Bayesian Model Selection and Statistical Modeling, Tomohiro Ando (Keio University, Kanagawa, Japan), CRC Press, Taylor & Francis Group, Boca Raton, ISBN 978-1439836149 (hardcover, $89.95), xiv+286 pages, by Christian P. Robert, Université Paris-Dauphine, Institut Universitaire de France, and CREST, Paris.

Table of contents

Readership: Statistics graduate students and researchers in Bayesian model choice.

While Bayesian model selection is one of my favourite research topics, I am alas disappointed after reading this book. First, the innovative part of the book is mostly based on papers written by the author over the past five years, revolving around the Bayesian predictive information criterion (BPIC, Ando, 2007). Second, the more general picture constitutes a regression when compared with existing books like Chen et al. (2000). The coverage of the existing literature is often incomplete and sometimes confusing. This is especially true for the computational aspects that are generally poorly treated or at least not treated in a way from which a newcomer to the field would benefit. For instance, the Metropolis-Hastings algorithm (page 66) is first introduced in a Metropolis-within-Gibbs framework, however the acceptance probability forgets to account for the other components of the parameter; or Chapter 6 opts for the worst possible choice in the "Gelfand-Day's" *(sic!)* and bridge sampling estimators by considering the harmonic mean version with the sole warning that it "can be unstable in some applications" (page 172).

The author often uses complex econometric models as illustrations, which is nice; however, he does not pursue the details far enough for a reader to replicate the study without further reading. The few exercises in each chapter are rarely helpful, more like appendices. Take, e.g., Exercise 6, page 196, which (re-)introduces the Metropolis-Hastings algorithm, even though it has already been defined on page 66, and then asks the reader to derive a marginal likelihood estimator. Another exercise on page 164 covers the

theory of DNA micro-arrays and gene expression in ten lines (repeated verbatim page 227), then asks the reader to identify marker genes responsible for a certain trait.

The quality of the editing is quite poor, with numerous typos throughout the book. For instance, as a short sample of those, Gibbs sampling is spelled Gibb's sampling (only) in Chapter 6, the bibliography is not printed in alphabetical order and contains erroneous entries, like Jacquier, Nicolas and Rossi (2004) or Tierney and Kanade (1986), some sentences are not grammatically correct (e.g., "the posterior has multimodal", page 55) or meaningful (e.g., "the accuracy of this approximation on the tails may not be accurate", page 49).

After reading this book, I feel the contribution to the field of *Bayesian Model Selection and Statistical Modeling* is too limited and disorganised for the book to be recommended as "helping you choose the right Bayesian model" (as advertised on the back-cover). It certainly falls short of being an appropriate textbook for most audiences.

References

ANDO, T. (2007). Bayesian predictive information criterion for the evaluation of hierarchical Bayesian and empirical Bayes models. *Biometrika*, **94** 443–458.

CHEN, M., SHAO, Q. and IBRAHIM, J. (2000). *Monte Carlo Methods in Bayesian Computation*. Springer-Verlag, New York.