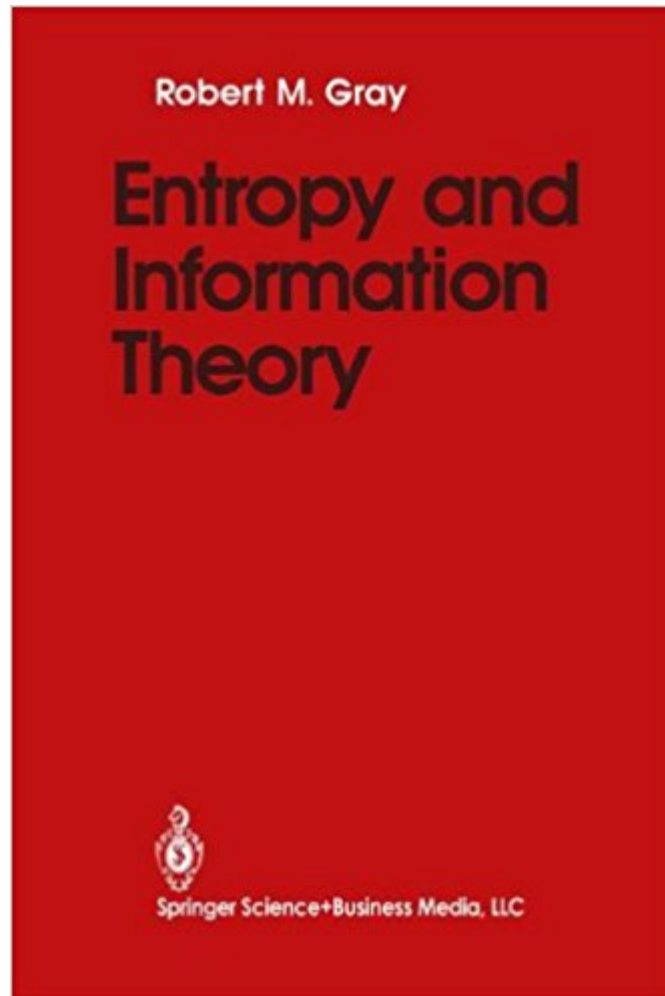




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Entropy And Information Theory



Synopsis

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.

Book Information

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Customer Reviews

From the book reviews: "This book is the second edition of the classic 1990 text and inherits much of the structure and all of the virtues of the original. This is a deep and important book, which would reward further study as the focus of a reading group or graduate course, and comes enthusiastically recommended." (Oliver Johnson, Mathematical Reviews, October, 2014) "In Entropy and Information Theory Robert Gray offers an excellent text to stimulate research in this field. Entropy and Information Theory is highly

recommended as essential reading to academics and researchers in the field, especially to engineers interested in the mathematical aspects and mathematicians interested in the engineering applications. It will contribute to further synergy between the two fields and the deepening of research efforts. (Ina Fourie, Online Information Review, Vol. 36 (3), 2012) "The book offers interesting and very important information about the theory of probabilistic information measures and their application to coding theorems for information sources and noisy channels. The main goal is a general development of Shannon's mathematical theory of communication for single-user systems. The author manages to balance the practice with the theory, every chapter is very well structured and has high-value content." (Nicolae Constantinescu, Zentralblatt MATH, Vol. 1216, 2011) --This text refers to an out of print or unavailable edition of this title.

Robert M. Gray is the Alcatel-Lucent Technologies Professor of Communications and Networking in the School of Engineering and Professor of Electrical Engineering at Stanford University. For over four decades he has done research, taught, and published in the areas of information theory and statistical signal processing. He is a Fellow of the IEEE and the Institute for Mathematical Statistics. He has won several professional awards, including a Guggenheim Fellowship, the Society Award and Education Award of the IEEE Signal Processing Society, the Claude E. Shannon Award from the IEEE Information Theory Society, the Jack S. Kilby Signal Processing Medal, Centennial Medal, and Third Millennium Medal from the IEEE, and a Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring (PAESMEM). He is a member of the National Academy of Engineering. --This text refers to an out of print or unavailable edition of this title.

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