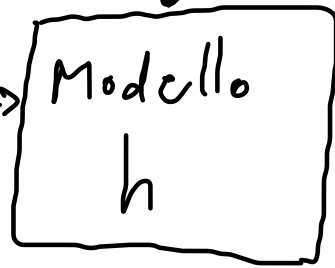


$x \in \mathbb{R}^{d+1}$
 $y \in \mathbb{R}$

Parametri $w \in \mathbb{R}^{d+1}$



$\hat{y} = h(x)$



val. positivo $l(h, (x, y))$

$l(h, (x, y))$

$l(\hat{y}, y)$

$h(x) = w_0 x_0 + w_1 x_1 + \dots + w_d x_d = w^T x$

Rischio atteso : $E[l(h, (x, y))]$

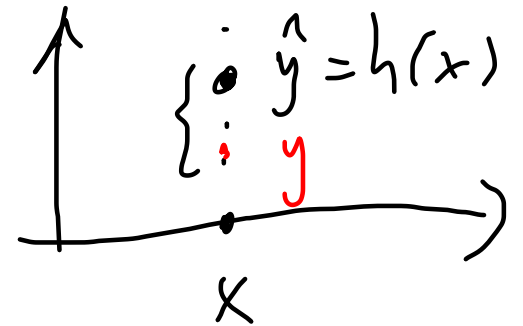
→ Risiko empirico

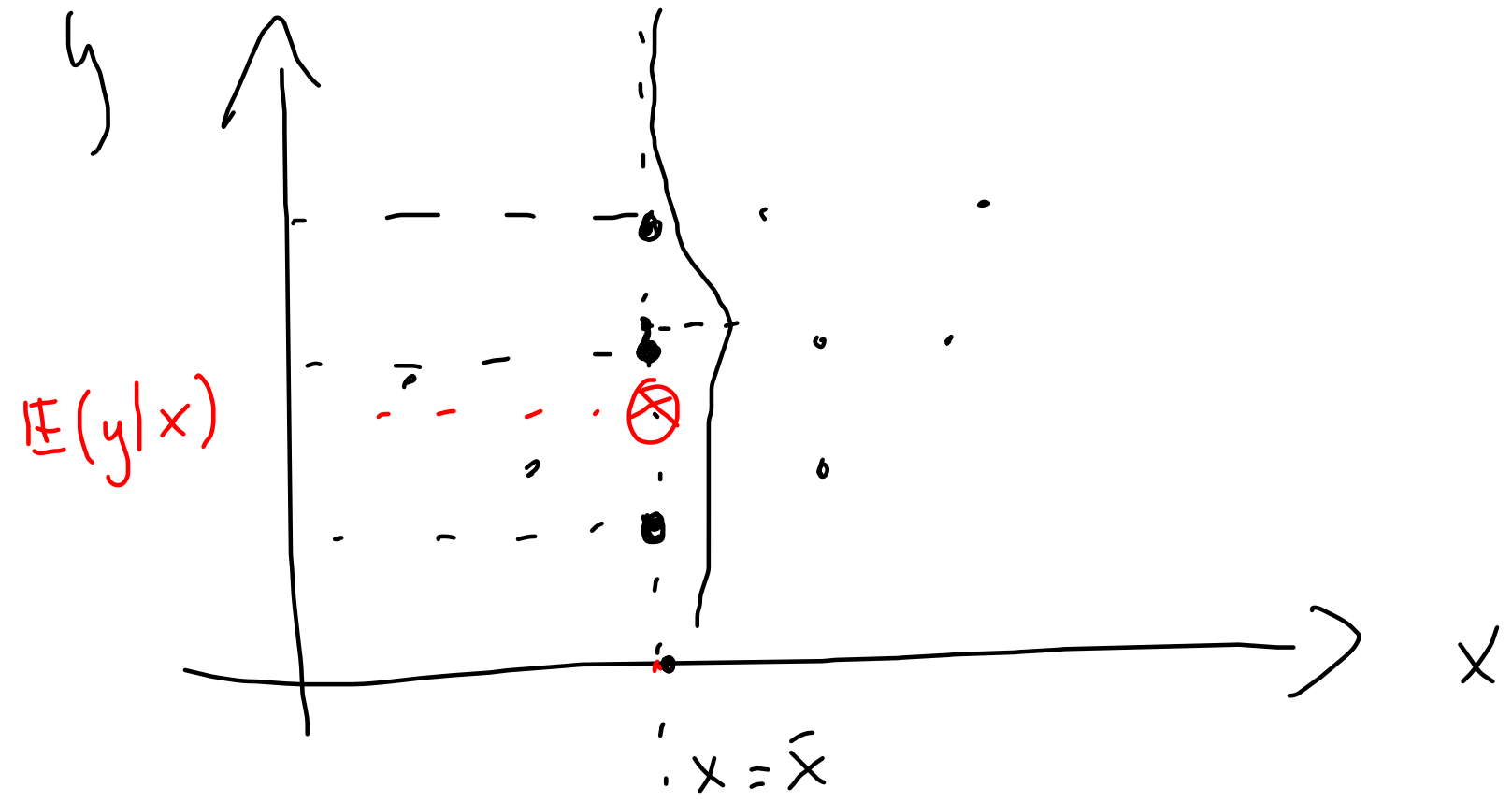
$$L_S(h) = \frac{1}{m} \sum_{i=1}^m \ell(h, (x^{(i)}, y^{(i)}))$$

$$S = \{(x^{(1)}, y^{(1)}), \dots, (x^{(m)}, y^{(m)})\}$$

↳ Regr. lineare

$$\ell(h, (x, y)) = (h(x) - y)^2$$

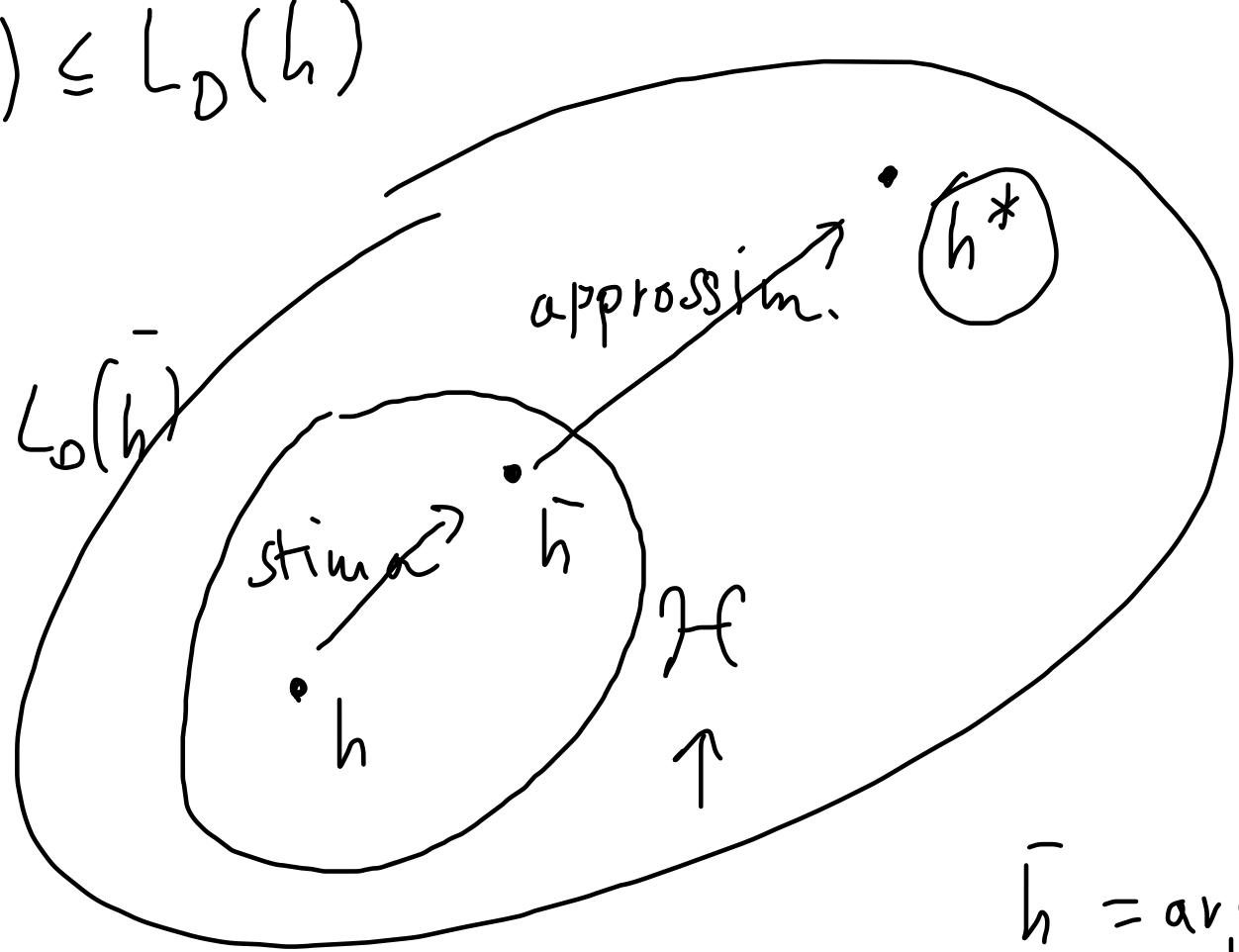




$$L_D(\bar{h}) \leq L_D(h)$$

$$\bar{h} \in \mathcal{Y}^X$$

$$L_D(h^*) \leq L_D(\bar{h})$$

 \mathcal{Y}^X

$$\mathcal{H} \subseteq \mathcal{Y}^X$$

$$\bar{h} = \operatorname{argmin}_{h \in \mathcal{H}} L_D(h)$$

$$L_D(h)$$