

# The Radial Kernel (RBF)

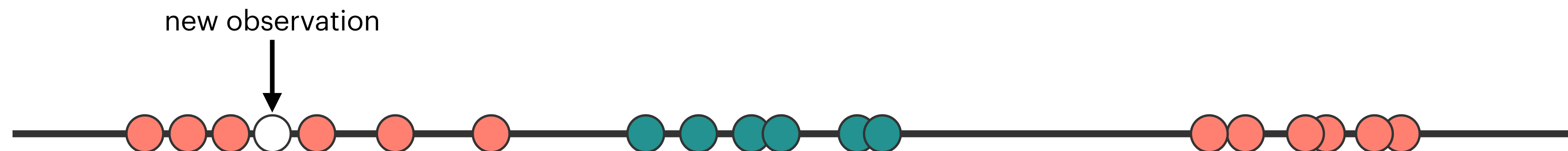
## The Radial Kernel

$$K(a, b) = e^{-\gamma(a - b)^2}$$

projects to **infinite dimensional** space  
works similar to nearest neighbors classifier

the amount of influence one observation has on  
another is a function of the squared distance

$\gamma$  scales the squared distance to determine the strength of influence  
(determined by **cross validation**)



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we can use the Polynomial Kernel to get the intuition  
behind how Radial Kernel works in infinite dimensions

$$K(a, b) = (a \cdot b + r)^d$$

$$\text{set } r = 0 \implies (a \cdot b)^d = a^d \cdot b^d$$

$$\text{set } d = 1 \implies (a) \cdot (b)$$

