Лунодром "Дебианити" - Lunodrom "Debiane"

by no other than Virens

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Books about probability and statistics

The field of probability is notorious for bad book, especially at the introductory level. One must be aware that modern probability theory uses linear algebra extensively that can be a big surprise for those who studies the probability using books written in 60x of the last century.

Intuitive Probability and Random Processes using MATLAB by Steven Kay

The explanations of basic concepts are very clear and the text is not overloaded with formalism (to the extent it is possible to be formal - meaning, the book is not sloppy about his presentation). The Intuitive Probability offers a complete introduction into modern applied probability, along with real world examples and illustrations of key concepts. The book targets signal processing and, to the certain extent, data mining, and is definitely worth reading. You will need MATLAB or at least its poor substitute called Octave.

If you are having difficulty with other shorter texts and if you have got an itch to scratch (wants to use your computer to simulate some stuff and do some problems), I think you will enjoy and benefit quite a lot from this book. Probably one of the best probability books around, given that this field is notorious for awful and cryptic books.

Probability, Random Processes with Applications to Signal Processing by Stark and Woods

Stark and Woods give you a good start with applied probability, and they use linear algebra extensively. I liked the book until chapter 5, after which it quickly went downhill and started to be very cryptic (especially in Cramer-Rao bounds). This book does not spend much time on explaining concepts and ideas. Rather than that, it shows applications.

On the negative side, the book is somewhat scattered. The introduction to random variables and subsequent random process treatment jumps all over the place, skipping many integral pieces and steps along the way.

Introduction to Probability and Statistics for Engineers and Scientists, by Sheldon M. Ross.

This book is not about probability in the first place, but more about statistics. Sheldon Ross does a good job explaining the statistics and gives a smooth learning curve up to regressions and maximum likelihood. On positive side, in this book there are many topics and parts (e.g., regression to the mean) that are of interest to an engineer and are not covered in other books.

But the most serious shortcoming in this book is the failure to bridge the gap between theory and application: there are no worked examples in most cases, just equations in the chapter, then problems at the end. One must be aware of lots of errors and mistakes in the text. However, this might force you to think about the statistics.

Probability and Random Processes (Wiley Survival Guides in Engineering and Science) by Venkatarama Krishnan

Probability and Random Processes by V. Krishnan is develops all the basic mathematics needed for the topics from the very fundamentals. This way the reader won't have to look for another book for the tutorial. A good example is the chapter on matrix algebra.

The author has been teaching random processes and probability course in electrical engineering departments for more than 40 years, and his book really shows his expertise in teaching and the filed. The books has very nice illustrations - I wish all authors paid more attention to their graphs and illustrations.

Conditional and joint densities, moments, characteristic functions and generating functions are described in great detail in the first quarter of the book (chapters 1 to 11). These are very important concepts to fully understand, in order to have a firm foundation for the appreciation of the more complex and subtle concepts that follow. It has also details of nearly all known and useful distributions so that it is a very nice reference book also.

To sum up, Probability and Random Processes by Venkatarama Krishnan is definitely worth reading: loads of very useful, practical examples and fully explained material.

Probability, Random Variables and Stochastic Processes, by Athanasios Papoulis and S. Unnikrishna Pillai

First and the foremost: this is a **reference** book, and is NOT a textbook by any means. That is, the book by Papoulis is for quick look for a people who already have a solid background in probability. The book is just a very long stream of random processes equations with some explanation in between. One can read it from front to back, but this is a book that definitely requires diligence and effort to get through.

This book is probably not the best book for a beginner. However, it treats probability with a scientific rigour, and follows logical proofs that any of us could do.

One good feature of this book (and maybe this is why it is so widely used) is that it covers a very extensive list of topics.

Other books worth looking at

Below is just a list of books about which I have heard something positive:

- Prob \& Stats for Engineers and Scientists by Walpole and Meyers, 6th Edition.
- Probability and Stochastic process: a friendly introduction for electrical and computer engineers by Roy D. Yates.
- Probability and Stochastic Processes: A Friendly Introduction for Electrical and Computer Engineers, 2nd Edition Roy D. Yates (Rutgers University, NJ), David Goodman (Polytechnic University, NY) May 2004
- Statistics for Imaging, Optics and Photonics, by Peter Bajorski.

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