Função de Ativação

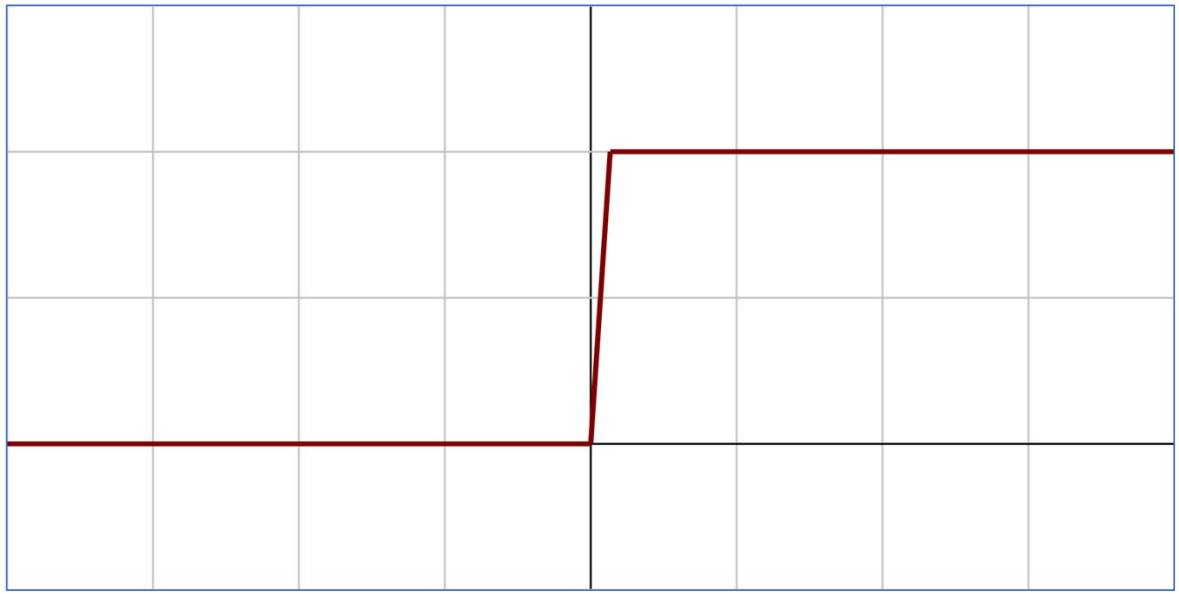
"Define" se o sinal será propagado pela rede

Da a RNA a não linearidade

Principais

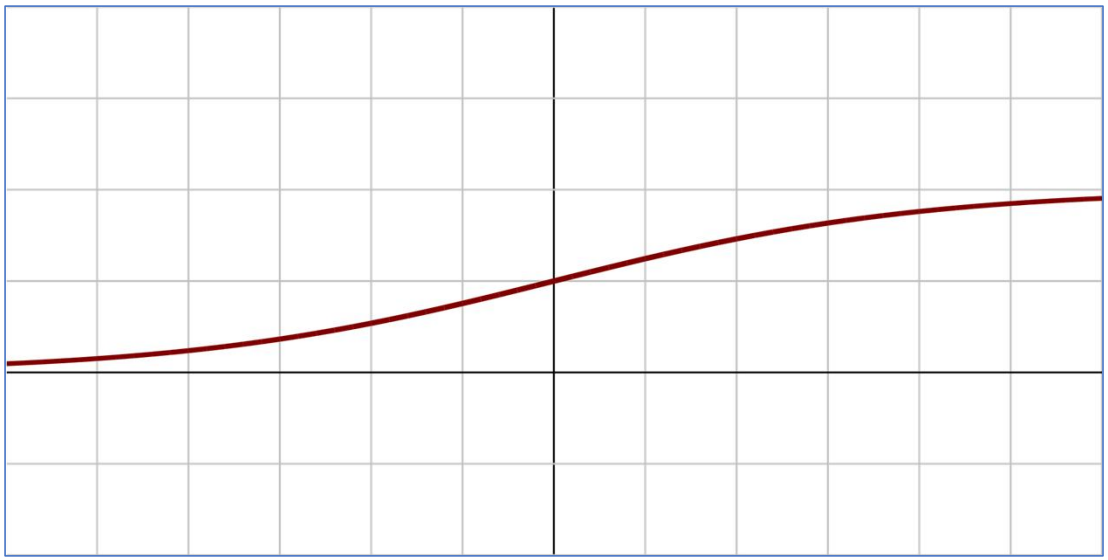
- Threshold
- Sigmoid
- Relu (Rectified Linear Unit)
- Ranh (Hyperbolic tangent activation function)

Threshold (Binary Step)



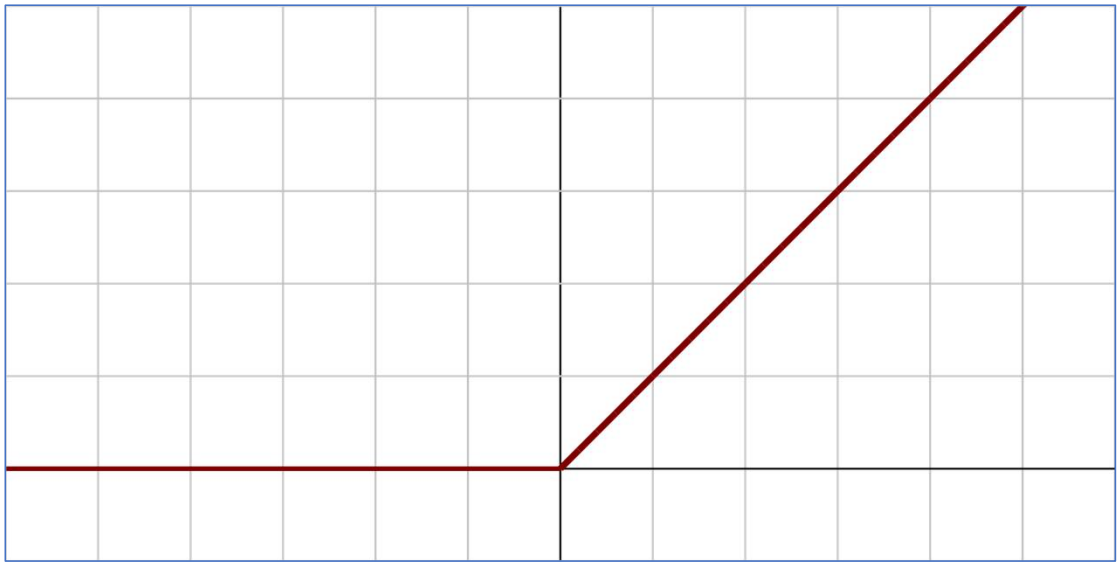
$$f(x) = \begin{cases} 0 & \text{for } x < 0 \\ 1 & \text{for } x \geq 0 \end{cases}$$

Sigmoid



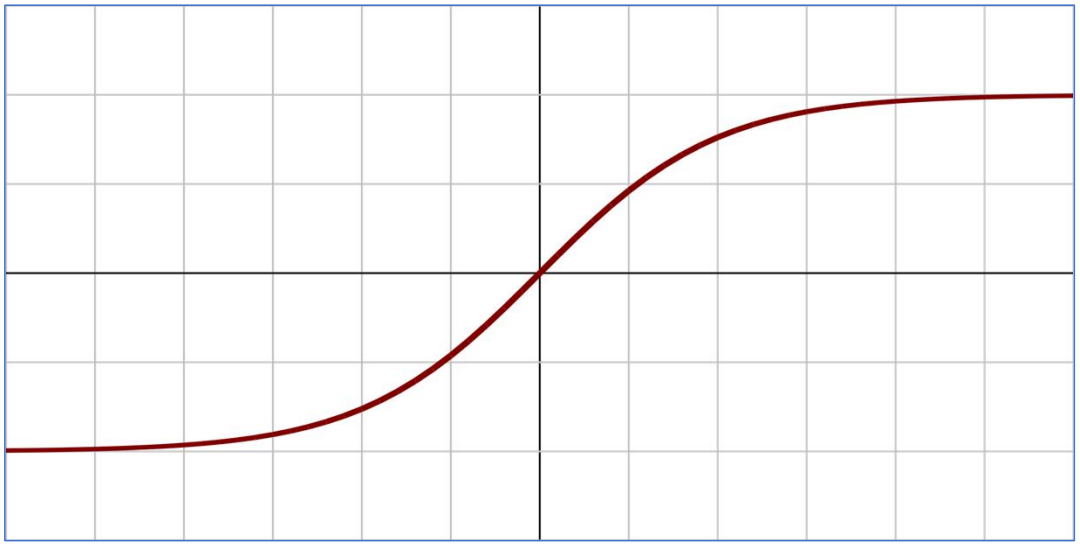
$$f(x) = \sigma(x) = \frac{1}{1 + e^{-x}}$$

Relu (Rectified Linear Unit)



$$f(x) = \begin{cases} 0 & \text{for } x \leq 0 \\ x & \text{for } x > 0 \end{cases}$$

Hyperbolic Tangent (tanh)



$$f(x) = \tanh(x) = \frac{(e^{x} - e^{-x})}{(e^{x} + e^{-x})}$$

Machine Learning

- Loss Function/Cost Function: diferença entre a previsão e o valor real

Root Mean Squared Error (RMSE)

Independente de Escala

- O desvio padrão da amostra da diferença entre o previsto e o teste

Previsto	Realizado	Dif. ao Quad.
3,34	3,00	0,1156
4,18	4,00	0,0324
3,00	3,00	0
2,99	3,00	1E-04
4,51	4,50	1E-04
5,18	4,00	1,3924
8,18	4,50	13,5424

$$RMSE = \sqrt{\frac{\sum_{I=1}^{N}(p_i - t_i)^2}{N}}$$

$$RMSE = \sqrt{\frac{15{,}083}{7}}$$

$$RMSE = 1{,}46$$

Calculada a Loss Function...

- É preciso atualizar os pesos da RNA...
- Backprogation