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Nota di contenuto	Cover; Title Page; Copyright; Contents; Preface; Chapter 1 Bayesian methods and Bayesian estimation; 1.1 Introduction; 1.1.1 Summarising existing knowledge: Prior densities for parameters; 1.1.2 Updating information: Prior, likelihood and posterior densities; 1.1.3 Predictions and assessment; 1.1.4 Sampling parameters; 1.2 MCMC techniques: The Metropolis-Hastings algorithm; 1.2.1 Gibbs sampling; 1.2.2 Other MCMC algorithms; 1.2.3 INLA approximations; 1.3 Software for MCMC: BUGS, JAGS and R-INLA; 1.4 Monitoring MCMC chains and assessing convergence; 1.4.1 Convergence diagnostics 1.4.2 Model identifiability1.5 Model assessment; 1.5.1 Sensitivity to priors; 1.5.2 Model checks; 1.5.3 Model choice; References; Chapter 2 Hierarchical models for related units; 2.1 Introduction: Smoothing to the hyper population; 2.2 Approaches to model assessment: Penalised fit criteria, marginal likelihood and predictive methods; 2.2.1 Penalised fit criteria; 2.2.2 Formal model selection using marginal likelihoods; 2.2.3 Estimating model probabilities or marginal likelihoods in practice; 2.2.4 Approximating the posterior density; 2.2.5 Model averaging from MCMC samples 2.2.6 Predictive criteria for model checking and selection: Cross-validation2.2.7 Predictive checks and model choice using complete data replicate sampling; 2.3 Ensemble estimates: Poisson-gamma and Beta-

binomial hierarchical models; 2.3.1 Hierarchical mixtures for poisson and binomial data; 2.4 Hierarchical smoothing methods for continuous data; 2.4.1 Priors on hyperparameters; 2.4.2 Relaxing normality assumptions; 2.4.3 Multivariate borrowing of strength; 2.5 Discrete mixtures and dirichlet processes; 2.5.1 Finite mixture models; 2.5.2 Dirichlet process priors
2.6 General additive and histogram smoothing priors2.6.1 Smoothness priors; 2.6.2 Histogram smoothing; Exercises; Notes; References; Chapter 3 Regression techniques; 3.1 Introduction: Bayesian regression; 3.2 Normal linear regression; 3.2.1 Linear regression model checking; 3.3 Simple generalized linear models: Binomial, binary and Poisson regression; 3.3.1 Binary and binomial regression; 3.3.2 Poisson regression; 3.4 Augmented data regression; 3.5 Predictor subset choice; 3.5.1 The g-prior approach; 3.5.2 Hierarchical lasso prior methods; 3.6 Multinomial, nested and ordinal regression
3.6.1 Nested logit specification3.6.2 Ordinal outcomes; Exercises; Notes; References; Chapter 4 More advanced regression techniques; 4.1 Introduction; 4.2 Departures from linear model assumptions and robust alternatives; 4.3 Regression for overdispersed discrete outcomes; 4.3.1 Excess zeroes; 4.4 Link selection; 4.5 Discrete mixture regressions for regression and outlier status; 4.5.1 Outlier accommodation; 4.6 Modelling non-linear regression effects; 4.6.1 Smoothness priors for non-linear regression; 4.6.2 Spline regression and other basis functions; 4.6.3 Priors on basis coefficients
4.7 Quantile regression

Sommario/riassunto

This book provides an accessible approach to Bayesian computing and data analysis, with an emphasis on the interpretation of real data sets. Following in the tradition of the successful first edition, this book aims to make a wide range of statistical modeling applications accessible using tested code that can be readily adapted to the reader's own applications. The second edition has been thoroughly reworked and updated to take account of advances in the field. A new set of worked examples is included. The novel aspect of the first edition was the coverage of statistical modeling using Win