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Machine Learning with Python-From Linear Models to Deep Learning

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[Dates](#)

[Discussion](#)

[Resources](#)

[Home](#) [Course](#) / [Unit 2 Nonlinear Classification, Linear regression, Collaborative Filtering \(2 weeks\)](#) / [Lecture 6. Nonlinear Classification](#)

[< Previous](#)



[Next >](#)

7. The Radial Basis Kernel

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The Radial Basis Kernel

[Start of transcript. Skip to the end.](#)



All right.
So now let's take a more interesting example
to illustrate the power that you get
from incorporating
kernel function.

OK?

Now, you can show that this here,



Video

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Calculating the Radial Basis Kernel

1/1 point (graded)

Recall from the video above that the **radial basis kernel** K is given by

$$K(x, x') = e^{-\frac{1}{2}\|x-x'\|^2}$$

Let

$$x = [1, 0, 0]^T$$

$$x' = [0, 1, 0]^T.$$

Compute the radial basis kernel $K(x, x')$.

☐ $\frac{\sqrt{2}}{2}$

☒ e^{-1}

☐ $e^{-\frac{1}{2}}$

☐ $e^{\frac{\sqrt{2}}{2}}$



Solution:

$$K(x, x') = e^{-\frac{1}{2}\|x-x'\|^2} = e^{-\frac{1}{2}(2)} = e^{-1}.$$

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You have used 1 of 2 attempts

i Answers are displayed within the problem

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Topic: Unit 2 Nonlinear Classification, Linear regression, Collaborative Filtering (2 weeks):Lecture 6. Nonlinear Classification / 7. The Radial Basis Kernel

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- I really wish the female teacher carries all the remaining courses.**
I get confused with what the male teacher is trying to express (which gets really frustrating). The female teacher explains very well on th... 1
- Helpful video**
https://www.youtube.com/watch?v=Qc5JyLW_hns 2
- Radial basis function parameter S**
I have seen other material where instead of multiplying by $(1/2)$ the RBF is multiplied by $(1/s^2)$. Is it a good practice to just use $(1/2)$ for... 2
- [STAFF] Why is the radial kernel infinitely dimensional in terms of vectors??**
There is no explanation in the video. Should we just believe and accept? Could you give some intuition or additional materials to help us... 4
- Fix please**
Hi, You should not be able to select several options as an answer here, Thanks. 2
- Random forests**
Why are random forests mentioned in this section? 2
- What about issues of overfitting or generalization with Radial Basis Kernel Perceptron Algorithm?**
As the feature vector representation for radial basis kernel is infinite dimensional, we are effectively using infinite dimensional feature v... 3
- What is the mapping function $\Phi(x)$ for radial basis kernel?** 5
- Unit2-7 Infinitely powerful Kernel**
Hi, At video 2:15, "Now, since this kind of function, radial basis kernel, involves polynomial features up to infinite order, it is actually infin... 3

< Previous

Next >

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