

# 机器学习复习12

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## Linear Discriminant Analysis

(寻找最佳特征的办法)

### 线性判别分析

$$y^{(i)} = g(\theta)^T x^{(i)} \quad (g \text{ 为 sigmoid 函数})$$

$$J(w) = |\tilde{\mu}_1 - \tilde{\mu}_2| = |w^T (\mu_1 - \mu_2)|$$

$$\text{散列值: } S_i^2 = \sum_{y \in \mathcal{U}} (y - \tilde{\mu}_i)^2 \quad \left\{ \begin{array}{l} \text{越大越分散} \\ \text{越小越集中} \end{array} \right.$$

$$S_i = \sum_{x \in \mathcal{U}_i} (x - \mu_i)(x - \mu_i)^T$$

$$S_w = S_1 + S_2$$

$$J(w) = \frac{w^T S_B w}{w^T S_w w}$$

$$\Rightarrow w = S_w^{-1} (\mu_1 - \mu_2)$$

### 线性判别分析

$$y_i = w^T x_i$$

$$J(w) = \frac{|S_B|}{|S_w|} = \frac{|w^T S_B w|}{|w^T S_w w|}$$