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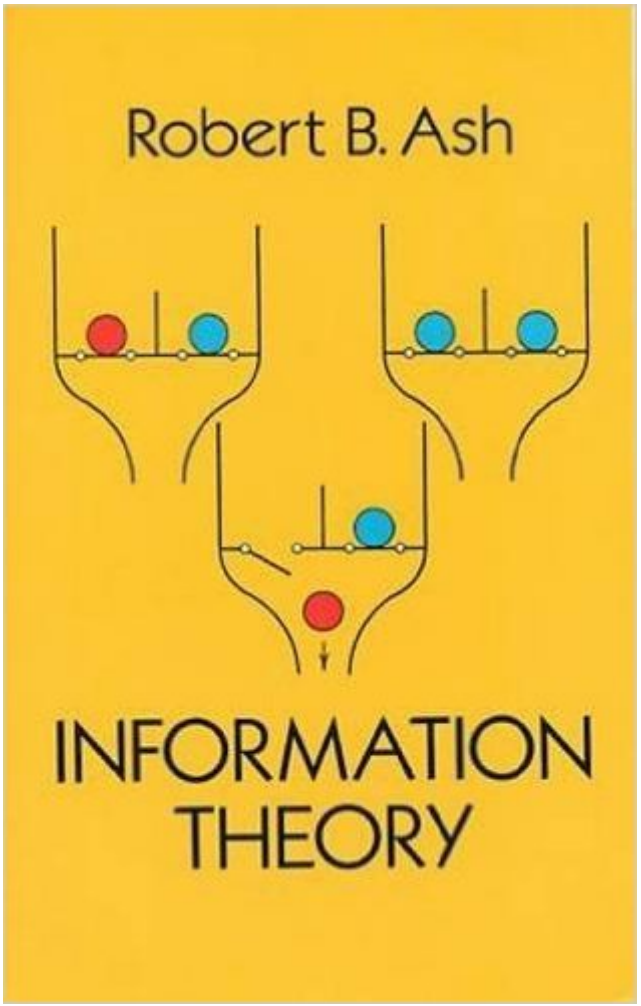
Information Theory (Dover Books On Mathematics)



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Synopsis

Developed by Claude Shannon and Norbert Wiener in the late 1940s, information theory, or statistical communication theory, deals with the theoretical underpinnings of a wide range of communication devices: radio, television, radar, computers, telegraphy, and more. This book is an excellent introduction to the mathematics underlying the theory.Designed for upper-level undergraduates and first-year graduate students, the book treats three major areas: analysis of channel models and proof of coding theorems (chapters 3, 7, and 8); study of specific coding systems (chapters 2, 4, and 5); and study of statistical properties of information sources (chapter 6). Among the topics covered are noiseless coding, the discrete memoryless channel, effort correcting codes, information sources, channels with memory, and continuous channels.The author has tried to keep the prerequisites to a minimum. However, students should have a knowledge of basic probability theory. Some measure and Hilbert space theory is helpful as well for the last two sections of chapter 8, which treat time-continuous channels. An appendix summarizes the Hilbert space background and the results from the theory of stochastic processes necessary for these sections. The appendix is not self-contained but will serve to pinpoint some of the specific equipment needed for the analysis of time-continuous channels.In addition to historic notes at the end of each chapter indicating the origin of some of the results, the author has also included 60 problems with detailed solutions, making the book especially valuable for independent study.

Book Information

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Customer Reviews

This book is highly similar to the Reza book, also published by Dover publications. The Ash book kind of continues where the Reza book leaves off. In truth, this book is very, very rigorous... not so much in terms of proofs (see the small Khinchin book for great proofs), but in terms of it involves mathematics and concepts which require a higher level of knowledge. Undergraduate students would have alot of trouble trying to understand both math and general concepts.Even graduate students would find this book daunting, because after all, it probably is one of the best books written on information theory.If your a beginner seeking a good book, this is not it at all.Aside from being too rigorous, it covers many topics which are of completely no use to a beginner or even somebody with a fair amount of information theory knowledge. Also, the book is not very motivating from a practical aspect. That is, much like the Reza and Kitchkin book, it’s written more from a dry mathematical perspective and not an "engineers" perspective.It doesn’t examine information theory from the perspective of electrical engineering and communications theory... which might make it hard for some people to relate to if they can’t be told what the practical applications are (see Pierce’s books and Cover and Thomas for very good "practical" books).For beginners, I recommend the Pierce book, subtitled "Symbols, Signals and Noise" which is bar-none the best beginners book ever written (or some of Pierce’s other books). Pierce is one of the finest authors of his era and he published several books on information theory; most of which are more "engineer friendly" and are more relavent to the study of electronic communications.Summary, this book is NOT for beginners.

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