TALLLER 4 INTELIGENCIA ARTIFICIAL

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CORPORACION DE ESTUDIOS TECNOLOGICOS DEL NORTE DEL VALLE

TECNOLOGO EN SISTEMAS DE APLICACION

CARTAGO-VALLE

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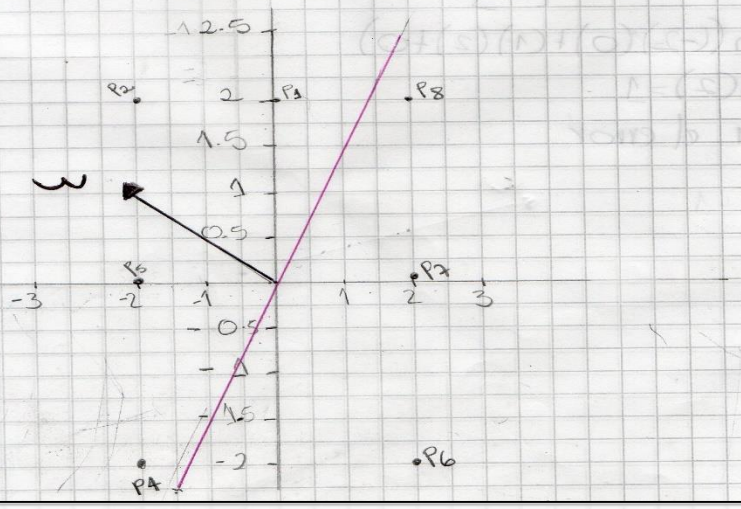
a) Trace la Frontera de decisión

$P_1 = \begin{bmatrix} 0 \\ 2 \end{bmatrix}$ $t_1 = 1$; $P_2 = \begin{bmatrix} -2 \\ 2 \end{bmatrix}$ $t_2 = 1$;

$P_3 = \begin{bmatrix} -2 \\ 2 \end{bmatrix}$ $t_3 = 1$; $P_4 = \begin{bmatrix} -2 \\ -2 \end{bmatrix}$ $t_4 = 1$;

$P_5 = \begin{bmatrix} 0 \\ -2 \end{bmatrix}$ $t_5 = 0$, $P_6 = \begin{bmatrix} 2 \\ -2 \end{bmatrix}$ $t_6 = 0$;

$P_7 = \begin{bmatrix} 2 \\ 0 \end{bmatrix}$ $t_7 = 0$; $P_8 = \begin{bmatrix} 2 \\ 2 \end{bmatrix}$ $t_8 = 1$;



b Encuentre la matriz de Pesos w y el umbral de activación b.

$w = [-2 \ 1]$

$b = 0$

Primer Par

$P_1 = \begin{bmatrix} 0 \\ 2 \end{bmatrix} = t_1 = 1;$

$a = hardlim(wP + b)$

$= hardlim([-2 \ 1]\begin{bmatrix} 0 \\ 2 \end{bmatrix} + 0)$

$= hardlim((-2)(0) + (1)(2) + 0)$

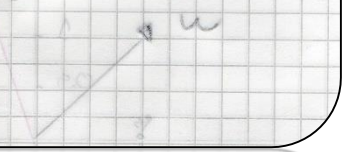
$= hardlim(2) = 1$

Calcula el error

$e = t_1 - a =$

$= 1 - 1$

0



Segundo Par

$P_2 = \begin{bmatrix} -2 \\ 2 \end{bmatrix}$ $t_2 = 1;$

a = hardlim(wP+b)

a = hardlim([-2 1][$\frac{-2}{2}$] + 0)

a = hardlim((-2)(-2) + (1)(2) + 0)

a = hardlim(6) = 1;

Se calcula el error

e = t_2 - a

e = 1 - 1

e = 0

Tercer Par

$P_3 = \begin{bmatrix} -2 \\ 0 \end{bmatrix}$ $t_3 = 1;$

a = hardlim(wP+b)

a = hardlim([-2 1][$\frac{-2}{0}$] + 0

a = hardlim((-2)(-2) + (1)(0) + 0)

a = hardlim(4) = 1

Se calcula el error

e = t_3 - a

e = 1 - 1

Cuarto Par

$P4=\begin{bmatrix}-2\\-2\end{bmatrix}$ $t4=1$,

a=hard lim(wp+b)

a=hardlim($\begin{bmatrix}-2 & 1\end{bmatrix}\begin{bmatrix}-2\\-2\end{bmatrix}+0$)

a=hardlim((-2)(-2)+(1)(-2)+0)

a=hardlim(2)=1

Se calcula el error

e=t4-a

e=1-1

e=0

Octavo Par

$P8=\begin{bmatrix}2\\2\end{bmatrix}$ $t8=1$

a=hardlim(wP+b)

a=hardlim($\begin{bmatrix}-2 & 1\end{bmatrix}\begin{bmatrix}2\\2\end{bmatrix}+0$)

a=hardlim((-2)(2)+(1)(2)+0)

a=hardlim(-2)=1

Se calcula el error

e=t8-a

e=1-1

e=0

Quinto Par

$P5 = \begin{bmatrix} 0 \\ -2 \end{bmatrix}$ $t5 = 0$;

a = hardlim(wP+b)

a = hardlim$\left(\begin{bmatrix} -2 & 1 \end{bmatrix}\begin{bmatrix} 0 \\ -2 \end{bmatrix}+0\right)$

a = hardlim((-2)(0)+(1)(-2)+0)

a = (-2) = 0

e = t5 - a

e = 0 - 0

e = 0

Sexto Par

$P6 = \begin{bmatrix} 2 \\ -2 \end{bmatrix}$ $t6 = 0$;

a = hardlim(wP+b)

a = hardlim$\left(\begin{bmatrix} -2 & 1 \end{bmatrix}\begin{bmatrix} 2 \\ -2 \end{bmatrix}+0\right)$

a = hardlim((-2)(2)+(1)(-2)+0)

a = hardlim(-6) = 0

Se calcula el error

e = t6 - a

e = 0 - 0

e = 0

Septimo Par

$P_7 = \begin{bmatrix} 2 \\ 0 \end{bmatrix}$ $t_7 = 0$;

$a = hardlim(wPtb)$

$a = hardlim([-2\ 1]\begin{bmatrix} 2 \\ 0 \end{bmatrix} + 0)$

$a = hardlim((-2)(2) + (1)(0) + 0)$

$a = hardlim(-4) = 0$

Se calcula el error

$e = t_7 - 0$

$e = 0 - 0$

$e = 0$

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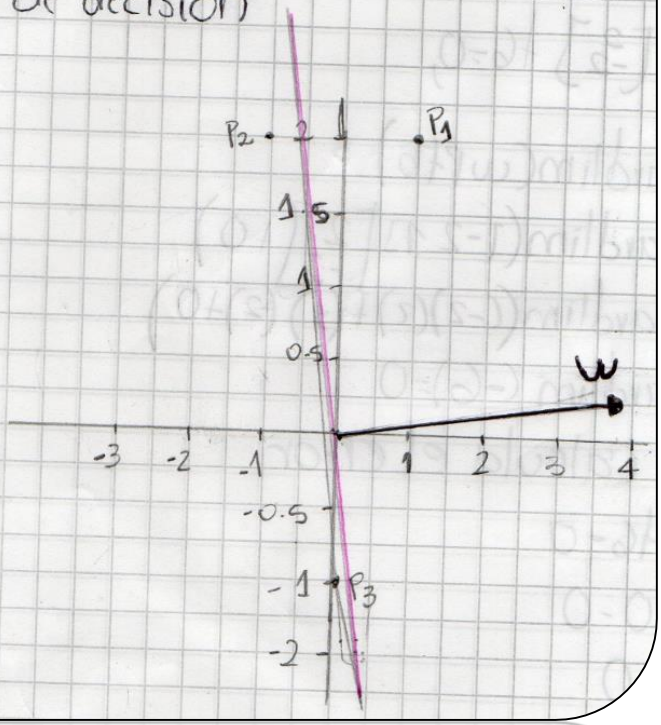
a Trace b Frontera de decisión

$P_1 = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$ $t_1 = 1$;

$P_2 = \begin{bmatrix} -1 \\ 2 \end{bmatrix}$ $t_2 = 0$;

$P_3 = \begin{bmatrix} 0 \\ -1 \end{bmatrix}$ $t_3 = 0$;



b Encuentre la matriz de pesos w y el umbral de activación b.

$w = [1 \ -0,8]$

$b = 0$

Primer Par

$P_1 = \begin{bmatrix} 1 \\ 2 \end{bmatrix} \quad t_1 = 1;$

$a = hardlim(wp + b)$

$a = hardlim\left([1 \ -0.8]\begin{bmatrix} 1 \\ 2 \end{bmatrix} + 0\right)$

$a = hardlim((1)(1) + (-0.8)(2) + 0)$

$a = hardlim(-0,6) = 0$

Se calcular el error

$e = t_1 - a$

$e = 1 - 0$

$e = 1$

C Se modifica el vector de pesos

$w_{nuevo} = w_{anterior} + ep^t$

$w_{nuevo} = [1 \ -0,8] + [1 \ 2]$

$w_{nuevo} = [2 \ 1.2]$

Segundo Par

$P_2 = \begin{bmatrix} -\frac{1}{2} \end{bmatrix}$ $t_2 = 0$;

a1 = hardlim (wP+b)

a1 = hardlim ([2 1.2] $\begin{bmatrix} -\frac{1}{2} \end{bmatrix}$ +0)

a1 = hardlim ((2)(-1)+(1.2)(2)+0)

a1 = hardlim (0.4) = 1

Se calcula el error

e = t2 - a =

e = 0 - 1

e = -1

modifica el vector De Pesos

wnuevo = wanterior + eP'

wnuevo = [2 1.2] + (-1)[-1 2]

wnuevo = [3 -0.8]

Tercer Par

$P_3 = \begin{bmatrix} 0 \\ -1 \end{bmatrix}$ $t_3 = 0$;

a1 = hardlim(wP+b)

a1 = hardlim ([3 -0.8] $\begin{bmatrix} 0 \\ -1 \end{bmatrix}$ +0)

a1 = hardlim ((3)(0)-(0.8)(-1)+0)

a1 = hardlim (0.8) = 1

Calcula el error

= t3 - d = 0

= 0 - 1

= -1

Se modifica el vector

Wnuevo = wanterior + ep^-1

Wnuevo = [3 -0.8] + (-1)[0 -1]

Wnuevo = [3 0.2]

Naranja

$P_1 = \begin{bmatrix} 1 \\ -1 \\ -1 \end{bmatrix}$ $t1 = 0$

Manzana

$P_2 = \begin{bmatrix} 1 \\ 1 \\ -1 \end{bmatrix}$ $t_2 = 1$

Valores iniciales

w = [0.5 -1 -0.5]

b = 0.5

Segundo Manzana

$P_2 = \begin{bmatrix} 1 \\ 1 \\ -1 \end{bmatrix}$ $t_2 = 1$;

$a = hardlim(wP + b)$

$a = hardlim\left([-0.5\ 0\ 0.5]\begin{bmatrix} 1 \\ 1 \\ -1 \end{bmatrix} + (-0.5)\right)$

$a = hardlim((-0.5)(1) + (0)(1) + (0.5) - (1) + 0.5)$

$a = hardlim(-1.5) = 0$

Se calcula el error

$e = t_2 - a$

$e = 1 - 0$

$e = 1$

Vector de Pesos y el umbral

$w_{nuevo} = w_{anterior} + ep^t$

$w_{nuevo} [-0.5\ 0\ 0.5] + [1\ 1\ -1]$

$w_{nuevo} [0.5\ 1\ -0.5]$

$b_{nuevo} = b_{anterior} + e$

$b_{nuevo} = -0.5 + 1$

$b_{nuevo} = 0.5$

Primero Naranja

$P1 = \begin{bmatrix} 1 \\ -1 \\ -1 \end{bmatrix}$ $t1 = 0$;

$a = hardlim(wPtb)$

$a = hardlim([0.5 \ -1 \ -0.5]\begin{bmatrix} 1 \\ -1 \\ -1 \end{bmatrix} + 0.5$

$a = hardlim((0.5)(1) - (1)(-1) - (0.5)(-1) + 0.5)$

$a = hardlim(2.5) = 1$

Se calcula el error

$e = t1 - a =$

$e = 0 - 1$

$e = -1$

Se modifica el vector de pesos y el umbral

$w_{nuevo} = w_{anterior} + ep^t$

$w_{nuevo} = [0.5 \ -1 \ -0.5] + (-1)[1 \ -1 \ -1]$

$w_{nuevo} = [-0.5 \ 0 \ 0.5]$

$b_{nuevo} = b_{anterior} + e$

$b_{nuevo} = 0.5 - 1$

$b_{nuevo} = -0.5$

Segunda

$P_1 \begin{bmatrix} 1 \\ -1 \\ -1 \end{bmatrix} + t_1 = 0$

$a = hardlim(wP + b)$

$a = hardlim([0.5 \ 1 \ 0.5] \begin{bmatrix} 1 \\ -1 \\ -1 \end{bmatrix} + 0.5)$

$a = hardlim((0.5)(1) + (1)(-1) + (0.5)(-1) + 0.5$

$a = hardlim(0.5) = 1$

Se calcula el error

$e = t_1 - a =$

$e = 0 - 1$

$e = -1$

Vector de Pesos y el umbral

$w_{nuevo} = w_{anterior} + ep^t$

$w_{nuevo} = [0.5 \ 1 \ 0.5] + (-1)[1 \ -1 \ -1]$

$w_{nuevo} = [-0.5 \ 2 \ 0.5]$

$b_{nuevo} = b_{anterior} + e$

$b_{nuevo} = 0.5 - 1$

$b_{nuevo} = -0.5$