1. Record Nr. UNINA9910132177003321

Titolo	Bayesian networks for probabilistic inference and decision analysis in forensic science / / Franco Taroni [and four others]
Pubbl/distr/stampa	Chichester, England : , : Wiley, , 2014 ©2014
ISBN	1-118-91476-7 1-118-91475-9
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (473 p.)
Collana	Statistics in Practice
Disciplina	363.2501/519542
Soggetti	Bayesian statistical decision theory - Graphic methods Uncertainty (Information theory) - Graphic methods Forensic sciences - Graphic methods
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 indexes.
Nota di contenuto	Cover; Title Page; Copyright; Contents; Foreword; Preface to the second edition; Preface to the first edition; Chapter 1 The logic of decision; 1.1 Uncertainty and probability; 1.1.1 Probability is not about numbers, it is about coherent reasoning under uncertainty; 1.1.2 The first two laws of probability; 1.1.3 Relevance and independence; 1.1.4 The third law of probability; 1.1.5 Extension of the conversation; 1.1.6 Bayes' theorem; 1.1.7 Probability trees; 1.1.8 Likelihood and probability; 1.1.9 The calculus of (probable) truths; 1.2 Reasoning under uncertainty 1.2.1 The Hound of the Baskervilles1.2.2 Combination of background information and evidence; 1.2.3 The odds form of Bayes' theorem; 1.2.4 Combination of evidence; 1.2.5 Reasoning with total evidence; 1.2.6 Reasoning with uncertain evidence; 1.3 Population proportions, probabilities and induction; 1.3.1 The statistical syllogism; 1.3.2 Expectations and population proportions; 1.3.3 Probabilistic explanations; 1.3.4 Abduction and inference to the best explanation; 1.3.5 Induction the Bayesian way; 1.4 Decision making under uncertainty; 1.4.1 Bookmakers in the Courtrooms?; 1.4.2 Utility theory 1.4.3 The rule of maximizing expected utility1.4.4 The loss function; 1.4.5 Decision trees; 1.4.6 The expected value of information; 1.5

Further readings; Chapter 2 The logic of Bayesian networks and influence diagrams; 2.1 Reasoning with graphical models; 2.1.1 Beyond detective stories; 2.1.2 Bayesian networks; 2.1.3 A graphical model for relevance; 2.1.4 Conditional independence; 2.1.5 Graphical models for conditional independence: d-separation; 2.1.6 A decision rule for conditional independence; 2.1.7 Networks for evidential reasoning; 2.1.8 The Markov property; 2.1.9 Influence diagrams
2.1.10 Conditional independence in influence diagrams2.1.11 Relevance and causality; 2.1.12 The Hound of the Baskervilles revisited; 2.2 Reasoning with Bayesian networks and influence diagrams; 2.2.1 Divide and conquer; 2.2.2 From directed to triangulated graphs; 2.2.3 From triangulated graphs to junction trees; 2.2.4 Solving influence diagrams; 2.2.5 Object-oriented Bayesian networks; 2.2.6 Solving object-oriented Bayesian networks; 2.3 Further readings; 2.3.1 General; 2.3.2 Bayesian networks and their predecessors in judicial contexts Chapter 3 Evaluation of scientific findings in forensic science3.1 Introduction; 3.2 The value of scientific findings; 3.3 Principles of forensic evaluation and relevant propositions; 3.3.1 Source level propositions; 3.3.1.1 Notation; 3.3.1.2 Single stain; 3.3.2 Activity level propositions; 3.3.2.1 Notation and formulaic development; 3.3.3 Crime level propositions; 3.3.3.1 Notation; 3.3.3.2 Association propositions; 3.3.3.3 Intermediate association propositions; 3.4 Pre-assessment of the case; 3.5 Evaluation using graphical models; 3.5.1 Introduction 3.5.2 General aspects of the construction of Bayesian networks

Sommario/riassunto

""This book should have a place on the bookshelf of every forensic scientist who cares about the science of evidence interpretation""Dr. Ian Evett, Principal Forensic Services Ltd, London, UK Continuing developments in science and technology mean that the amounts of information forensic scientists are able to provide for criminal investigations is ever increasing. The commensurate increase in complexity creates difficulties for scientists and lawyers with regard to evaluation and interpretation, notably with respect to issues of inference and decision. Probability t