target class

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 & ith training example

finding the decision boundary

hyperplane

you need to solve

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

$$s.t. \; a_i \geq 0$$

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

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

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

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

k can be any famous kernel

disadvantage : Too many training examples - you need to compute $O(n^2)$

no of training examples