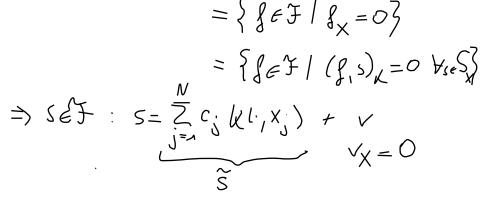
$$S = Span \{ K(\cdot, x_n), -, K(\cdot, x_n) \}$$

$$S = S_X \oplus S_X^{\perp}$$

$$= \{ j \in \mathcal{F} \mid j_X = 0 \}$$



$$\|S_{X}-J_{X}\|_{2}^{2} = \|(\widetilde{S}+v)_{X}-J_{X}\|_{2}^{2}$$

$$= \|\widetilde{S}_{X}-J_{X}\|_{2}^{2} \quad \text{independent}$$

$$\|S\|_{\mathcal{C}}^{2} = (\widetilde{S}+v, \widetilde{S}+v)_{X} = \|\widetilde{S}\|_{\mathcal{C}}^{2} + \|v\|_{\mathcal{C}}^{2}$$

$$\geq \|\widetilde{S}\|_{\mathcal{C}}^{2} \quad \text{with} \quad u=u \text{ if } v=0$$

$$\Rightarrow S = \widetilde{S} = \sum_{\widetilde{S}=1}^{N} C_{\widetilde{S}}(kl, k)$$

$$\in S_{X} \quad \widetilde{S}=1$$

$$\frac{3}{2} R(h) = E[(h(x)-y)^{2}]$$

$$\frac{1}{2} E[(h(x)-y)^{2}] = R(f)$$

$$E[(4(x1-y)^{2}) = E[(h(x)-f(x)) + (f(x)-y)^{2}]$$

$$= E[(h(x)-f(x))^{2} + 2(h(x)-f(x)) + (f(x)-y)^{2}]$$

$$= E[(h(x)-f(x))^{2} + 2(h(x)-f(x)) + (f(x)-y)^{2}]$$

$$= \frac{\mathbb{E}[(h(x)-((x))^{2}) + \mathbb{E}[(f(x)-y)^{2}]}{+2^{2}} + 2^{2} \frac{\mathbb{E}[(h(x)-f(x))(f(x)-y)^{2}]}{+2^{2}}$$

$$\frac{\mathbb{E}[X] = \mathbb{E}[X|Y]}{\mathbb{E}[X|Y]} = \int_{(Y)} \mathbb{E}[X|Y] = \int_{(Y)} \mathbb{E}[X|Y] = \int_{(X)-f(X)} (f(X)-f(X)) \left(f(X)-f(X)\right) \left(f(X)-f(X)\right) = \int_{(X)-f(X)=0} \mathbb{E}[X|Y] = 0$$

$$= 0 = \int_{(X)-f(X)=0} \mathbb{E}[X|Y] = \int_{(X)-f(X)=0} \mathbb{E}[X|Y] = 0$$

(3 a) Hoelding Is inequality