

<u>Unit 2 Nonlinear Classification</u>, <u>Linear regression, Collaborative</u>

<u>Course</u> > <u>Filtering (2 weeks)</u>

7. The Radial Basis Kernel

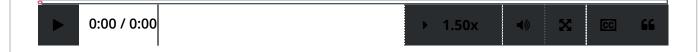
> Lecture 6. Nonlinear Classification >

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# 7. The Radial Basis Kernel The Radial Basis Kernel





#### 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

$$K\left(x,x^{\prime}
ight)=e^{-rac{1}{2}\left|\left|x-x^{\prime}
ight|
ight|^{2}}$$

Let

$$x = egin{bmatrix} 1,0,0\end{bmatrix}^T$$

$$x' = egin{bmatrix} 0, 1, 0 \end{bmatrix}^T$$
.

Compute the radial basis kernel  $K\left( x,x^{\prime}\right) .$ 





$$e^{-rac{1}{2}}$$

$$\Box e^{rac{\sqrt{2}}{2}}$$



**Solution:** 

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

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You have used 1 of 2 attempts

**1** Answers are displayed within the problem

# Discussion

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Overfitting with Radial Basis Kernel Does Radial Basis Kernel turn to overfit as it's so flexible that it can fit even all noises?	1
? Could anyone explain what boostrap sample mean?  I heard about the term boostrap sample many times but still do not understand what does it	1
How do I get the final value for theta when using this kernel? Since it is infinite-dimensional, in this case.	7
Why Radial Basis Kernel works This helped me to understand how it works: https://www.youtube.com/watch?v=Z2_yh2sice8	1
Additional Materials Is there any additional materials on non-linear classifier for someone with poor mathematica	3
Regularization Is it still necessary to implement regularization when we work with the radial basis kernel? If	2
? <u>ls this a valid kernel?</u>	2
? SVM vs. Kernel functions  For a given non-linear classification task, when should we use Kernel perceptron and when s	2
● 6.7 Segment notes  Lommunity TA	1

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What does the radial basis kernel gives us, it seems that it neither give us
alpha j's nor theta^(i)?

Transcription errors
3:04 "algorithm" instead of "[?applet. ?]" 5:32 "So previously, we discussed how perceptron al...

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