

Estas duas pg devem ser inseridas após a pg 15

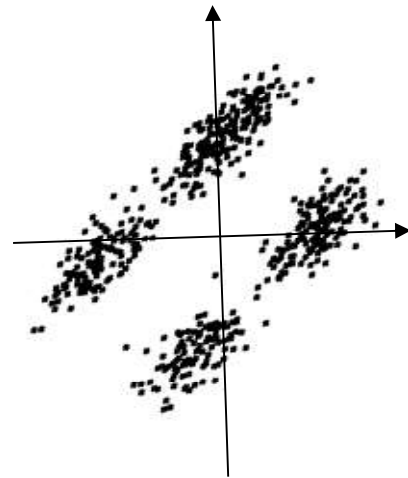
Exemplo

Classes originais

Centros

$$\underline{w}_1 = \begin{bmatrix} 4 \\ 1 \end{bmatrix} \quad \underline{w}_2 = \begin{bmatrix} 1 \\ 4 \end{bmatrix}$$

$$\underline{w}_1 = \begin{bmatrix} -4 \\ -1 \end{bmatrix} \quad \underline{w}_2 = \begin{bmatrix} -1 \\ -4 \end{bmatrix}$$

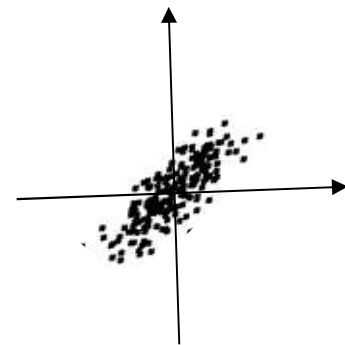


Ruído - elipses de ruído

$$d_1 = 2$$

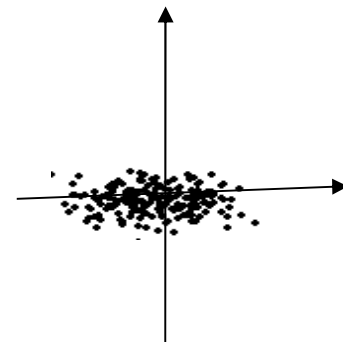
$$d_2 = 4$$

$$\angle x_2, d_2 = 45^\circ$$



Descorrelação

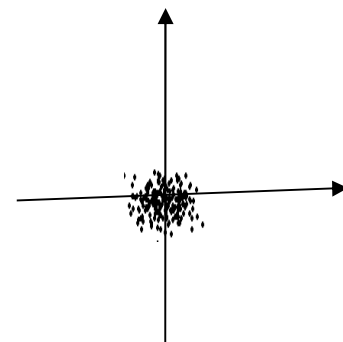
$$\underline{B} = \begin{bmatrix} \cos(-45^\circ) & \sin(-45^\circ) \\ -\sin(-45^\circ) & \cos(-45^\circ) \end{bmatrix} = \frac{\sqrt{2}}{2} \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$$



Escalamento

$$p_{11} = \frac{1}{d_1} = \frac{1}{2}$$

$$p_{22} = \frac{1}{d_2} = \frac{1}{4} \quad \underline{P} = \begin{bmatrix} .5 & 0 \\ 0 & .25 \end{bmatrix}$$



Branqueamento

$$\underline{P}\underline{B} = \begin{bmatrix} .5 & 0 \\ 0 & .25 \end{bmatrix} \frac{\sqrt{2}}{2} \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix} = \frac{\sqrt{2}}{2} \begin{bmatrix} .5 & -.5 \\ .25 & .25 \end{bmatrix}$$

Pré-processamento

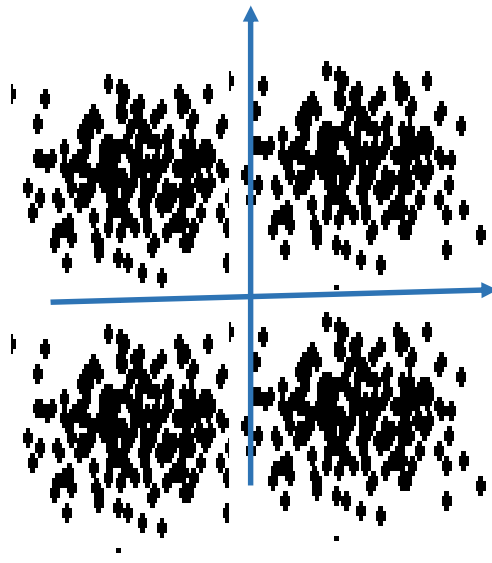
$$\underline{P}\underline{B} = \frac{\sqrt{2}}{8} \begin{bmatrix} 2 & -2 \\ 1 & 1 \end{bmatrix} = .177 \begin{bmatrix} 2 & -2 \\ 1 & 1 \end{bmatrix}$$

Novas classes

$$\underline{W}_i = \underline{P}\underline{B}\underline{w}_i$$

$$\underline{W}_1 = \begin{bmatrix} 1.06 \\ .89 \end{bmatrix} \quad \underline{W}_2 = \begin{bmatrix} -1.06 \\ .89 \end{bmatrix}$$

$$\underline{W}_3 = \begin{bmatrix} -1.06 \\ -.89 \end{bmatrix} \quad \underline{W}_4 = \begin{bmatrix} 1.06 \\ -.89 \end{bmatrix}$$



Neurônios

centros em $\underline{W}_i$

raios (limites) das classes $r = 1$

no limite da classe $e^{-\frac{r^2}{2\sigma^2}} = .5 \quad \sigma = .85$

$$v_i = e^{-\frac{|\underline{x} - \underline{W}_i|^2}{1.45}}$$