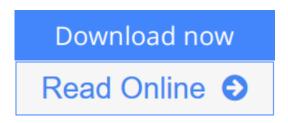# Bayesian Networks: With Examples in R (Chapman & Hall/CRC Texts in Statistical Science)

By Marco Scutari, Jean-Baptiste Denis

Bayesian Networks: With Examples in R (Chapman & Hall/CRC Texts in Statistical Science) By Marco Scutari, Jean-Baptiste Denis

Understand the Foundations of Bayesian Networks?Core Properties and Definitions Explained

Bayesian Networks: With Examples in R introduces Bayesian networks using a hands-on approach. Simple yet meaningful examples in R illustrate each step of the modeling process. The examples start from the simplest notions and gradually increase in complexity. The authors also distinguish the probabilistic models from their estimation with data sets.

The first three chapters explain the whole process of Bayesian network modeling, from structure learning to parameter learning to inference. These chapters cover discrete Bayesian, Gaussian Bayesian, and hybrid networks, including arbitrary random variables.

The book then gives a concise but rigorous treatment of the fundamentals of Bayesian networks and offers an introduction to causal Bayesian networks. It also presents an overview of R and other software packages appropriate for Bayesian networks. The final chapter evaluates two real-world examples: a landmark causal protein signaling network paper and graphical modeling approaches for predicting the composition of different body parts.

Suitable for graduate students and non-statisticians, this text provides an introductory overview of Bayesian networks. It gives readers a clear, practical understanding of the general approach and steps involved.

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Editorial Review

Review

"… an excellent introduction to Bayesian networks with detailed user-friendly examples and computer-aided illustrations. I enjoyed reading **Bayesian Networks: With Examples in R** and think that the book will serve very well as an introductory textbook for graduate students, non-statisticians, and practitioners in Bayesian networks and the related areas."
?*Biometrics,* September 2015

"Several excellent books about learning and reasoning with Bayesian networks are available and **Bayesian Networks: With Examples in R** provides a useful addition to this list. The book is usually easy to read, rich in examples that are described in great detail, and also provides several exercises with solutions that can be valuable to students. The book also provides an introduction to topics that are not covered in detail in existing books … . It also provides a good list of search algorithms for learning Bayesian network structures. But the major strength of the book is the simplicity that makes it particularly suitable to students with sufficient background in probability and statistical theory, particularly Bayesian statistics."
?*Journal of the American Statistical Association*, June 2015

About the Author

Marco Scutari is a research associate in statistical genetics at the Genetics Institute, University College London (UCL). He studied statistics and computer science at the University of Padova. He is the author and maintainer of the bnlearn R package. His research focuses on the theory of Bayesian networks and their applications to biological data.

Jean-Baptiste Denis is a senior scientist in the Applied Mathematics and Computer Science Department at the French National Institute for Agricultural Research. His main research interests are Bayesian approaches to statistics and networks, especially applications to microbiological food safety.

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