



deeplearning.ai

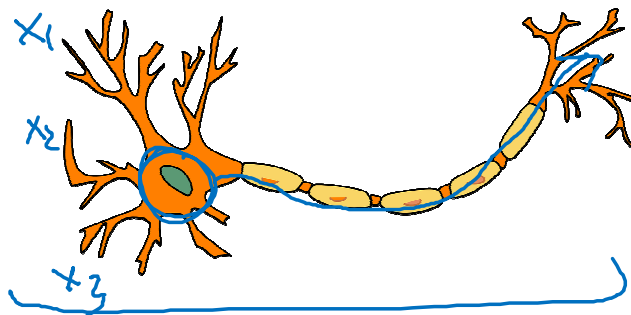
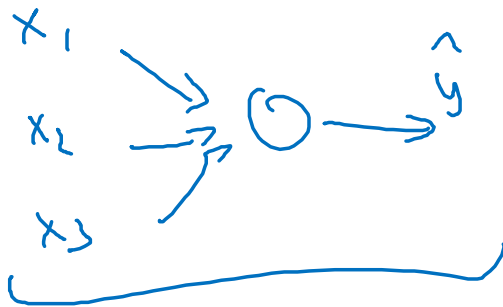
Deep Neural Networks

What does this
have to do with
the brain?

Forward and backward propagation

$$\begin{aligned}Z^{[1]} &= W^{[1]}X + b^{[1]} \\A^{[1]} &= g^{[1]}(Z^{[1]}) \\Z^{[2]} &= W^{[2]}A^{[1]} + b^{[2]} \\A^{[2]} &= g^{[2]}(Z^{[2]}) \\&\vdots \\A^{[L]} &= g^{[L]}(Z^{[L]}) = \hat{Y}\end{aligned}$$

"It's like the brain"



$$\begin{aligned}dZ^{[L]} &= A^{[L]} - Y \\dW^{[L]} &= \frac{1}{m} dZ^{[L]} A^{[L]T} \\db^{[L]} &= \frac{1}{m} \text{np.sum}(dZ^{[L]}, \text{axis} = 1, \text{keepdims} = \text{True}) \\dZ^{[L-1]} &= dW^{[L]T} dZ^{[L]} g'^{[L]}(Z^{[L-1]}) \\&\vdots \\dZ^{[1]} &= dW^{[L]T} dZ^{[2]} g'^{[1]}(Z^{[1]}) \\dW^{[1]} &= \frac{1}{m} dZ^{[1]} A^{[1]T} \\db^{[1]} &= \frac{1}{m} \text{np.sum}(dZ^{[1]}, \text{axis} = 1, \text{keepdims} = \text{True})\end{aligned}$$