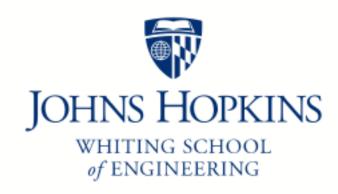
Johns Hopkins Engineering 625.464 Computational Statistics

A Gibbs Sampling Example

Module 6 Lecture 6C



Gibbs Sampling A Stream Ecology Example

Y = (Y1, ..., Yc) - denotes the countsob insects of different classes P = (P1) ... , P2) - denote & the probdy each class & depends on 01,000 N-denotes the random total # of insects collected of depends on parameter 2.

Want to compare two test statistics Ti(Y) and T2(Y)

The Stream Ecology Model

$$(Y_{1},Y_{2},Y_{3})$$
 $(N=n_{1}P_{1}=P_{1},P_{2}P_{2},P_{3}=P_{3})$
 $\sim Maltinomial (n_{1}P_{2}P_{2},P_{3})$
 $(P_{1},P_{2},P_{3}) \sim Dirichlet (x_{1})x_{2}x_{3}$
 $N \sim Poisson (7)$
How to sample (Y₁,Y₂,Y₃)?
 $Y_{1}+Y_{2}+Y_{3}=N$
 $Y_{1}+P_{2}+P_{3}=1$
 $Y_{1}=(Y_{1},Y_{2},P_{1},P_{2},N)$
 $Y_{1}+P_{2}+P_{3}=1$
 $Y_{1}=(Y_{1},Y_{2},P_{1},P_{2},N)$

Conditionals?

2 N, Y, Y2, Y3, B, R2, B3 (Y1, Y2, Y3) (N=n, Pi-Pi, Pz=Pi, B-Pi)~ (Multinomial) (n, Pi, Pz, Pz) $(P_1, P_2, P_3) (N=1, 1/24, 1/2=42)$ ~ Dirichlet (yitan, yztaz, n-y-Jzt dz)

N-y,-y2 (1-3,3/2-y2, R=P,P2-P2) ~ Poisson () (1-pi-P2))

The Full Univariate Conditionals