On adaptive Markov Chain Monte Carlo method

Leonidas Sakalauskas ŠiauliaiUniversity P. Višinskiost. 25, LT-08663, Šiaulai Lithuania E-mail: <leonidas.sakalauskas@mii.vu.lt>

The aim of the paper is to present the adaptive Markov chain Monte Carlo (MCMC) method for computationally effective data analysis algorithms, constructed for stochastic optimization of likelihood, least squares or other objective function, describing quality of data analysis. The approach distinguishes by regulation of Monte Carlo sample size in separate chains, assessment of accuracy of the estimators, and the termination of Markov chain process in statistical manner. The algorithms constructed are employed for statistical estimation of data models by MCMC method. Effectiveness of the approach is explored by statistical modelling on computer using simulated and practical data. The numerical problems of MCMC method by solving several exercises of data analysis are discussed (estimation of parameters of multivariate stable distribution, skew *t* distribution and empirical Bayesian model). The aforementioned exercises are characterized by properties that are common to many similar tasks, thus, the approach developed can be successfully applied for other statistical exercises as well.

References

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