

Probabilistic Graphical Models - Problem Set 6

December 2015

Look at the student network in page 488 in the book and the two particles:
 $\xi[1] = \langle d^0, i^1, g^2, s^0, l^1 \rangle$ and $\xi[2] = \langle d^1, i^1, g^3, s^0, l^1 \rangle$.

A) Which of the particles are you more likely to get using the Forward Sampling algorithm (page 489)?

B) Which of the particles will have a larger weight result when running the Likelihood Weighting Algorithm (page 493) and the event $\{I = i^1, L = l^1\}$?

C) We now look at the Gibbs chain created by sampling $P(G, S, D | I = i^1, L = l^1)$ from the mentioned network. We define the two states x_1, x_2 to hold the particles $\xi[1], \xi[2]$. Compute the transition values $\tau(x_1 \rightarrow x_2)$ and $\tau(x_2 \rightarrow x_1)$ given by the algorithm (page 506), assuming the chosen variables order for sampling is $G \rightarrow D \rightarrow S$.