18.3.2020

$$w = \sum_{i=1}^{n} \alpha_i \cdot x_i \qquad \phi \longmapsto w_\phi = \sum_{i=1}^{n} \alpha_i \phi(x_i)$$

Predictions:

$$h(x) = \text{sign}(w^T x) \qquad \xrightarrow{\phi} \qquad \text{sign}(w_\phi{}^T \phi(x))$$

$$= \text{sign}\left(\sum_{i=1}^{n} \alpha_i \underbrace{\phi(x_i)^T \phi(x)}_{k(x_i, x)}\right)$$

$$h(x) = \text{sign}\left(\sum_{i=1}^{n} \alpha_i k(x_i, x)\right)$$

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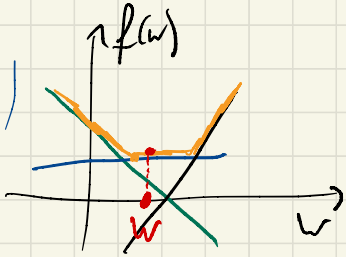
Sps: $f(w) = \max_{(x,b) \in S} (w^T x + b)$




$\nabla_w f(w) = x^*_w$, where

$x^*_w \in \text{argmax}\ (w^T x + b)$

$x : \{(x,b) \in S \text{ for some } b\}$