

Collapsed Gibbs for LDA

Model

$$p(\theta_d) = \text{Dir}(\beta)$$

$$p(\phi_t) = \text{Dir}(\alpha)$$

$$p(z_{dn} | \theta_d) = \Theta_{dz_{dn}}$$

$$p(w_{dn} | z_{dn}, \Phi) = \Phi_{z_{dn} w_{dn}}$$

Can compute analytically

$$p(\Theta | Z)$$

$$p(Z) = \int p(Z | \Theta) p(\Theta) d\Theta$$