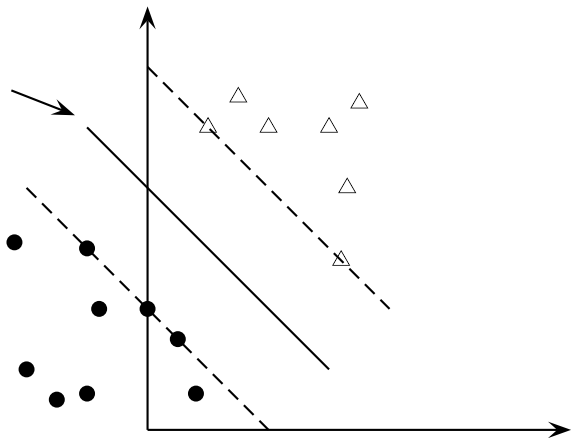
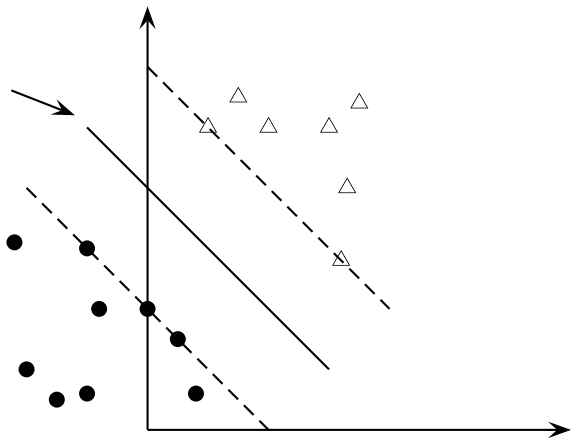


maximum
margin
decision
hyperplane

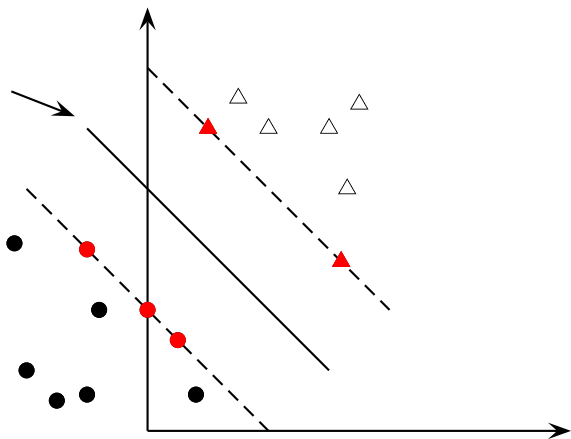


maximum
margin
decision
hyperplane



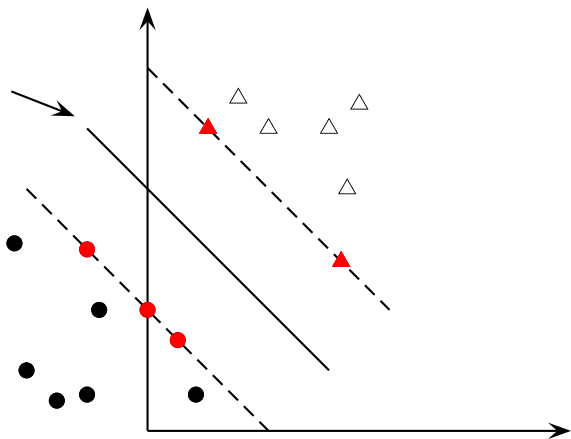
support vectors in red

maximum
margin
decision
hyperplane



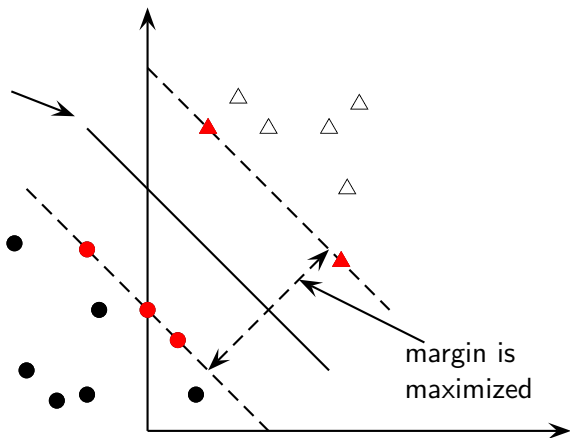
support vectors in red

maximum
margin
decision
hyperplane



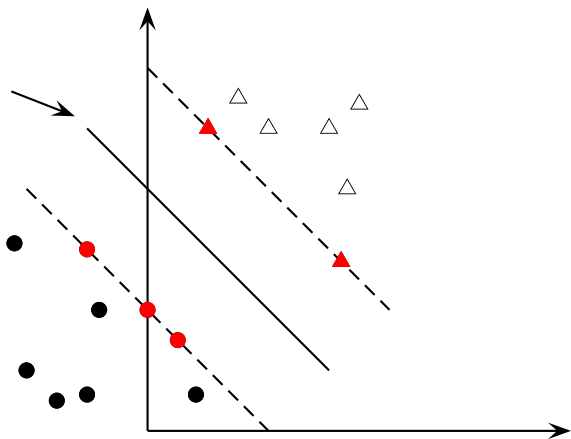
support vectors in red

maximum
margin
decision
hyperplane



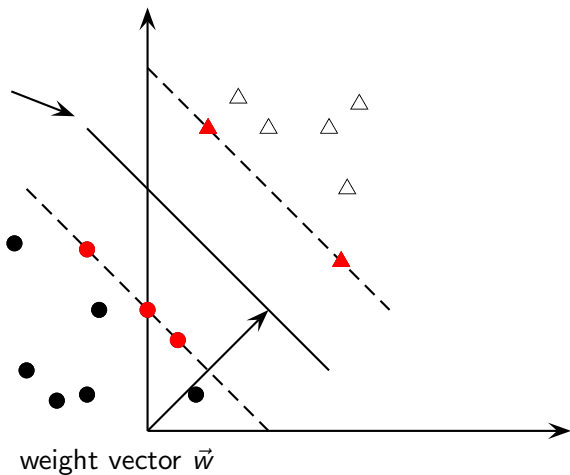
support vectors in red

maximum
margin
decision
hyperplane



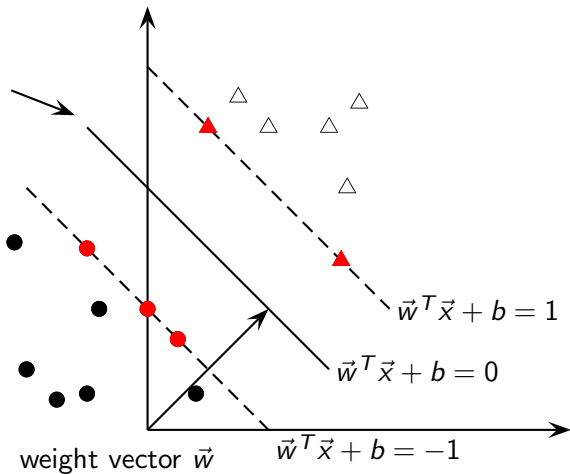
support vectors in red

maximum
margin
decision
hyperplane



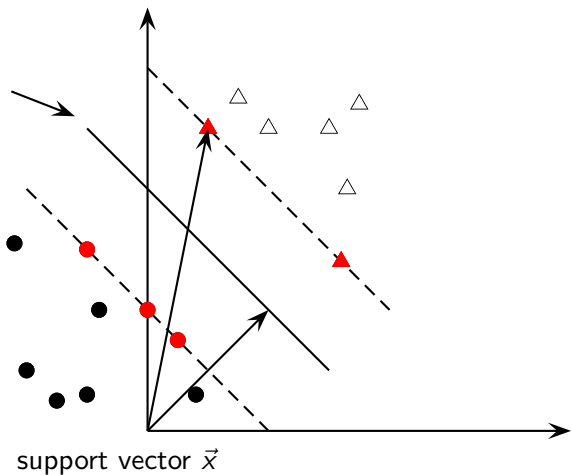
support vectors in red

maximum
margin
decision
hyperplane



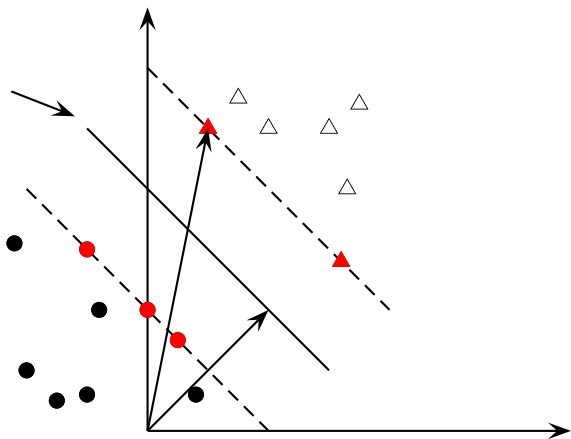
support vectors in red

maximum
margin
decision
hyperplane



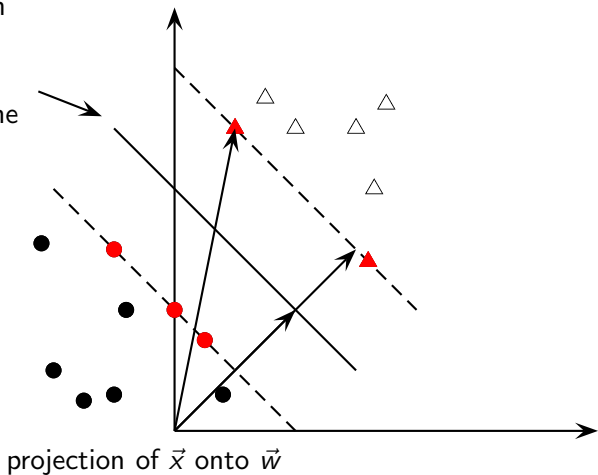
support vectors in red

maximum
margin
decision
hyperplane



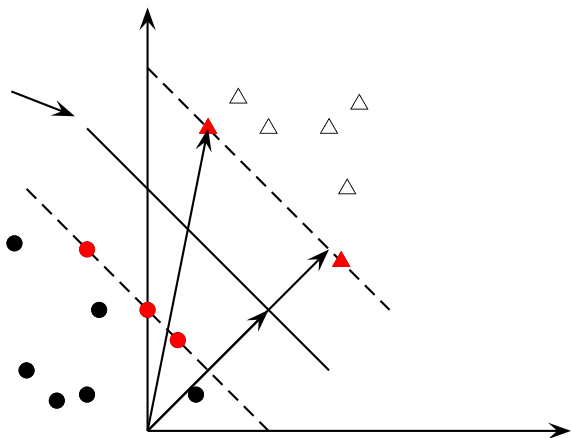
support vectors in red

maximum
margin
decision
hyperplane



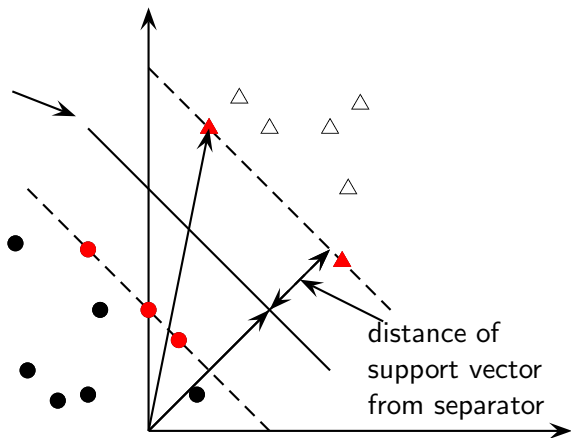
support vectors in red

maximum
margin
decision
hyperplane



support vectors in red

maximum
margin
decision
hyperplane



$$\vec{w}^T \vec{w} + b = 0$$

$$b = -\vec{w}^T \vec{w}$$

$$\frac{b}{|\vec{w}|} = -\frac{\vec{w}^T \vec{w}}{|\vec{w}|}$$

Distance of support vector from separator =
(length of projection of \vec{x} onto \vec{w}) minus (length of \vec{w})

$$\frac{\vec{w}^T \vec{x}}{|\vec{w}|} - \frac{\vec{w}^T \vec{w}}{|\vec{w}|}$$

$$= \frac{\vec{w}^T \vec{x}}{|\vec{w}|} + \frac{b}{|\vec{w}|}$$

$$= \frac{\vec{w}^T \vec{x} + b}{|\vec{w}|}$$