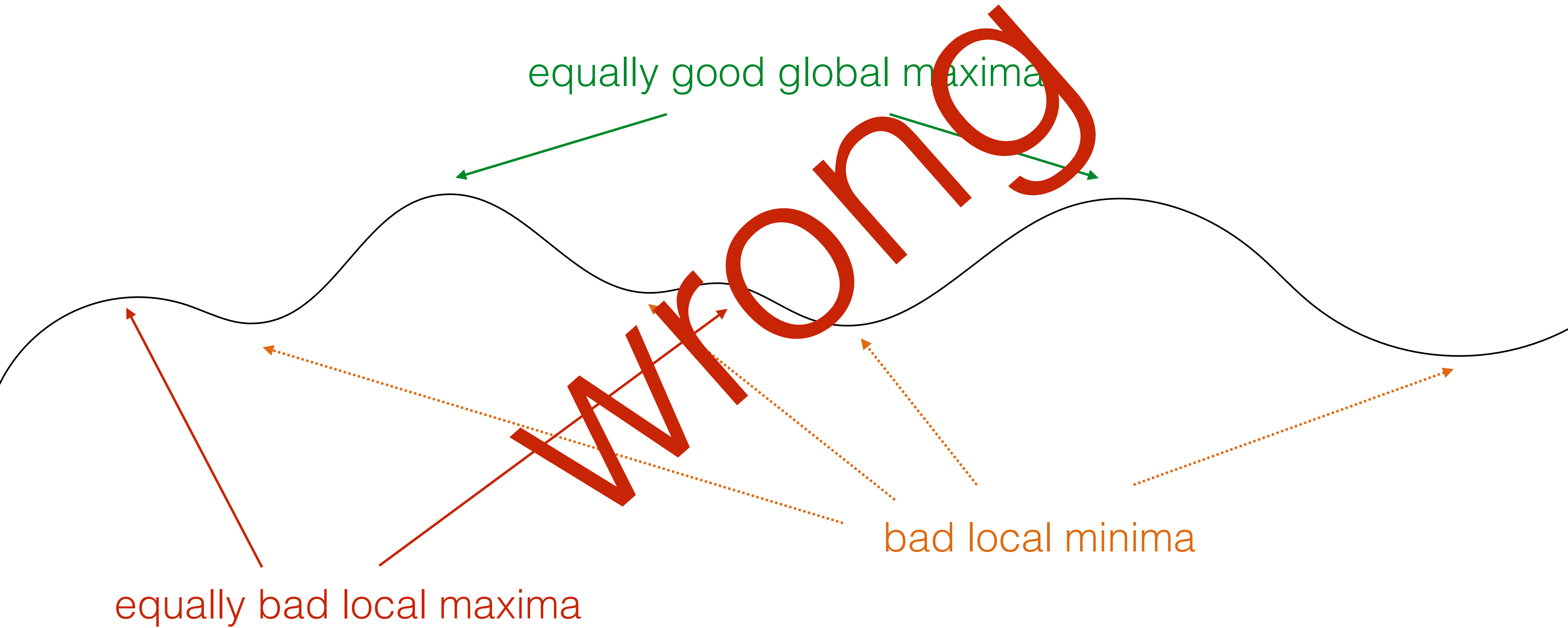
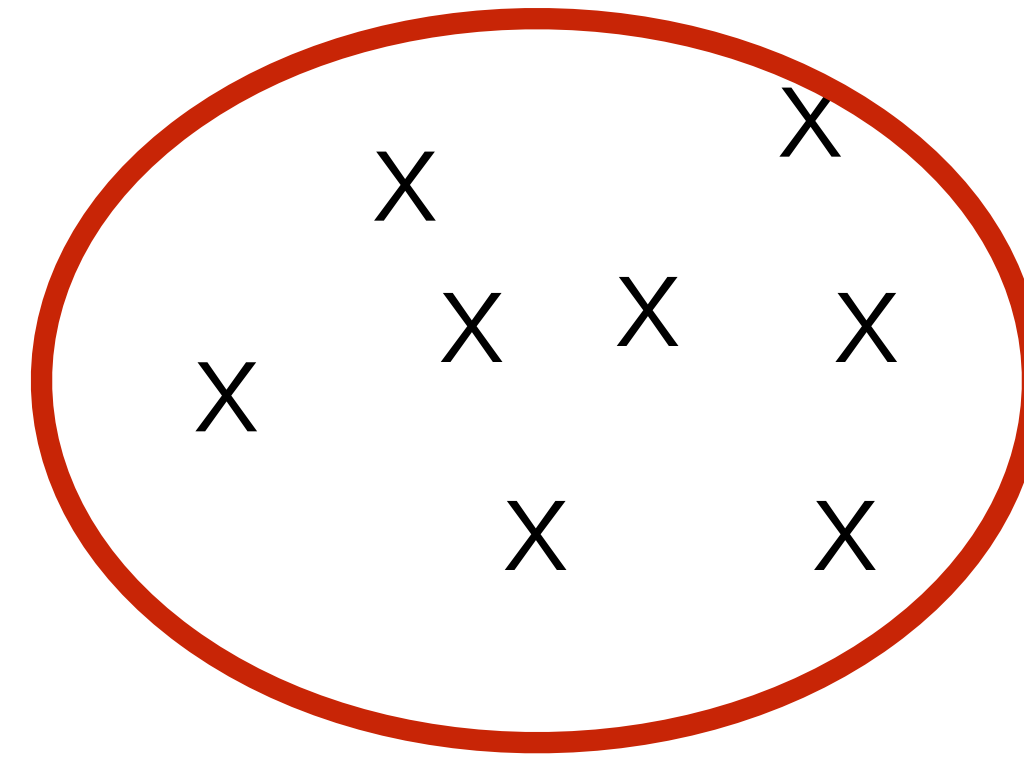
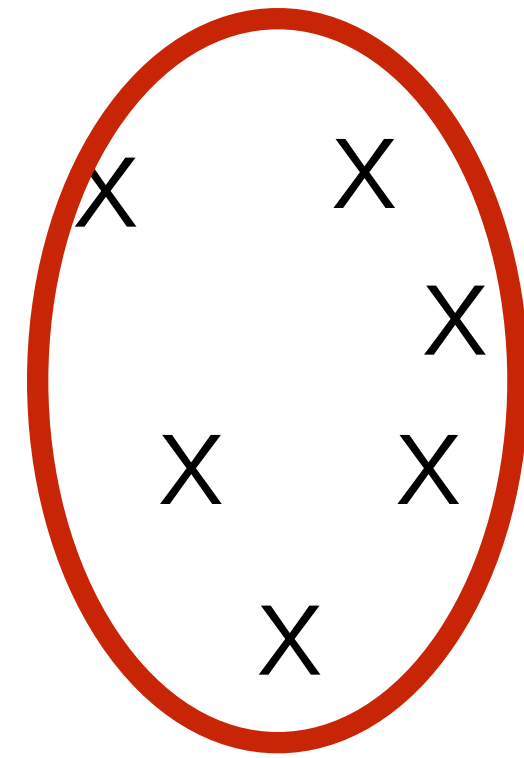


GMM Degeneracy

Machine Learning
CSx824/ECEx242
Bert Huang
Virginia Tech

EM Likelihood Landscape

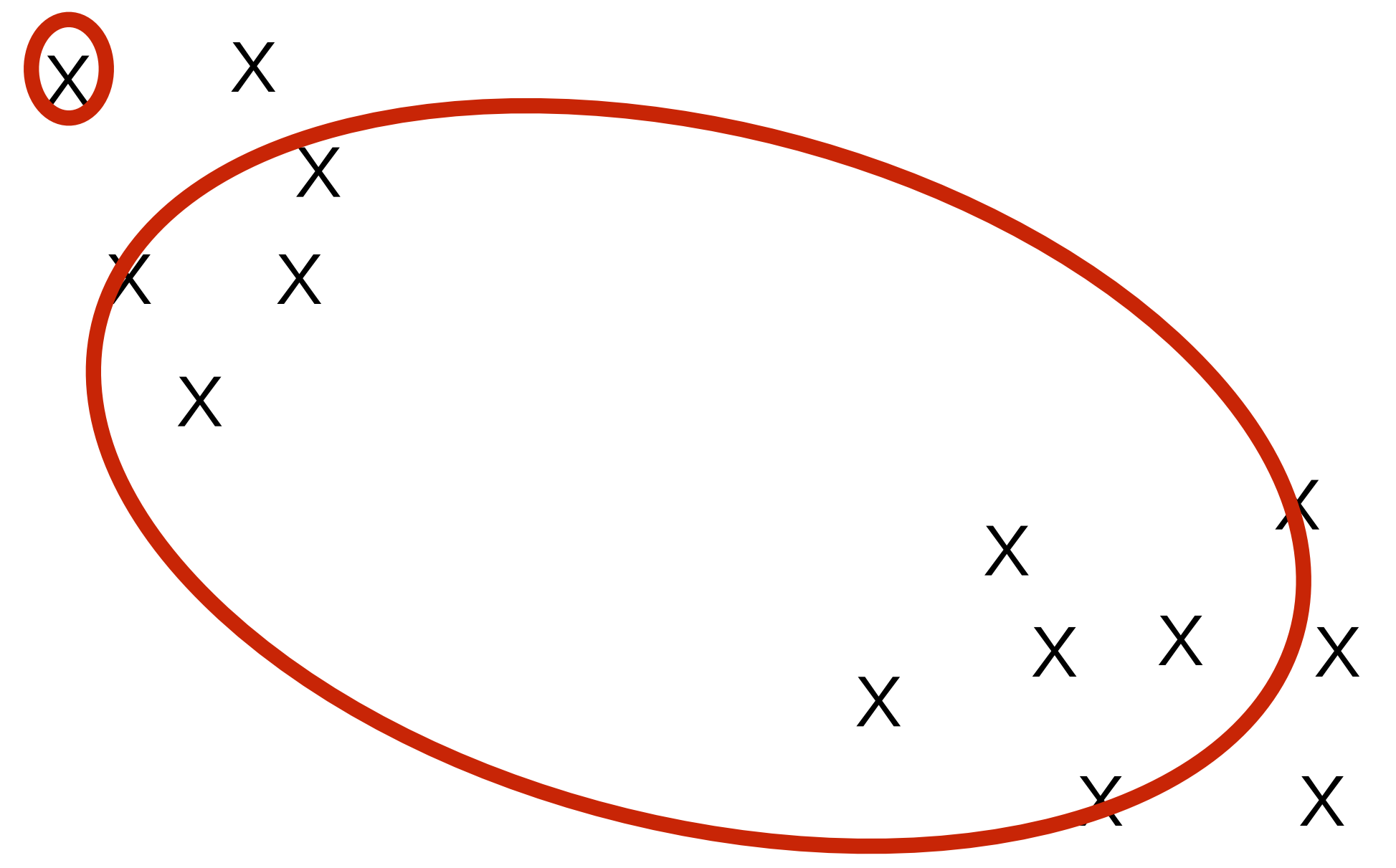




Global maximum?

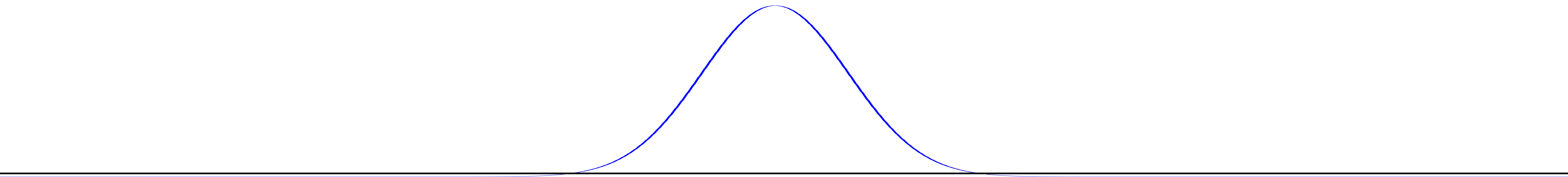
$$\Sigma_c \rightarrow [0]$$

$$L \rightarrow \infty$$

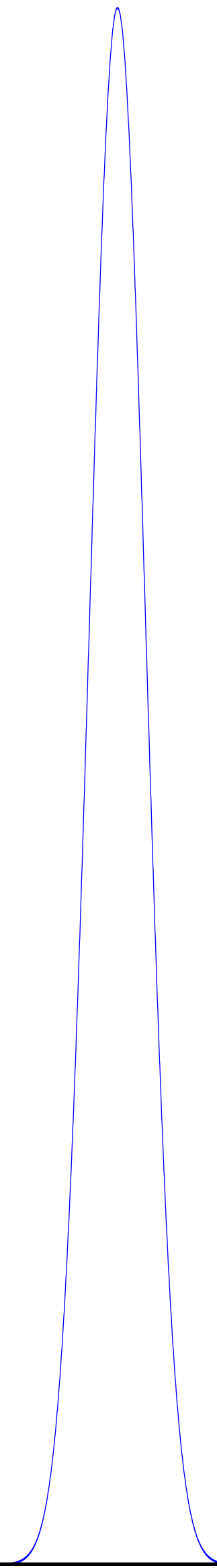


$$\sum_{i=1}^n \log \sum_{c=1}^K p(c) \frac{1}{\sqrt{2\pi |\Sigma_c|}} \exp \left(-\frac{1}{2} (x_i - \mu_c)^\top \Sigma_c^{-1} (x_i - \mu_c) \right)$$

$$\int_{-\infty}^{\infty} p(x) dx = 1$$



$$\int_{-\infty}^{\infty} p(x) dx = 1$$



$$\int_{-\infty}^{\infty} p(x) dx = 1$$

Fixes

- Good initialization
- Constrain covariance to have some bandwidth on each dimension