Jane M. Horgan: Probability with R, an introduction with computer science applications

Wiley, Hoboken, 2009, viii+393, NJ

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Published online: 18 September 2011
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This book is a “hands on” computational introduction to Probability. The author describes her approach in the Preface: “In this book, we have largely replaced the mathematical approach to probability by one of simulation and experimentation. . . The text is designed for students who have taken a first course in mathematics, involving just a little calculus. . . Mathematical derivations in the main text are kept to a minimum. . . almost all new ideas are introduced and illustrated by real examples. . .”

This approach is carried out seamlessly. The first three chapters are an introduction to R; Chapters 4–8 give the fundamentals of Probability, including conditional probability, Bayes, and applications to reliability. Chapters 9–14 deal with discrete distributions, with special attention to the geometric, binomial, hypergeometric and Poisson distributions, and an application to sampling inspection schemes. Chapters 15–19 are devoted to continuous distributions, in particular the exponential and normal distributions, and applications to process control. Chapter 20 deals with Markov and Chebyshev bounds. Appendices A and B contain some mathematical derivations.

The book is written in a pleasant style. There are numerous examples complete with R code and plots. At the end of each chapter there are exercises and projects. The book can be used as the basis of a course, and also for self study.

There are some people (including this reviewer) who think that mathematical abstraction is a capability that needs to be developed by everybody involved in science and technology, including Computer Science students. However, if you don’t share this point of view and want an easy introduction to Probability, this book will not disappoint you.

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