1. Record Nr. UNINA9910452641603321 Autore Pearl Judea Titolo Causality: models, reasoning, and inference / / Judea Pearl [[electronic resource]] Cambridge:,: Cambridge University Press,, 2000 Pubbl/distr/stampa **ISBN** 1-139-63780-0 1-316-08838-3 1-139-64936-1 0-511-80316-8 1-139-64172-7 1-139-63888-2 1-299-40923-7 1-139-64840-3 Edizione [2nd edition] Descrizione fisica 1 online resource (xvi, 384 pages) : digital, PDF file(s) 122 Disciplina Causation Soggetti **Probabilities** Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Title from publisher's bibliographic system (viewed on 05 Oct 2015). Includes bibliographical references (pages 429-452) and indexes. Nota di bibliografia Nota di contenuto Cover; CAUSALITY: Models, Reasoning, and Inference Second Edition; Series Page: Title: Copyright: Dedication: Contents: Preface to the First Edition; Preface to the Second Edition; CHAPTER ONE Introduction to Probabilities, Graphs, and Causal Models: 1.1 INTRODUCTION TO PROBABILITY THEORY; 1.1.1 Why Probabilities?; 1.1.2 Basic Concepts in Probability Theory; 1.1.3 Combining Predictive and Diagnostic Supports; 1.1.4 Random Variables and Expectations; 1.1.5 Conditional Independence and Graphoids; 1.2 GRAPHS AND PROBABILITIES; 1.2.1 Graphical Notation and Terminology; 1.2.2 Bayesian Networks 1.2.3 The d-Separation Criterion 1.2.4 Inference with Bayesian Networks; 1.3 CAUSAL BAYESIAN NETWORKS; 1.3.1 Causal Networks as Oracles for Interventions; 1.3.2 Causal Relationships and Their Stability; 1.4 FUNCTIONAL CAUSAL MODELS; 1.4.1 Structural Equations; 1.4.2 Probabilistic Predictions in Causal Models; 1.4.3 Interventions and Causal Effects in Functional Models: 1.4.4 Counterfactuals in Functional

Models: 1.5 CAUSAL VERSUS STATISTICAL TERMINOLOGY: Causal versus Statistical Concepts: Two Mental Barriers to Causal Analysis: CHAPTER TWO A Theory of Inferred Causation; Preface 2.1 INTRODUCTION - THE BASIC INTUITIONS 2.2 THE CAUSAL DISCOVERY FRAMEWORK; 2.3 MODEL PREFERENCE (OCCAM'S RAZOR); 2.4 STABLE DISTRIBUTIONS; 2.5 RECOVERING DAG STRUCTURES; 2.6 RECOVERING LATENT STRUCTURES; 2.7 LOCAL CRITERIA FOR INFERRING CAUSAL RELATIONS: 2.8 NONTEMPORAL CAUSATION AND STATISTICAL TIME; 2.9 CONCLUSIONS; 2.9.1 On Minimality, Markov, and Stability; Relation to the Bayesian Approach; Postscript for the Second Edition; CHAPTER THREE Causal Diagrams and the Identification of Causal Effects: Preface: 3.1 INTRODUCTION: 3.2 INTERVENTION IN MARKOVIAN MODELS 3.2.1 Graphs as Models of Interventions 3.2.2 Interventions as Variables: 3.2.3 Computing the Effect of Interventions: An Example: Dynamic Process Control; Summary; 3.2.4 Identification of Causal Quantities; 3.3 CONTROLLING CONFOUNDING BIAS; 3.3.1 The Back-Door Criterion; 3.3.2 The Front-Door Criterion; 3.3.3 Example: Smoking and the Genotype Theory: 3.4 A CALCULUS OF INTERVENTION: 3.4.1 Preliminary Notation; 3.4.2 Inference Rules; 3.4.3 Symbolic Derivation of Causal Effects: An Example; 3.4.4 Causal Inference by Surrogate Experiments; 3.5 GRAPHICAL TESTS OF IDENTIFIABILITY 3.5.1 Identifying Models 3.5.2 Nonidentifying Models; 3.6 DISCUSSION; 3.6.1 Qualifications and Extensions; 3.6.2 Diagrams as a Mathematical Language: 3.6.3 Translation from Graphs to Potential Outcomes: 3.6.4 Relations to Robins's G-Estimation; Personal Remarks and Acknowledgments; Postscript for the Second Edition; Complete identification results; Applications and Critics; Chapter Road Map to the Main Results; CHAPTER FOUR Actions, Plans, and Direct Effects; Preface; 4.1 INTRODUCTION; 4.1.1 Actions, Acts, and Probabilities; 4.1.2 Actions in Decision Analysis: 4.1.3 Actions and Counterfactuals

Sommario/riassunto

Written by one of the preeminent researchers in the field, this book provides a comprehensive exposition of modern analysis of causation. It shows how causality has grown from a nebulous concept into a mathematical theory with significant applications in the fields of statistics, artificial intelligence, economics, philosophy, cognitive science, and the health and social sciences. Judea Pearl presents and unifies the probabilistic, manipulative, counterfactual, and structural approaches to causation and devises simple mathematical tools for studying the relationships between causal connections and statistical associations. Cited in more than 2,100 scientific publications, it continues to liberate scientists from the traditional molds of statistical thinking. In this revised edition, Judea Pearl elucidates thorny issues. answers readers' questions, and offers a panoramic view of recent advances in this field of research. Causality will be of interest to students and professionals in a wide variety of fields. Dr Judea Pearl has received the 2011 Rumelhart Prize for his leading research in Artificial Intelligence (AI) and systems from The Cognitive Science Society.

4.2 CONDITIONAL ACTIONS AND STOCHASTIC POLICIES