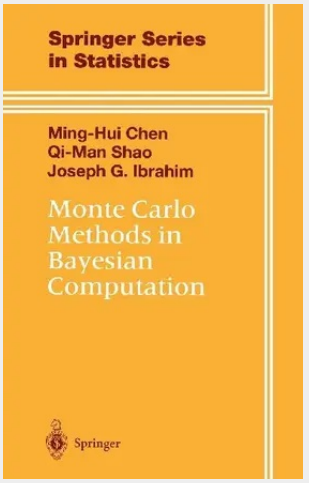
Chen / Shao / Ibrahim

Monte Carlo Methods in Bayesian Computation



Sampling from the posterior distribution and computing posterior quanti ties of interest using Markov chain Monte Carlo (MCMC) samples are two major challenges involved in advanced Bayesian computation. This book examines each of these issues in detail and focuses heavily on comput ing various posterior quantities of interest from a given MCMC sample. Several topics are addressed, including techniques for MCMC sampling, Monte Carlo (MC) methods for estimation of posterior summaries, improv ing simulation accuracy, marginal posterior density estimation, estimation of normalizing constants, constrained parameter problems, Highest Poste rior Density (HPD) interval calculations, computation of posterior modes, and posterior computations for proportional hazards models and Dirichlet process models. Also extensive discussion is given for computations in volving model comparisons, including both nested and nonnested models. Marginal likelihood methods, ratios of normalizing constants, Bayes fac tors, the Savage-Dickey density ratio, Stochastic Search Variable Selection (SSVS), Bayesian Model Averaging (BMA), the reverse jump algorithm, and model adequacy using predictive and latent residual approaches are also discussed. The book presents an equal mixture of theory and real applications.

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