



International Center for Tropical Agriculture
Since 1967 Science to cultivate change

Redes neuronales

Julio 2018

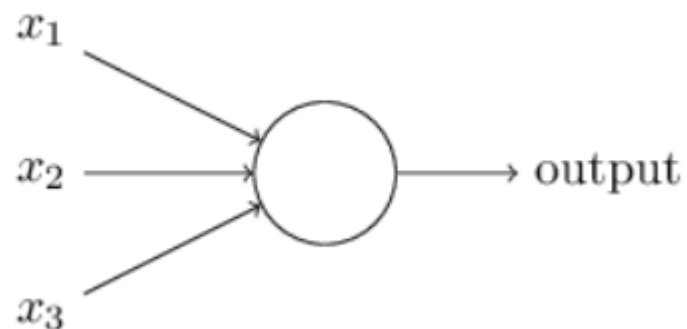
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Perceptrons



$$\text{output} = \begin{cases} 0 & \text{if } \sum_j w_j x_j \leq \text{threshold} \\ 1 & \text{if } \sum_j w_j x_j > \text{threshold} \end{cases}$$

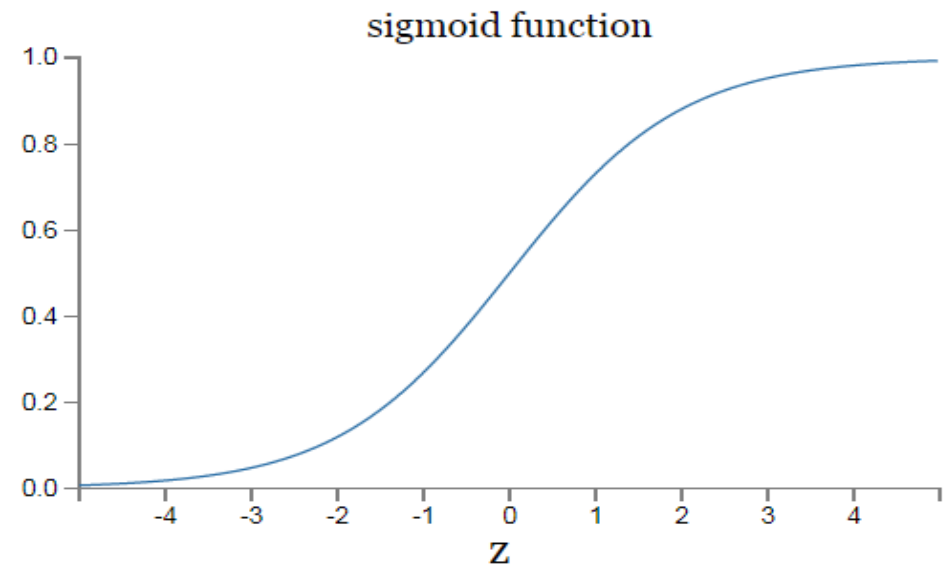
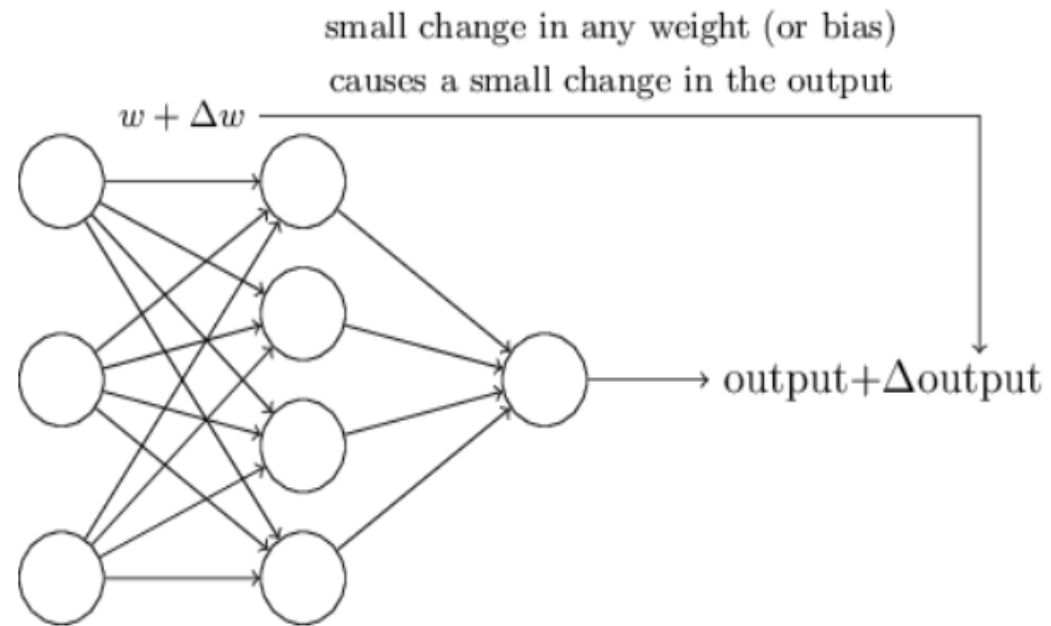
$$\text{output} = \begin{cases} 0 & \text{if } w \cdot x + b \leq 0 \\ 1 & \text{if } w \cdot x + b > 0 \end{cases}$$

threshold of 5 for the perceptron

1. Is the weather good?	$x_1 = 0$	$x_1 = 1$	$w_1 = 6$
2. Does your boyfriend or girlfriend want to accompany you?	$x_2 = 0$	$x_2 = 1$	$w_2 = 2$
3. Is the festival near public transit? (You don't own a car).	$x_3 = 0$	$x_3 = 1$	$w_3 = 2$

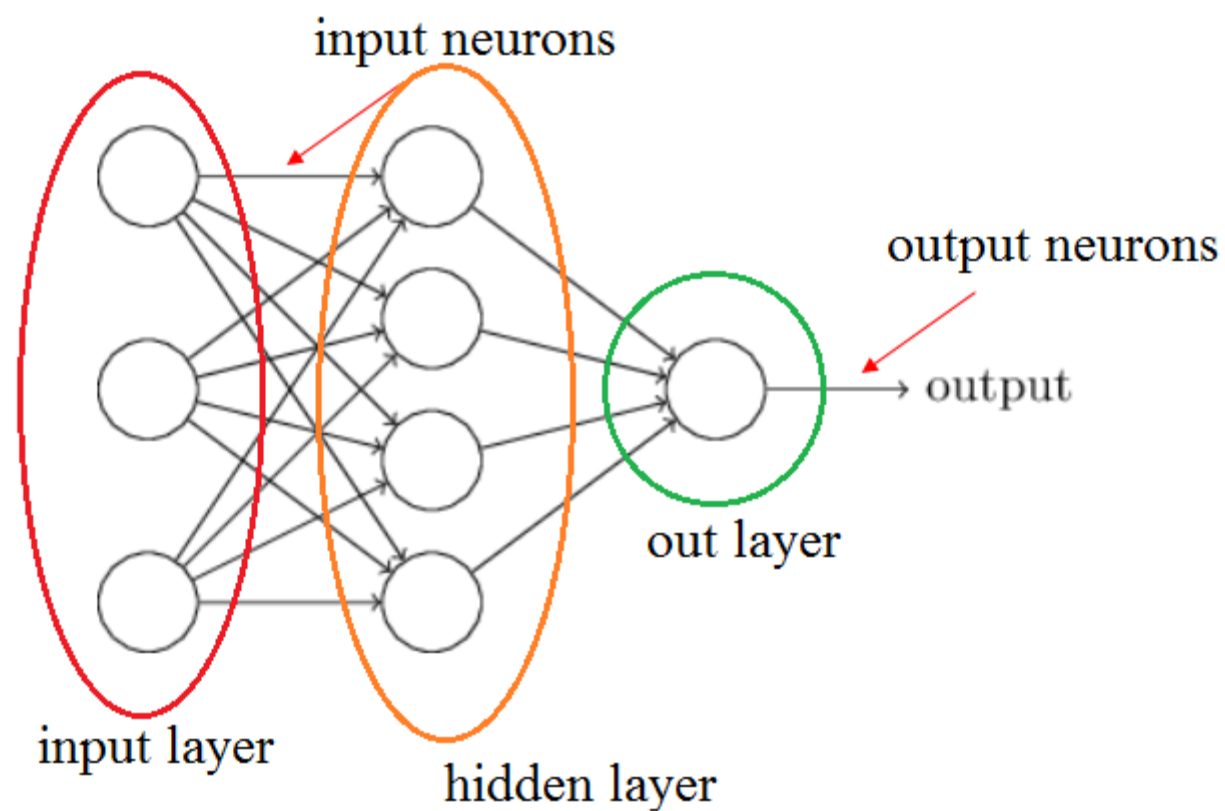
By varying the weights and the threshold, we can get different models of decision-making

Sigmoid neurons



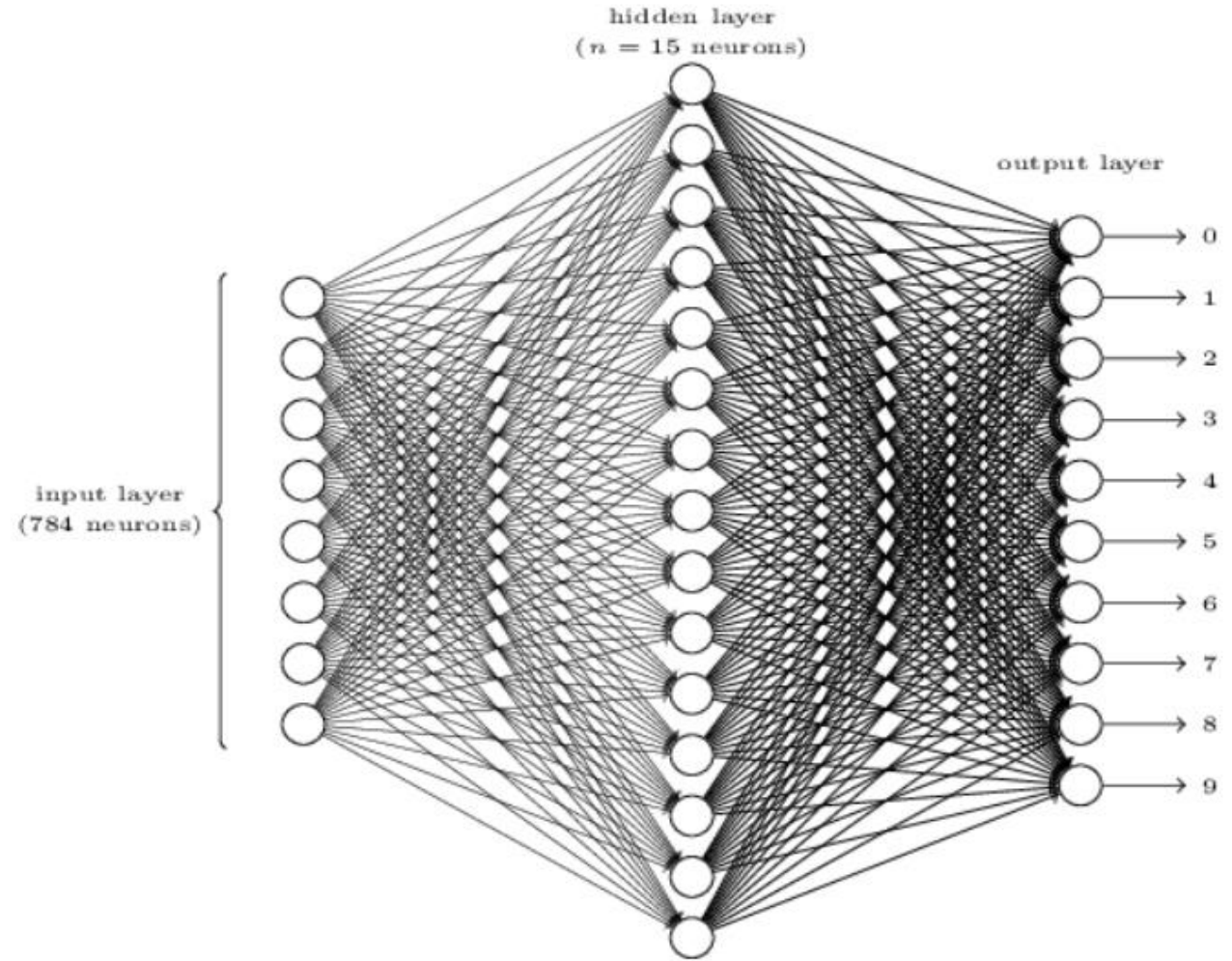
$$\sigma(z) \equiv \frac{1}{1 + e^{-z}}.$$

The architecture of neural networks



A simple network to classify handwritten digits

504192



Thank you!



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HAVE CELEBRATED 50 YEARS
OF AGRICULTURAL RESEARCH
FOR DEVELOPMENT

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