



This gives a plane

$$y(x) = \sum_{i=1}^n a_i t_i k(x, x_i) + b$$

a function defined on x -testing
with training example

finding the decision boundary

hyperplane

you need to solve

$$\max \sum_{i=1}^m a_i - \frac{1}{2} \sum_{i=1}^m \sum_{j=1}^m a_i a_j k_i k_j k(x_i, x_j)$$

$$\text{s.t. } a_i \geq 0$$

$$\sum_{i=1}^m a_i t_i = 0$$

$$k(x_i, x_j) = \phi(x_i)^T \phi(x_j)$$

$$b = \frac{1}{N_S} \sum_{i \in S} \left(t_i - \sum_{j \in Z(x_i, x_i)} a_j k_j \right)$$

$$e^{-\frac{\|x_i - x_j\|^2}{2\sigma^2}}$$

k can be any famous kernel

disadvantage: Too many training examples - you need to compute $O(n^2)$
no. of training examples