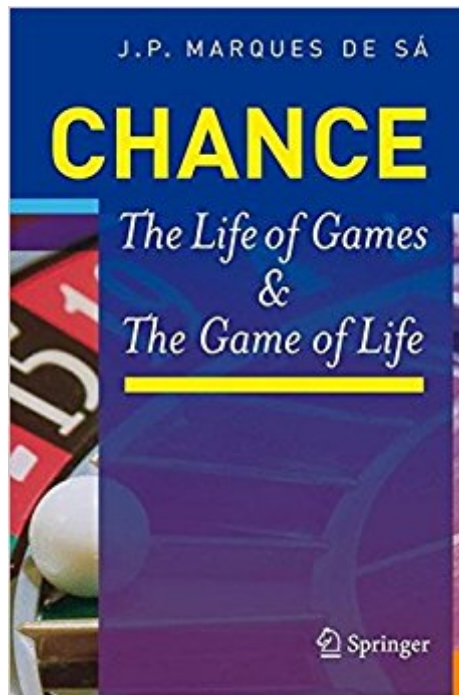




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# Chance: The Life Of Games & The Game Of Life



## Synopsis

This is a unique book on how probability affects our everyday lives. It guides the reader in an almost chronological trip through the fascinating and amazing laws of chance, omnipresent in the natural world and in our daily lives. Along the way many fascinating topics are discussed. These include challenging probability paradoxes, "paranormal" coincidences, game odds, and causes and effects. Finally the author discusses possibilities and limitations of learning the laws of a Universe immersed in chance events. This charming book, with its many easy-to-follow mathematical examples, will inform and entertain the scientist and non-scientist alike.

## Book Information

Paperback: 224 pages

Publisher: Springer; 2008 edition (April 7, 2008)

Language: English

ISBN-10: 3540744169

ISBN-13: 978-3540744160

Product Dimensions: 6.1 x 0.6 x 9.2 inches

Shipping Weight: 1.1 pounds (View shipping rates and policies)

Average Customer Review: 3.5 out of 5 stars 4 customer reviews

Best Sellers Rank: #3,819,934 in Books (See Top 100 in Books) #95 in Books > Science & Math > Physics > Entropy #845 in Books > Science & Math > Evolution > Game Theory #2925 in Books > Science & Math > Physics > Mathematical Physics

## Customer Reviews

From the reviews: "This book gives a delightful overview of Probability, that is Chance, as a phenomenon in both games and life. | I found this book to be filled with example that I will use in class the next time I teach Probability. | The author keeps the mathematical prerequisites to a minimum, so that this book would be accessible to an undergraduate | . I would consider using it as a text for a student who wanted to do an independent study of probability theory." (Barbara E. Reynolds, MathDL, July, 2008) "This book on chance is a translation of the 2006 Portuguese original. | it may be read by almost anybody who is interested in the subject of chance." (A. N. Philippou, Mathematical Reviews, Issue 2009 a)

With its many easy-to-follow mathematical examples, this book takes the reader on an almost chronological trip through the fascinating and amazing laws of chance, omnipresent in the natural

world and in our daily lives. Along the route many fascinating topics are discussed, such as: challenging probability paradoxes; "paranormal" coincidences; game odds; causes and effects; interpretation of opinion polls; winning chances as a game proceeds; the nature of randomness; entropy and randomness; randomness in life; algorithmic complexity and the undecidability of randomness; possibilities and limitations of learning the laws of a Universe immersed in chance events. This charming book will inform and entertain the scientist and non-scientist alike.

It doesn't seem like I'm reading the same book as the other reviewers. This thing is almost incomprehensible. Surely beyond the understanding of even many with typical graduate degrees unless you happen to be Einstein or Alan Turing. If I hadn't previously read some other probability books (Lady Luck by Weaver and Taking Chances by Haigh), I would have given up after the first few chapters. Maybe it's because the author is Portuguese and something gets lost in the translation. Mathematical permutations and combinations, that are explained in the other books, are very confusing here. Trying to describe the seemingly important Bayes theorem, the author comes up with formulas that don't logically follow his word descriptions. Maybe by trying to simplify the mathematics, he has instead made it more confusing. My recommendation: try some other more readable probability books than this. If I hadn't already marked in this, it would have been going back.

This valuable book explains the mathematics of chance in a broad variety of contexts. The author is an Engineering Professor, and has included plenty of charts and graphs and elementary math formulas -- this style is certainly OK for readers who have taken College courses in mathematics or engineering or physics but might deter other readers. The first half (Chapters 1 - 5) covers rather standard material covered in many other popular expositions (Struck by Lightning: The Curious World of Probabilities or Chance Rules: An Informal Guide to Probability, Risk and Statistics) and in introductory college textbooks. Specific topics: the basic math set-up and rules, binomial distribution, combinatorial examples like poker hands and "derangements", familiar paradoxes (Monty Hall, two envelopes, St Petersburg), law of large numbers, chance of winning a specified amount at roulette, normal distribution, confidence intervals for opinion polls, correlation and "correlation is not causation". The second half is more distinctive, in that it includes a little mathematics in discussing less elementary topics that are typically discussed only verbally in "popular science" style books (e.g. The Jungles of Randomness: A Mathematical Safari). Specific topics: the arc sine law for last zero of random walk; Cauchy distribution; Borel normal number

theorem; quantum probability and the two slit experiment; deterministic chaos via the quadratic iteration; Lorenz equation; random number generators, white noise, fractional Brownian motion; information-theoretic entropy; Ehrenfest dog-flea model; Zipf's law; algorithmic complexity and Chaitin's constant. This book does an excellent job of providing clear explanations of standard theory, and at its mathematical level it is the broadest account I have seen, so I can highly recommend it for readers comfortable with this mathematical level. My personal criticism -- which applies to almost all books of this type -- is that the author writes as if mathematical results were true statements about the real world. This attitude jumps over two issues: what precisely is it that a mathematical theory (information-theoretic entropy, say) claims is true about the real world, and what empirical evidence is there for its truth? Here the author (like most authors) gives only occasional real data while mostly resorting to "suppose" stories: e.g. (page 32) "suppose  $P(\text{DNA match if innocent}) = 1 \text{ in a million}$ "

This is a fine book about probability theory written from a European perspective. It does become somewhat confusing in the middle. But, it is about much more than "chance" (or less if you will) as American readers would define it.

This book gives a delightful overview of Probability, that is, Chance, as a phenomenon in both games and life. The writing style is clear and engaging. Concepts of probability theory are presented in a way that helps the reader realize why we would want to understand these ideas. As a mathematician who teaches probability and statistics courses from time to time, I found this book to be filled with examples that I will use in class the next time I teach Probability. When the author uses the usual examples of flipping coins, rolling dice, and drawing balls from an urn, he makes it clear how these probability experiments can be used to model real life. In ten chapters, this book presents an intuitive overview of the theory of probability, including both the classical notion of probability, and use of relative frequencies to estimate probabilities. There are chapters on conditional probability (Amazing Conditions), mathematical expectation (Expecting to Win), the normal and binomial distributions, and the law of large numbers (The Wonderful Curve), inference (Probable Inferences), chance and determinism (The Nature of Chance), and sequences and random processes (Noisy Irregularities). Games of chance that are played in casinos (roulette, craps, card games, slot machines) and state-sponsored lottery games are introduced early, and recur throughout the book as examples that bring light to concepts that can be difficult to explain. These games form the backdrop for explaining mathematical expectation; after all, a casino does not stay

in business unless the House is winning in the long run. The author consistently connects these examples to probabilities that I care about in daily life, such as the probability of having cancer given the outcome of a screening test. My students are likely to enjoy the last chapter, Living with Chance, in which the author discusses Learning, in Spite of Chance, and proves that there are circumstances in which learning is impossible. The author keeps the mathematical prerequisites to a minimum, so that this book would be accessible to an undergraduate who has completed Calculus. In fact, no calculus is used in this book, but an undergraduate who has completed calculus would have the mathematical maturity to read (and enjoy!) this book. The author provides appendices on Powers, the Exponential Function, the Logarithmic Function, the Factorial Function, Sinusoids, and the Binary Number System for those students who need a review (or even a basic introduction) to these topics. Although this is not a textbook (for one thing, there are no exercises), I would consider using it as a text for a student who wanted to do an independent study of probability theory. Apparently this book was first written in Portuguese, but no translator is given. I surmise then that the author himself is the translator. The back cover note mentions that the author has written "four books in Portuguese and three in English." I mention this because this book does not read like a translation; the author-translator gives an excellent presentation of this material, and one is not distracted by awkward phrases that sometimes appear in material that has been translated from another language. This book reads as if it were originally written in English.

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