STA561: Probabilistic machine learning

Variational Inference (11/4/13)

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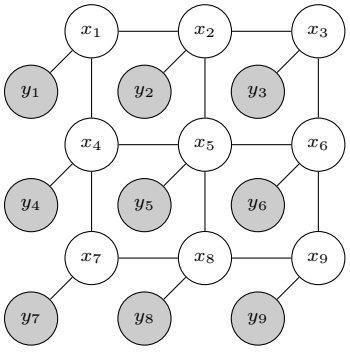
1 Introduction

2 Ising Model

Before proceeding with variational inference, it is helpful to review the Ising model. The main idea behind the Ising model is a lattice of unobserved variables $(x_1, ...x_n)$, each with its own (noisy) observation $(y_1, ..., y_n)$). For example, we can think of the lattice as pixels in a black and white image ($x_i \in \{-1, 1\}$), with a noisy grayscale observation of the pixels ($y_i \in R$). Our goal in this case would be to obtain a de-noised version of the image. More generally, we wish to draw inferences about the unobserved lattice X from the observed values Y.



3 Loopy Belief Propogation