STK4021 Applied Bayesian Analysis compendium

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1 Markov chain Monte Carlo

1.1 Gibbs sampler

1.1.1 Determined scan Gibbs sampler

With two parameters

Gibbs sampling is practical when you wish to sample $\theta_1, \theta_2 \sim p(\theta_1, \theta_2)$, but cannot use:

- direct simulation
- accept-reject method
- Metropolis-Hasting

But you can sample from:

- $p(\theta_1|\theta_2)$ and
- $p(\theta_2|\theta_1)$

Algorithm

1. Select intial values for the parameters $\theta^{(0)}$
2. Repeat for a given number of iterations, or untill some end condition is met:
   (a) for each subset θ_j of θ:
      i. sample from $p\left(\theta_j^{(t)}|\theta_{-j}^{(t-1)}, y\right)$

1.1.2 Random scan Gibbs sampler

Special case of Metropolis-Hastings. randomly select which subset og theta to update each iteration.