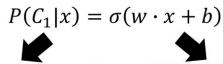
Discriminative v.s. Generative



directly find w and b



Will we obtain the same set of w and b?

Find μ^1 , μ^2 , Σ^{-1}

$$w^{T} = (\mu^{1} - \mu^{2})^{T} \Sigma^{-1}$$

$$b = -\frac{1}{2} (\mu^{1})^{T} (\Sigma^{1})^{-1} \mu^{1}$$

$$+ \frac{1}{2} (\mu^{2})^{T} (\Sigma^{2})^{-1} \mu^{2} + \ln \frac{N_{1}}{N_{2}}$$

The same model (function set), but different function is selected by the same training data.

Generative v.s. Discriminative

- Benefit of generative model
 - With the assumption of probability distribution, less training data is needed
 - With the assumption of probability distribution, more robust to the noise
 - Priors and class-dependent probabilities can be estimated from different sources.