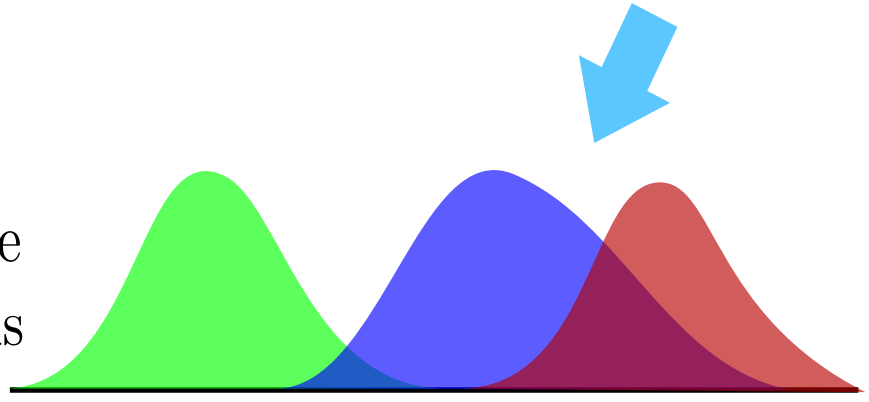
Prior:

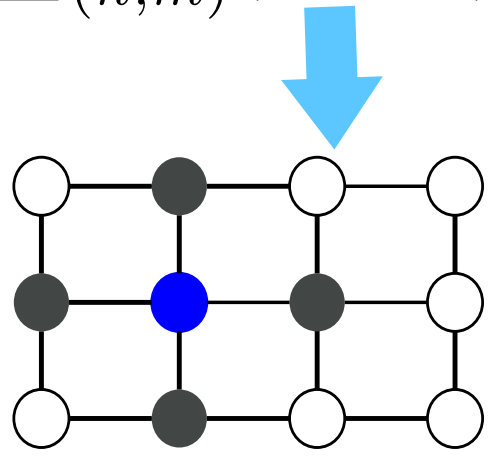
$$p(\mathbf{z}) = \frac{1}{C} \exp\left(\sum_{n=1}^{N} \sum_{k=1}^{K} z_{nk} \log \pi_{nk} + \beta \sum_{(n,m)} \langle z_n, z_m \rangle\right)$$

K = 2 (FG)
K = 3 (BG)

$z_{nk}$: indicator variable
$(n, m)$: neighbor voxels



mixture model



MRF

Likelihood: $p(\mathbf{x}|\mathbf{z}) = \prod_n p(x_n|z_n) = N(x_n; \mu, \sigma^2)$