3.5 Allais' criticism; 3.6 Extensions; 3.7 Exercises; 4 Utility in action; 4.1 The "standard gamble"; 4.2 Utility of money; 4.2.1 Certainty equivalents; 4.2.2 Risk aversion; 4.2.3 A measure of risk aversion; 4.3 Utility functions for

medical decisions; 4.3.1 Length and quality of life; 4.3.2 Standard gamble for health states; 4.3.3 The time trade-off methods; 4.3.4 Relation between QALYs and utilities
 4.3.5 Utilities for time in ill health; 4.3.6 Difficulties in assessing utility;
 4.4 Exercises; 5 Ramsey and Savage; 5.1 Ramsey's theory; 5.2 Savage's theory; 5.2.1 Notation and overview; 5.2.2 The sure thing principle; 5.2.3 Conditional and a posteriori preferences; 5.2.4 Subjective probability; 5.2.5 Utility and expected utility; 5.3 Allais revisited; 5.4 Ellsberg paradox; 5.5 Exercises; 6 State independence; 6.1 Horse lotteries; 6.2 State-dependent utilities; 6.3 State-independent utilities; 6.4 Anscombe-Aumann representation theorem; 6.5 Exercises; Part Two Statistical Decision Theory
 7 Decision functions
 7.1 Basic concepts; 7.1.1 The loss function; 7.1.2 Minimax; 7.1.3 Expected utility principle; 7.1.4 Illustrations; 7.2 Data-based decisions; 7.2.1 Risk; 7.2.2 Optimality principles; 7.2.3 Rationality principles and the Likelihood Principle; 7.2.4 Nuisance parameters; 7.3 The travel insurance example; 7.4 Randomized decision rules; 7.5 Classification and hypothesis tests; 7.5.1 Hypothesis testing; 7.5.2 Multiple hypothesis testing; 7.5.3 Classification; 7.6 Estimation; 7.6.1 Point estimation; 7.6.2 Interval inference; 7.7 Minimax-Bayes connections; 7.8 Exercises
 8 Admissibility
 8.1 Admissibility and completeness; 8.2 Admissibility and minimax; 8.3 Admissibility and Bayes; 8.3.1 Proper Bayes rules; 8.3.2 Generalized Bayes rules; 8.4 Complete classes; 8.4.1 Completeness and Bayes; 8.4.2 Sufficiency and the Rao-Blackwell inequality; 8.4.3 The Neyman-Pearson lemma; 8.5 Using the same level across studies with different sample sizes is inadmissible; 8.6 Exercises; 9 Shrinkage; 9.1 The Stein effect; 9.2 Geometric and empirical Bayes heuristics; 9.2.1 Is x too big for ?; 9.2.2 Empirical Bayes shrinkage; 9.3 General shrinkage functions
 9.3.1 Unbiased estimation of the risk of $x + g(x)$

Sommario/riassunto

Decision theory provides a formal framework for making logical choices in the face of uncertainty. Given a set of alternatives, a set of consequences, and a correspondence between those sets, decision theory offers conceptually simple procedures for choice. This book presents an overview of the fundamental concepts and outcomes of rational decision making under uncertainty, highlighting the implications for statistical practice. The authors have developed a series of self contained chapters focusing on bridging the gaps between the different fields that have contributed to rational decision theory.