What

kernel function

$k(x, x') = \phi^T(x) \cdot \phi(x') = \langle \phi(x), \phi(x') \rangle$.

$\forall (x, x')$ $\exists \phi : x \to z$

s.t. $k(x, x') = \phi^T(x)\phi(x')$

只保证 $k(x, x')$ 是一个核函数

$k(x, x') = \exp\{-\frac{(x-x')^2}{2\delta^2}\}$. x, x' 为样本.

代入可得 $k(x, x')$，即 $\phi^T(x)\phi(x')$ 可得.

工作方式

① embedding data in a vector space (with more high dim)

② look for (linear) relations in such space.

一些想法

Q. ϕ neccessary A. Not Necessary

Q. can we only employ K? A. Yes.

Q. what kind of K can be used?

A. Finitely positive semi-definite

Q. 给定ϕ，可以找到K，在特征空间计算点积吗? A. Yes.

Q 给定K，我们能构造特征空间H吗? A. Yes