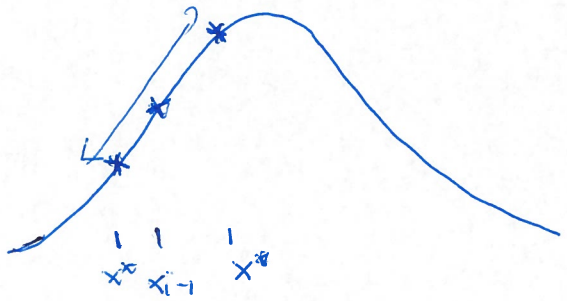
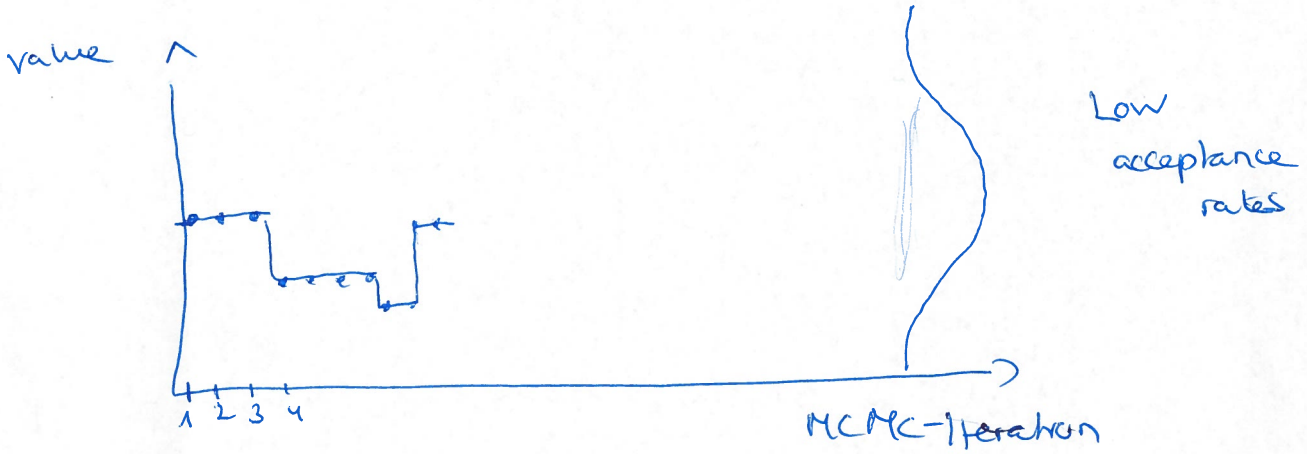
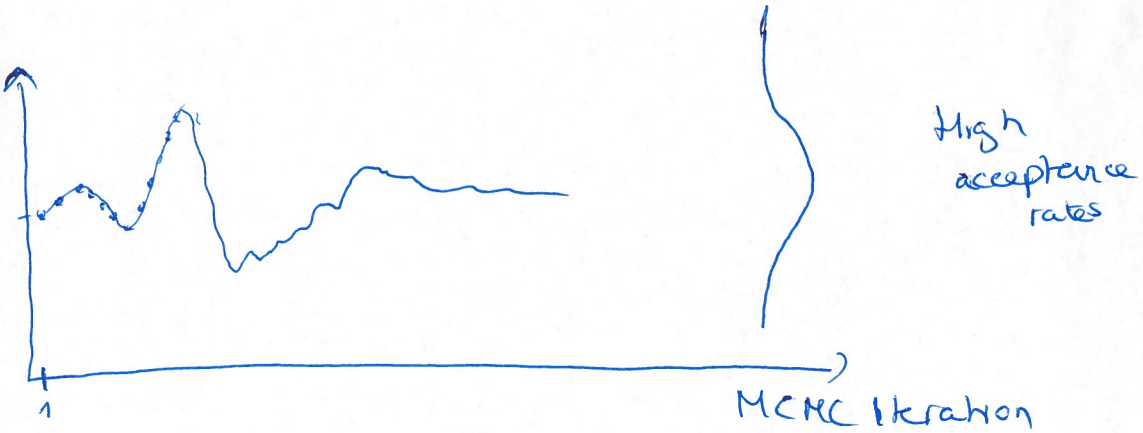
Lecture 9

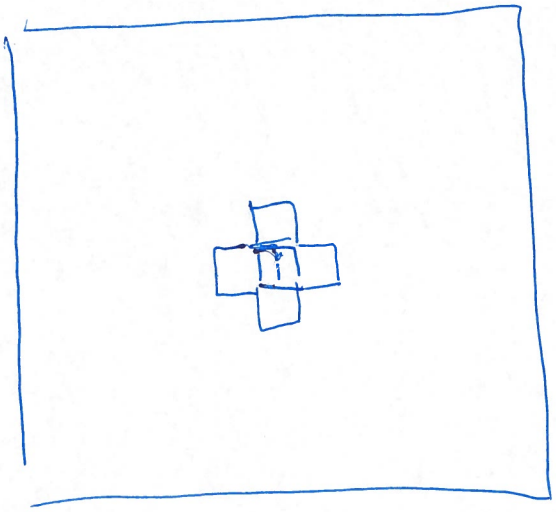

x^*
x_{i-1}
x^*


value
1
2
3
4
MCMC-Iteration
Low acceptance rates


1
MCMC Iteration
High acceptance rates

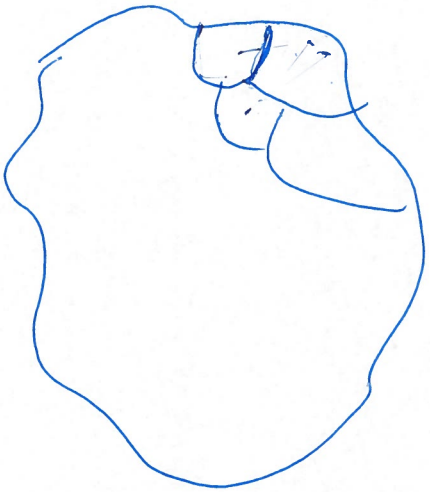
Neighbourhood structures

Ising:



$i \sim j$

"i is neighbour of j"



Gibbs sampling: acceptance rate

$$\frac{\pi(x^*)}{\pi(x)} \cdot \frac{Q(x \mid x^*)}{Q(x^* \mid x)}$$

$$\frac{\pi(x_i^* \mid x_{-i}^*)\,\pi(x_{-i}^*)\,Q(x \mid x^*)}{\pi(x_i \mid x_{-i})\,\pi(x_{-i})\,Q(x^* \mid x)}$$

$$= \frac{\pi(x_i^* \mid x_{-i})\,\cancel{\pi(x_{-i})}\,Q(x \mid x^*)}{\pi(x_i \mid x_{-i})\,\cancel{\pi(x_{-i})}\,Q(x^* \mid x)}$$

$$= \frac{\cancel{\pi(x_i^* \mid x_{-i})} \cdot \cancel{\pi(x_i \mid x_{-i}^*)}}{\cancel{\pi(x_i \mid x_{-i})} \cdot \cancel{\pi(x_i^* \mid x_{-i})}} = 1$$