Practice Problems

Apr 6th 2021

1. Suppose you have 3 data points $x_1 = (1, 2)$, $x_2 = (3, 1)$ and $x_3 = (0, 1)$ and a kernel function $k(x, y) = (<x, y> +2)^2$

   (a) What is the dimension of the feature space F induced by the kernel, and what is the kernel-induced function $\Phi : X \to F$?

   (b) Calculate $< \Phi(x_1), \Phi(x_2) >_F$ in the feature space.

   (c) Calculate the distance between all the data points in the feature space.

References

[SC04] Shawe-Taylor, J. and Cristianini, N. 2004 Kernel Methods for Pattern Analysis. Cambridge University Press.