$Euclidean\ distance:$

$$d\left(x,x^{(i)}\right)=\left|\left|x-x^{(i)}\right|\right|^{2}=\sqrt{\sum_{i=1}^{d}(x-x^{(i)})^{2}}$$

$define\ the\ function\ by\ its\ square:$

$$d^{2}\left(x,x^{(i)}\right)=\sum_{i=1}^{d}\left(x-x^{(i)}\right)^{2}$$

$In\ terms\ of\ dot\ product:$

$$d^{2}\left(x,x^{(i)}\right)=x^{T}x-2x^{T}x^{(i)}+x^{(i)^{T}}x^{(i)}$$

$Because\ for\ Mercer's\ theorem, if\ K\ is\ positive\ definite, k\left(x^{(i)},x^{(j)}\right)\ can\ be\ written\ as$

$dot\ product\ \emptyset\left(x^{(i)}\right)^{T}\emptyset\left(x^{(j)}\right)$

$Thus, kernalize\ the\ classification\ rule\ using\ kernel\ functions:$

$$d^{2}\left(x,x^{(i)}\right)=k(x,x)-2k\left(x,x^{(i)}\right)+k\left(x^{(i)},x^{(i)}\right)$$