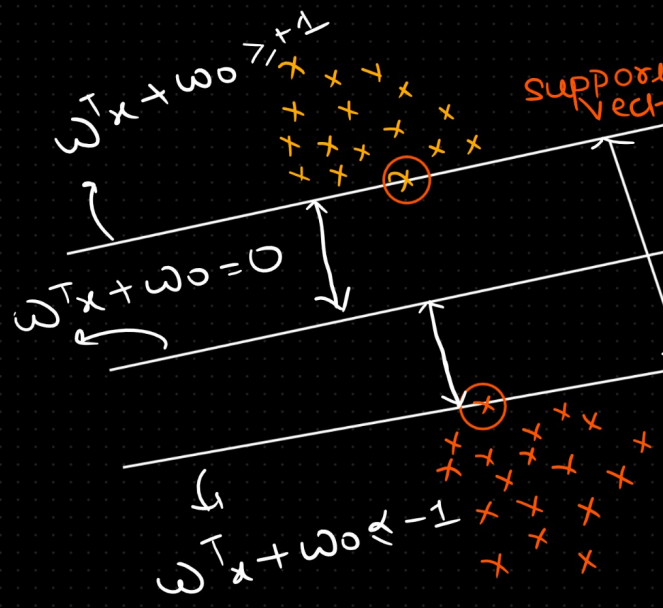
Support Vector Machine



3d, 4d, 5d ___ nd

Equation of a hyperplane

$-a/b$

(1) $y = mx + c$ $\quad -1/b$

$ax + by + c = 0$ — 2D space

$by = -ax - c$

(2) $y = -\frac{a}{b}x - \frac{c}{b}$

$w_1 x_1 + w_2 x_2 + w_0 = 0$ (2D Space)

$w_1 x_1 + w_2 x_2 + w_3 x_3 + w_0 = 0$ (3D Space)

Matrix Multiplication

$w_1 x_1 + w_2 x_2 + w_3 x_3 + \text{---} + w_n x_n +$ (nD Space)

$w_0 = 0$ ——— (3)

(4) — $[w_1 \; w_2 \; w_3 \; w_4 \; \cdots \; w_n]$ $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ \vdots \\ x_n \end{bmatrix}$

$w \cdot x + w_0 = 0$

↳ matrix multiplication

hyperplane

$w^T \cdot x + w_0 = 0$

$$\hat{y} = \begin{cases} +1 & w^T \cdot x + w_0 \geq 0 \\ -1 & w^T x + w_0 < 0 \end{cases}$$

$2x + 3y - 3 = 0$? new set

$(x, y) \rightarrow (2, 3)$

- SVC → support vector Classifier
- SVR → support vector Regressor
  - target → continous