





$$\left\{x_i, y_i\right\}_{i=1}^n \in \mathbb{I}$$

 $\epsilon_i \hat{w} w$ 

$$y = w_1 x^2 + w_2 \sqrt{2} x_i + w_3 + \epsilon_i$$

 $x^2$ 

$$x\varphi:\mathbb{R}\to\mathbb{R}^3$$

$$\varphi(x) = [x^2, \sqrt{2x}, 1]$$

$$y_i = w^T \varphi(x_i) + \epsilon$$

 $w = [w_1, w_2, w_3] \varphi(x)$ 

$$\varphi(x)$$

$$\varphi(x_1)^T \varphi(x_2) = [x_1^2, \sqrt{2}x_1, 1]^T . [x_2^2, \sqrt{2}x_2, 1]$$

$$K(x_1, x_2) = (x_1^T x_2 + 1)^d d \in \mathbb{I}$$

$$x_1x_2\mathbb{R}^p\varphi(x_1)\varphi(x_2)$$

$$\varphi(x_1)^* \varphi(x_2) = K(x_1, x_2)$$

 $K(.,.)\mathbb{R}^3$ 







