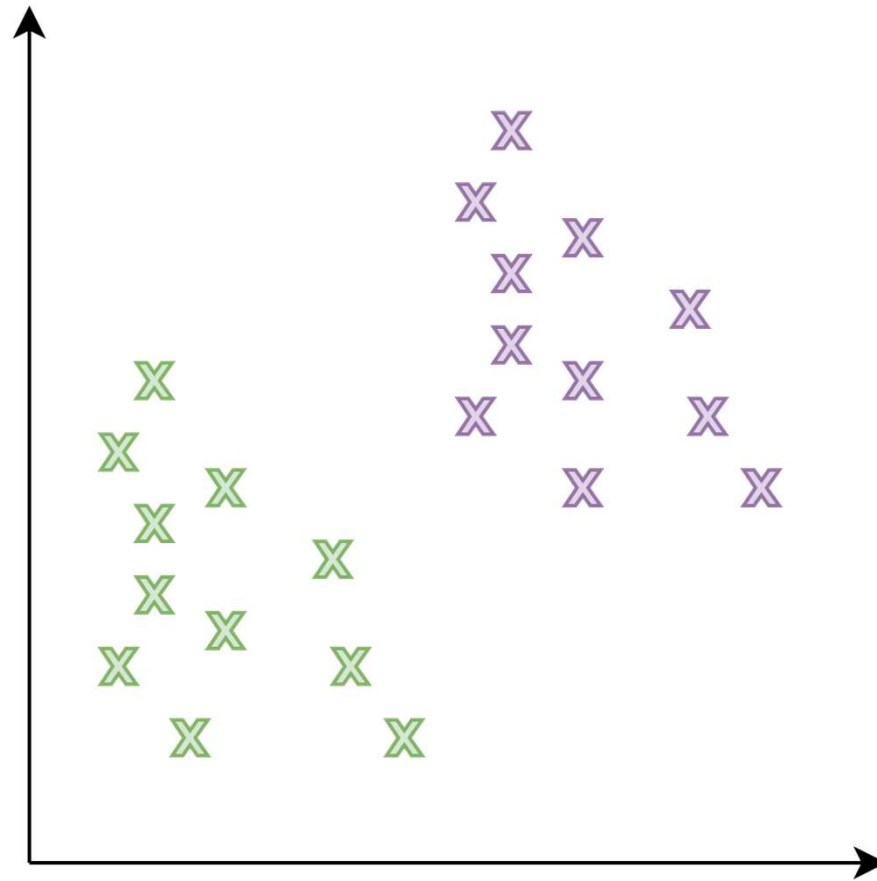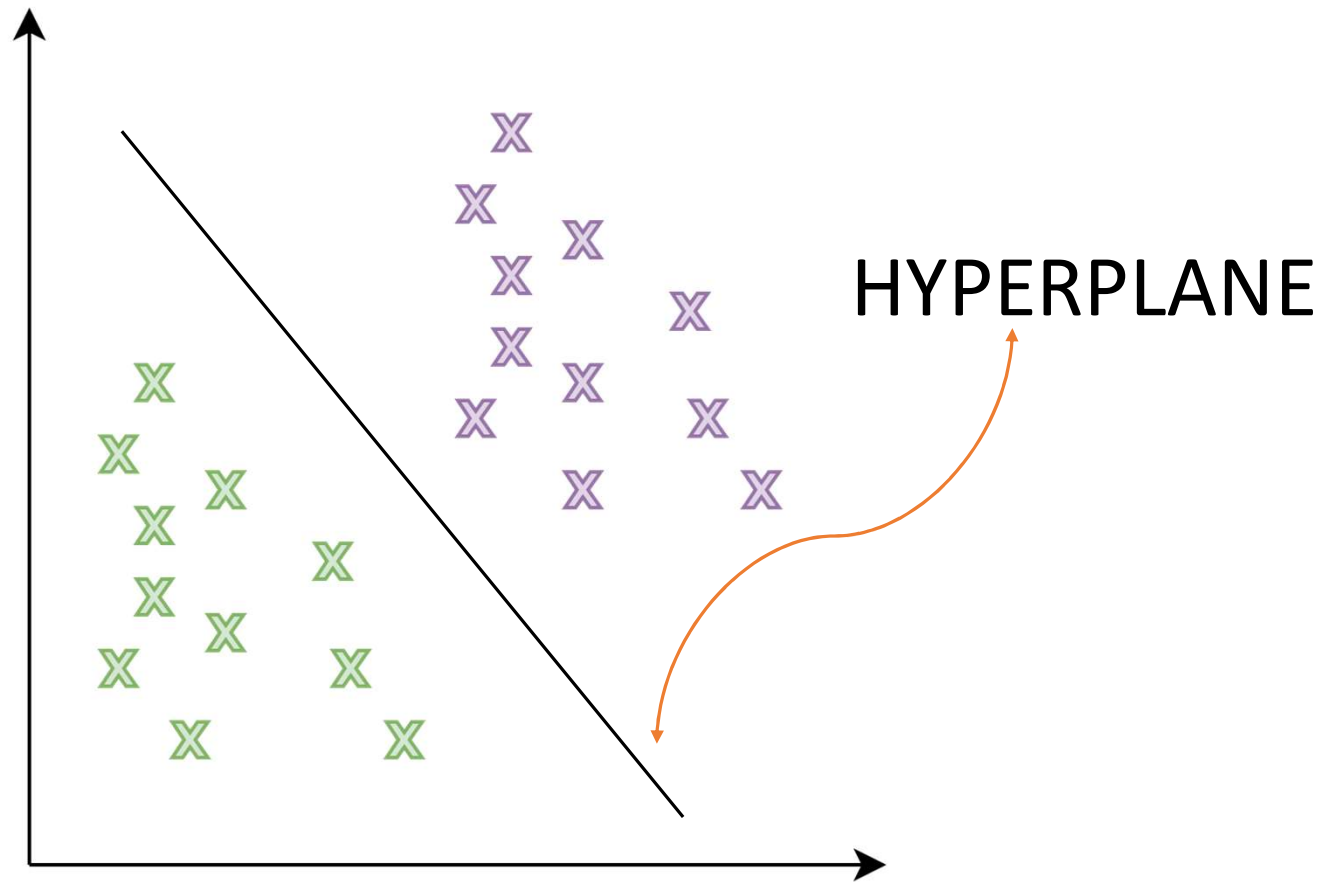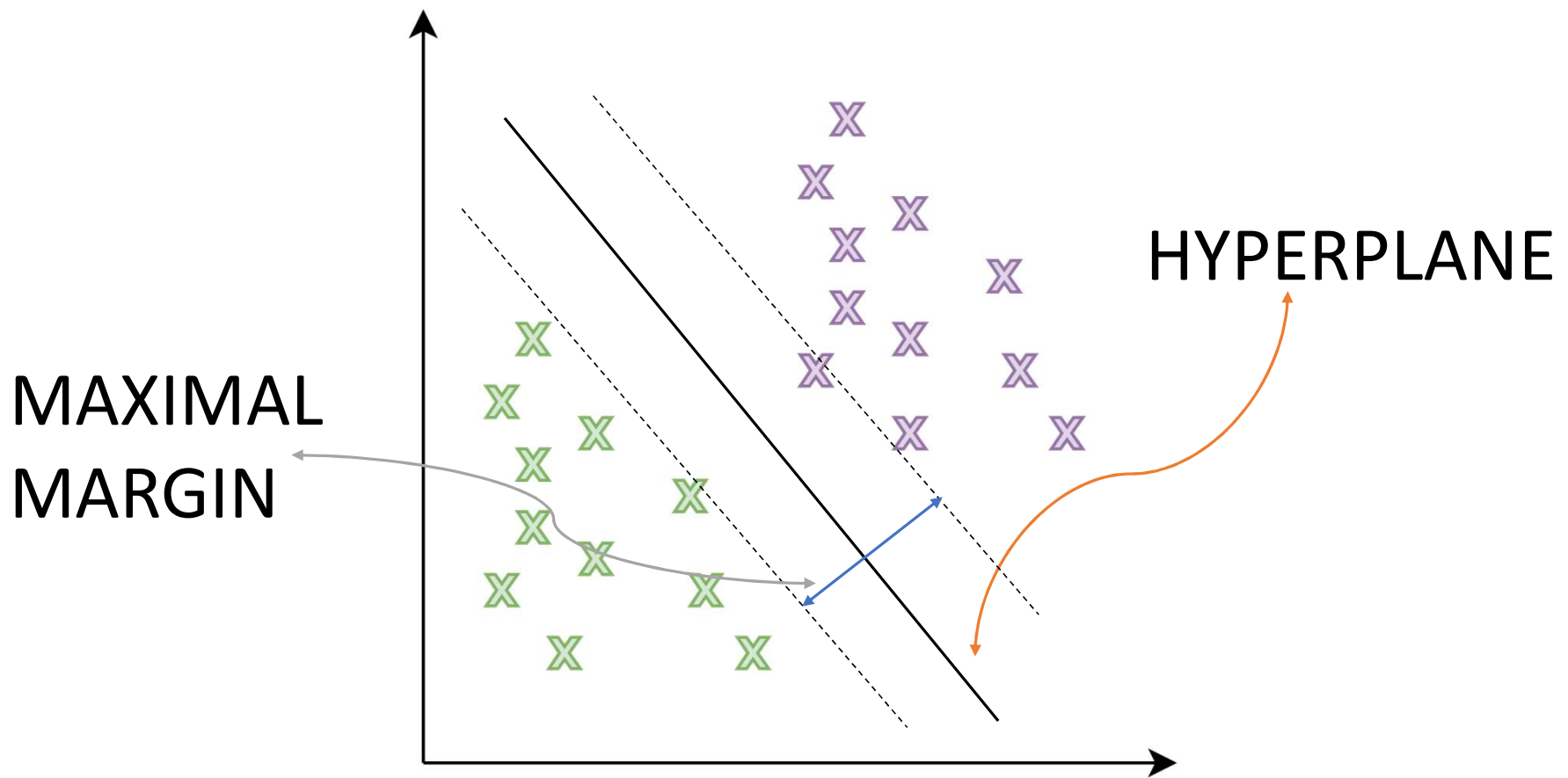# Support Vector Machines

Getting Started with ML – Raunak Joshi

Getting Started with ML ~ Raunak Joshi

HYPERPLANE

Getting Started with ML ~ Raunak Joshi

MAXIMAL MARGIN

HYPERPLANE

SUPPORT VECTORS

MAXIMAL MARGIN

HYPERPLANE

SUPPORT VECTORS

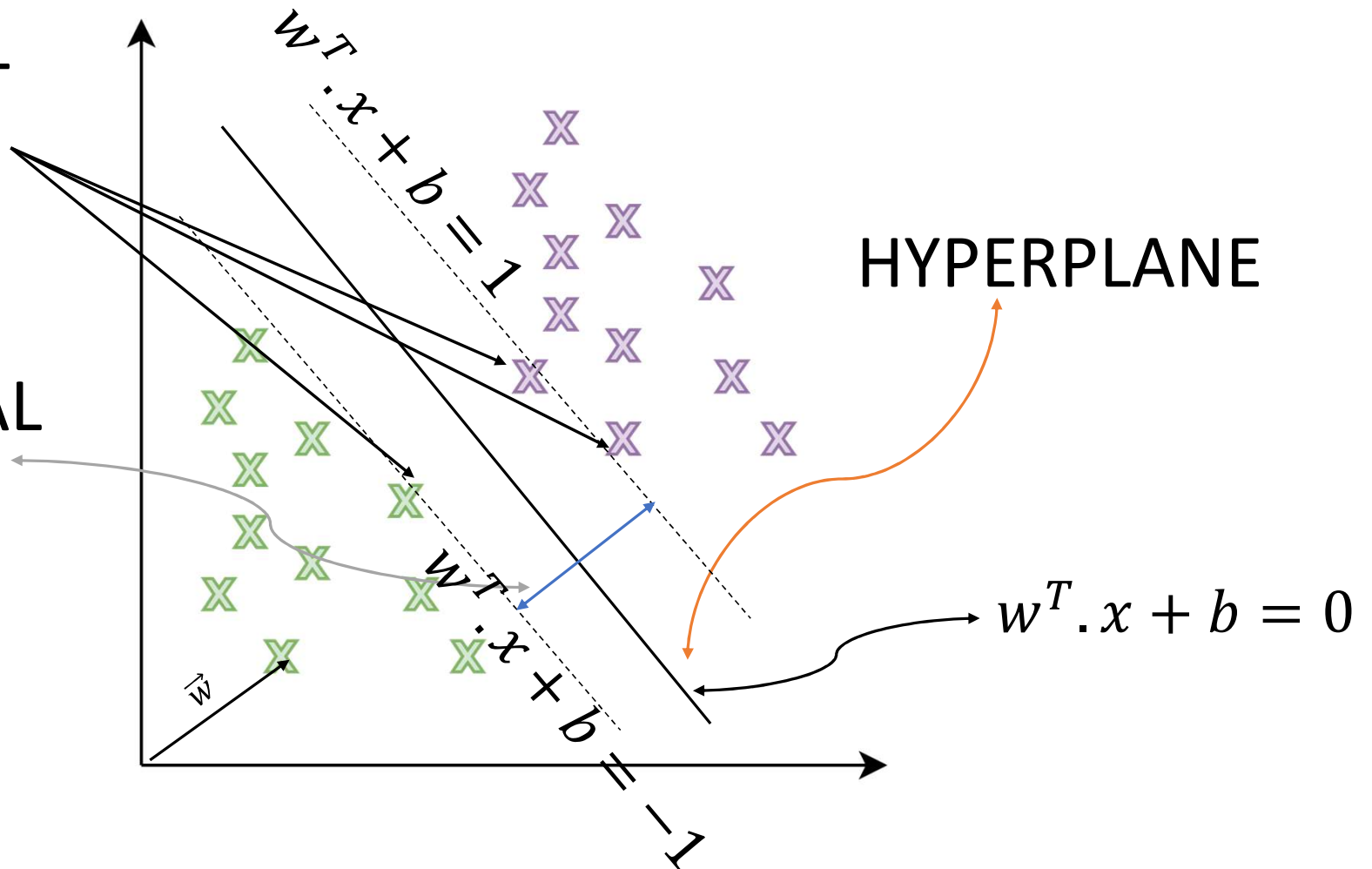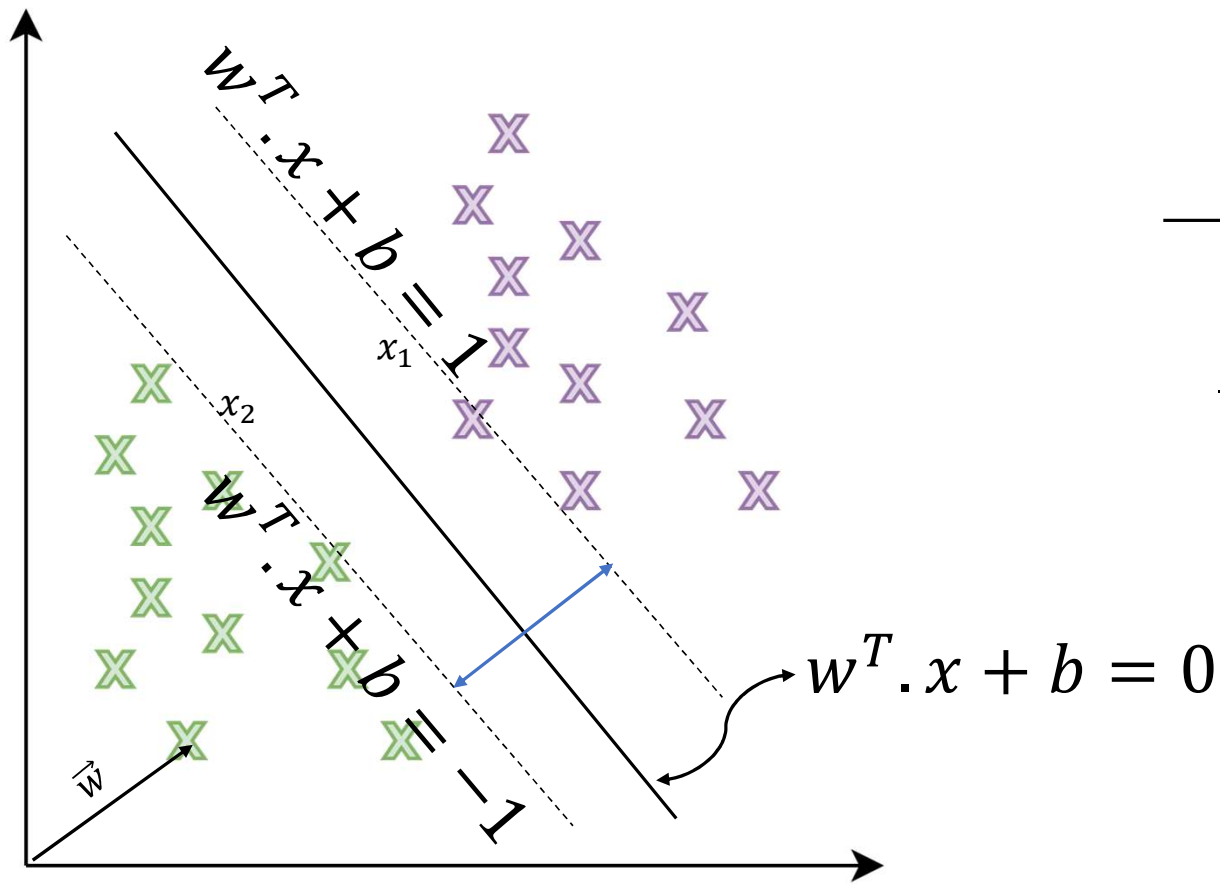MAXIMAL MARGIN

HYPERPLANE

$$w^T.x + b = 1$$

$$w^T.x + b = 0$$

$$w^T.x + b = -1$$

$\vec{w}$
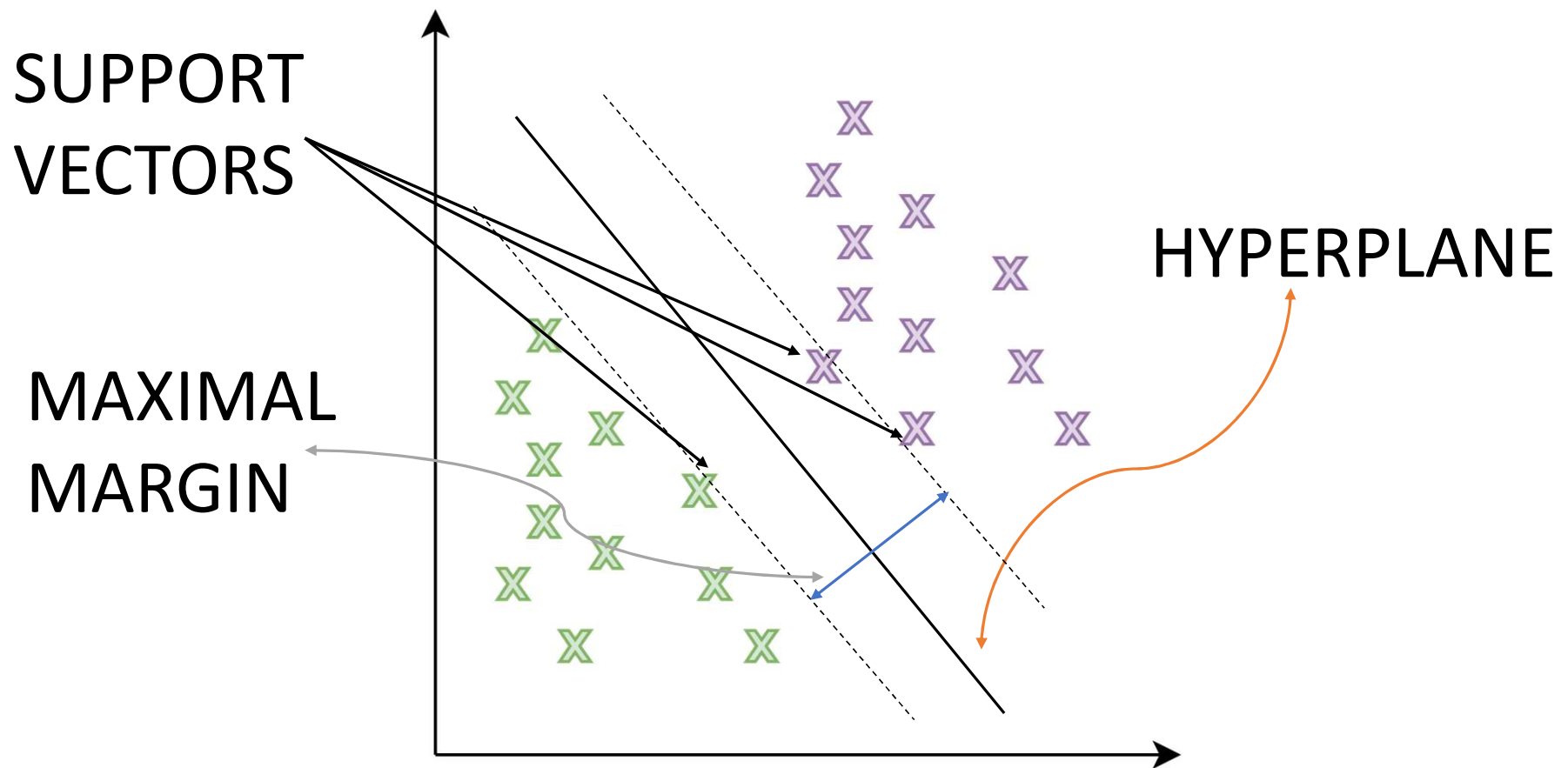
$$w^T.x_1 + b = 1$$
$$w^T.x_2 + b = -1$$
$$\overline{}$$
$$w^T.(x_1 - x_2) = 2$$

$$\frac{w^T}{\|w\|}.(x_1 - x_2) = \boxed{\frac{2}{\|w\|}}$$

$$(w, b) = \max\left(\frac{2}{\|w\|}\right)$$
$$where\ y \geq 0\ if\ correct$$
$$and\ y < 0\ if\ incorrect$$

$$w^T.x + b = 1$$
$$x_1$$
$$x_2$$
$$w^T.x + b = -1$$
$$\vec{w}$$
$$w^T.x + b = 0$$