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Nota di contenuto	Case Studies in Bayesian Statistical Modelling and Analysis; Contents; Preface; List of contributors; 1 Introduction; 1.1 Introduction; 1.2 Overview; 1.3 Further reading; 1.3.1 Bayesian theory and methodology; 1.3.2 Bayesian methodology; 1.3.3 Bayesian computation; 1.3.4 Bayesian software; 1.3.5 Applications; References; 2 Introduction to MCMC; 2.1 Introduction; 2.2 Gibbs sampling; 2.2.1 Example: Bivariate normal; 2.2.2 Example: Change-point model; 2.3 Metropolis-Hastings algorithms; 2.3.1 Example: Component-wise MH or MH within Gibbs; 2.3.2 Extensions to basic MCMC; 2.3.3 Adaptive MCMC 2.3.4 Doubly intractable problems2.4 Approximate Bayesian computation; 2.5 Reversible jump MCMC; 2.6 MCMC for some further applications; References; 3 Priors: Silent or active partners of Bayesian inference?; 3.1 Priors in the very beginning; 3.1.1 Priors as a basis for learning; 3.1.2 Priors and philosophy; 3.1.3 Prior chronology; 3.1.4 Pooling prior information; 3.2 Methodology I: Priors defined by mathematical criteria; 3.2.1 Conjugate priors; 3.2.2 Impropriety and hierarchical priors; 3.2.3 Zellner's g-prior for regression models; 3.2.4

Objective priors

3.3 Methodology II: Modelling informative priors3.3.1 Informative modelling approaches; 3.3.2 Elicitation of distributions; 3.4 Case studies; 3.4.1 Normal likelihood: Time to submit research dissertations; 3.4.2 Binomial likelihood: Surveillance for exotic plant pests; 3.4.3 Mixture model likelihood: Bioregionalization; 3.4.4 Logistic regression likelihood: Mapping species distribution via habitat models; 3.5 Discussion; 3.5.1 Limitations; 3.5.2 Finding out about the problem; 3.5.3 Prior formulation; 3.5.4 Communication; 3.5.5 Conclusion; Acknowledgements; References

4 Bayesian analysis of the normal linear regression model4.1 Introduction; 4.2 Case studies; 4.2.1 Case study 1: Boston housing data set; 4.2.2 Case study 2: Production of cars and station wagons; 4.3 Matrix notation and the likelihood; 4.4 Posterior inference; 4.4.1 Natural conjugate prior; 4.4.2 Alternative prior specifications; 4.4.3 Generalizations of the normal linear model; 4.4.4 Variable selection; 4.5 Analysis; 4.5.1 Case study 1: Boston housing data set; 4.5.2 Case study 2: Car production data set; References; 5 Adapting ICU mortality models for local data: A Bayesian approach

5.1 Introduction5.2 Case study: Updating a known risk-adjustment model for local use; 5.3 Models and methods; 5.4 Data analysis and results; 5.4.1 Updating using the training data; 5.4.2 Updating the model yearly; 5.5 Discussion; References; 6 A Bayesian regression model with variable selection for genome-wide association studies; 6.1 Introduction; 6.2 Case study: Case-control of Type 1 diabetes; 6.3 Case study: GENICA; 6.4 Models and methods; 6.4.1 Main effect models; 6.4.2 Main effects and interactions; 6.5 Data analysis and results; 6.5.1 WTCCC TID; 6.5.2 GENICA; 6.6 Discussion

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Sommario/riassunto

Provides an accessible foundation to Bayesian analysis using real world models This book aims to present an introduction to Bayesian modelling and computation, by considering real case studies drawn from diverse fields spanning ecology, health, genetics and finance. Each chapter comprises a description of the problem, the corresponding model, the computational method, results and inferences as well as the issues that arise in the implementation of these approaches. Case Studies in Bayesian Statistical Modelling and Analysis: Illustrates how