

Knowledge And Power The Information Theory Of Capitalism And How It Is Revolutionizing Our World Hardcover

35 Key Concepts in Information Theory Explained in 7 Minutes EachEntropy and Information TheoryElements of Information TheoryA First Course in Information TheoryThe Information Theory Approach to CommunicationsAn Introduction to Information TheoryInformation TheoryInformation TheoryElementary Information TheoryInformation-Spectrum Methods in Information TheoryInformation TheoryTopics in Information TheoryScience and Information TheoryElements of Information TheoryCoding and Information TheoryFormal Theories of InformationThe Information Security DictionaryAristotle and Information TheoryApplied Information TheoryThe Mathematical Theory of Information Nietsnie Trebla Robert M. Gray Thomas M. Cover Raymond W. Yeung Giuseppe Longo John R. Pierce James V. Stone Arie Ben-Naim Douglas Samuel Jones Te Sun Han Robert B. Ash Imre Csiszár Leon Brillouin T. M. Cover Richard Wesley Hamming Giovanni Sommaruga Urs E. Gattiker Lawrence William Rosenfield I. M. Kogan Jan Kahre

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35 key concepts in information theory explained in 7 minutes each in our increasingly interconnected world understanding the fundamentals of information theory is essential for navigating the complexities of communication data analysis and technological advancement 35 key concepts in information theory explained in 7 minutes each serves as an accessible guide designed for both novices and seasoned professionals seeking to grasp the core principles that underpin this vital field each chapter distills a fundamental concept of information theory into a concise digestible format taking no more than seven minutes to read this structured approach enables readers to quickly assimilate knowledge and apply it to real world situations chapters overview the concept of information definition and measurement explore how information is defined and quantified entropy the measure of uncertainty understand the concept of uncertainty and how it relates to information shannon s noisy channel coding theorem learn about the foundational theorem that governs communication in the presence of noise information compression lossless vs lossy discover the techniques behind optimizing data storage and transmission mutual information a measure of shared information dive into the quantification of shared data between systems the role of redundancy in communication systems understand how redundancy can enhance communication reliability channel capacity theoretical limits of transmission examine the upper limits of data transfer rates error correction codes ensuring reliable communication explore methods for correcting errors in data transmission data transmission vs data storage a distinction clarify the differences between these two essential aspects of information handling the source coding theorem optimal data representation learn how to achieve the most efficient data representation applications of information theory in cryptography

investigate how information theory underpins secure communications kolmogorov complexity understanding algorithmic information delve into measuring the complexity of data sets universal sources and the concept of randomness explore the nature of randomness and its implications for information theory the emergence of quantum information theory discover the intersection of quantum mechanics and information science information theory in machine learning and ai understand the foundational role of information theory in developing smart technologies applications in biology biological information and genomes examine how information theory applies to genetics and biological processes the role of information theory in networking learn how information theory shapes modern networking protocols the information bottleneck principle explore how to balance the trade off between complexity and accuracy cross entropy and kl divergence measuring differences understand these important metrics for comparing probability distributions predictive coding the brain as a bayesian machine investigate how the brain processes information through predictive mechanisms the impact of information theory on telecom innovations learn how the field has transformed telecommunications coding theorems in modern satellite communication explore the application of coding theory in satellite technologies information theory and the second law of thermodynamics discover the relationship between information and thermodynamic principles game theory and information strategies under uncertainty analyze how information theory informs strategic decision making influence of information theory on signal processing learn about the significant impact on how signals are analyzed and processed data privacy and information theoretic security examine principles that safeguard data privacy in an interconnected world information theory in digital forensics understand how these concepts apply to forensic investigations adaptive coding and modulation techniques explore modern methods for optimizing data transmission information theoretic essentials in social networks learn how information flows in social media environments the role of information theory in data science delve into the importance of information metrics in data analysis causal inference and the information perspective explore the use of information theory in determining causality information theory and structured prediction investigate how structured predictions can be enhanced by information theory the future of information theory challenges and directions discuss emerging challenges and future research directions in the field philosophical implications of information as a concept reflect on the deeper meanings and impacts of information in society and thought this book acts as a perfect springboard for those looking to deepen their understanding of information theory whether for academic purposes professional development or personal curiosity dive into the world of information with confidence and clarity

this book is devoted to the theory of probabilistic information measures and their application to coding theorems for information sources and noisy channels the eventual goal is a general development of shannon s mathematical theory of communication but much of the space is devoted to the tools and methods required to prove the shannon coding theorems these tools form an area common to ergodic theory and information theory and comprise several quantitative notions of the information in random variables random processes and dynamical systems examples are entropy mutual information conditional entropy conditional information and discrimination or relative entropy along with the limiting normalized versions of these quantities such as entropy rate and information rate much of the book is concerned with their properties especially the long term asymptotic behavior of sample information and expected information this is the only up to date treatment of traditional information theory emphasizing ergodic theory

the latest edition of this classic is updated with new problem sets and material the second edition of this fundamental textbook maintains the book s tradition of clear thought provoking instruction readers are provided once again with an instructive mix of mathematics physics statistics and information theory all the essential topics in information theory are covered in detail including entropy data compression channel capacity rate distortion network information theory and hypothesis testing the authors provide readers with a solid understanding of the underlying theory and applications problem sets and a telegraphic summary at the end of each chapter further assist readers the historical notes that follow each chapter recap the main points the second edition features chapters reorganized to improve teaching 200 new problems new material on source coding portfolio theory and feedback capacity updated references now current and enhanced the second edition of elements of

information theory remains the ideal textbook for upper level undergraduate and graduate courses in electrical engineering statistics and telecommunications

a first course in information theory is an up to date introduction to information theory in addition to the classical topics discussed it provides the first comprehensive treatment of the theory of i measure network coding theory shannon and non shannon type information inequalities and a relation between entropy and group theory itip a software package for proving information inequalities is also included with a large number of examples illustrations and original problems this book is excellent as a textbook or reference book for a senior or graduate level course on the subject as well as a reference for researchers in related fields

covers encoding and binary digits entropy language and meaning efficient encoding and the noisy channel and explores ways in which information theory relates to physics cybernetics psychology and art 1980 edition

originally developed by claude shannon in the 1940s information theory laid the foundations for the digital revolution and is now an essential tool in telecommunications genetics linguistics brain sciences and deep space communication in this richly illustrated book accessible examples are used to introduce information theory in terms of everyday games like 20 questions before more advanced topics are explored these advanced topics include a summary of the relationship between information theory and thermodynamic entropy and a review of applications in telecommunications and biology online matlab and python computer programs provide hands on experience of information theory in action and powerpoint slides give support for teaching written in an informal style with a comprehensive glossary and tutorial appendices this text is an ideal primer for novices who wish to learn the essential principles and applications of information theory publisher description

this monograph explores the interdisciplinary applications of information theory focusing on the concepts of entropy mutual information and their implications in various fields it explains the fundamental differences between entropy and shannon s measure of information smi presents the application of information theory to living systems and psychology and also discusses the role of entropy in art it critically overviews the definition of correlations and multivariate mutual information these notions are used to build a new perspective for understanding the irreversibility of processes in macroscopic systems while the dynamical laws governing the microscopic components are reversible it also delves into the use of mutual information in linguistics cryptography steganography and communication systems the book details the theoretical and practical aspects of information theory across a spectrum of disciplines and is a useful tool for any scientist interested in what is usually called entropy

from the reviews this book nicely complements the existing literature on information and coding theory by concentrating on arbitrary nonstationary and or nonergodic sources and channels with arbitrarily large alphabets even with such generality the authors have managed to successfully reach a highly unconventional but very fertile exposition rendering new insights into many problems mathematical reviews

divanalysis of channel models and proof of coding theorems study of specific coding systems and study of statistical properties of information sources sixty problems with solutions advanced undergraduate to graduate level div

classic source for exploring connections between information theory and physics geared toward upper level undergraduates and graduate students applies principles of information theory to maxwell s demon thermodynamics and measurement problems 1962 edition

entropy relative entropy and mutual information the asymptotic equipartition property entropy rates of a stochastic process data compression gambling and data compression kolmogorov complexity channel capacity differential entropy the gaussian channel maximum entropy and spectral estimation information theory and statistics rate distortion theory network information theory information theory and the stock market inequalities in information theory

focusing on both theory and practical applications this volume combines in a natural way the two major aspects of information representation representation for storage coding theory and representation for transmission information theory

this book presents the scientific outcome of a joint effort of the computer science departments of the universities of berne fribourg and neuchâtel within an initiative devoted to information and knowledge these research groups collaborated over several years on issues of logic probability inference and deduction the goal of this volume is to examine whether there is any common ground between the different approaches to the concept of information the structure of this book could be represented by a circular model with an innermost syntactical circle comprising statistical and algorithmic approaches a second larger circle the semantical one in which meaning enters the stage and finally an outermost circle the pragmatic one casting light on real life logical reasoning these articles are complemented by two philosophical contributions exploring the wide conceptual field as well as taking stock of the articles on the various formal theories of information

special attention is paid to terms which most often prevent educated readers from understanding journal articles and books in cryptology security and information systems and computer science in addition to applied fields that build on these disciplines such as system design security auditing vulnerability testing and role based management the emphasis throughout the information security dictionary is on concepts rather than implementations since concepts often complicate matters readers may find a definition makes sense only after it has been illustrated by an example which the author provides in this dictionary the dictionary of information security is designed for researchers students and practitioners in industry as well as educated readers interested in the security field book jacket

no detailed description available for aristotle and information theory

since the main principles of applied information theory were formulated in the 1940s the science has been greatly developed and today its areas of application range from traditional communication engineering problems to humanities and the arts interdisciplinary in scope this book is a single source reference for all applications areas including engineering radar computing technology television the life sciences including biology physiology and psychology and arts criticism a review of the current state of information theory is provided the author also presents several generalized and original results and gives a treatment of various problems this is a reference for both specialists and non professionals in information theory and general cybernetics

the mathematical theory of information presents a new mathematical theory of information built on a single powerful postulate the law of diminishing information the concept of information is here for the first time defined mathematically by adding this postulate to the axioms of the probability theory the law of diminishing information is founded on a fusion of two fundamental ideas carnap and bar hillel s ideal receiver and shannon s noisy channel the law of diminishing information is applied to information technology game theory legislation logic of research algorithmic information chaos theory control engineering medical tests and biological evolution in physics both the second law of thermodynamics and schrodinger s wave function are derived from the law of diminishing information conventional information theory that of telecommunications is analyzed as a special case and eight conditions for its applicability are listed the reader will get the essential ideas to

understand and use the concept of information the mathematical theory of information is suitable as a textbook in general information theory for students of technical scientific and mathematical subjects the book is ideal as a supplementary textbook in traditional courses on telecommunications information theory at all levels the website of the book is matheory info

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Introduction

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