AgroParisTech INRAE

Neural Nets are crazy cool

Some fancy subtitle
in 2 lines maybe

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Supervised by **Prof.1** and **Prof.2**

MIA
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29/07/2025

Outline

An artificial neuron !

Other aspects of the template

An artificial neuron !

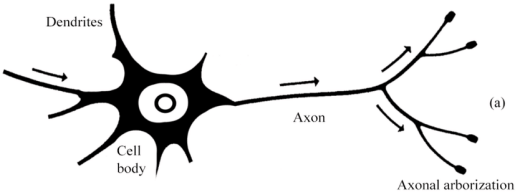
The McCulloch-Pitts Model

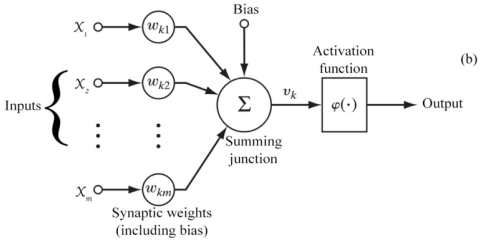
- This is the first point
  - This is a second hierarchy point
- Here's the second point
- And a third point

The equation of a Neural Network

The equation gouverning neuron k is :

$$\text{Output}_k = \varphi(\sum_{1}^{m} x_i w_{ki} + \text{Bias})$$





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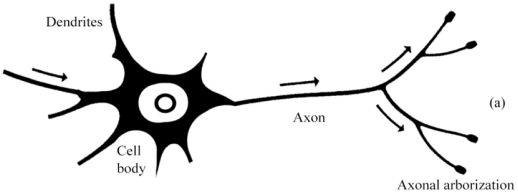

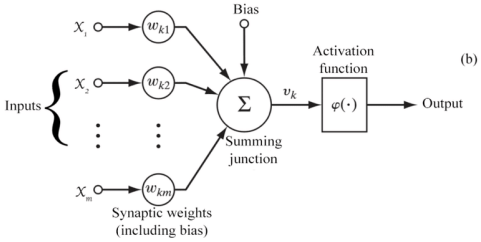

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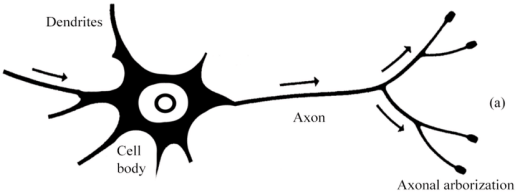

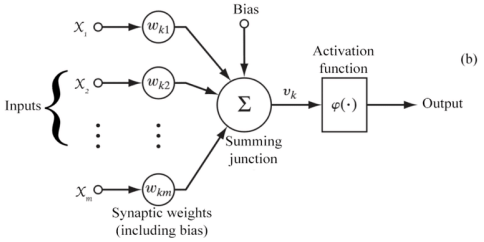

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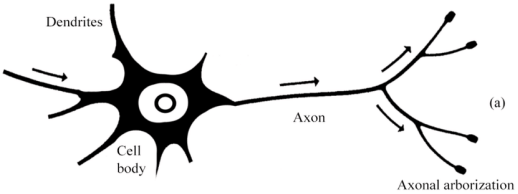

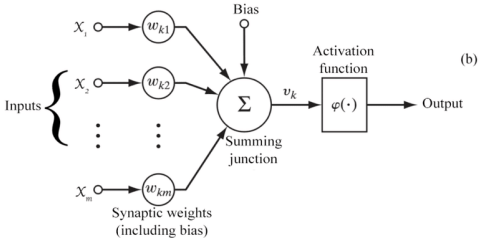

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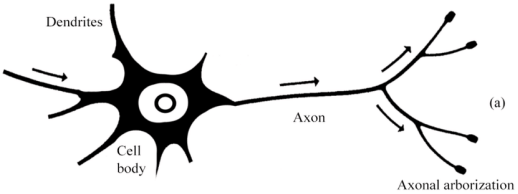

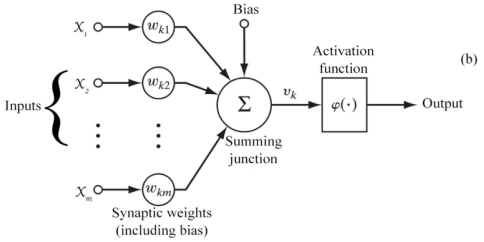

Algorithm 1 Hyper simple Backprop

For a sample (x_n, y_n^*), propagate the input x_n through the network to compute the outputs $(v_{i_1}, \dots, v_{i_{|V|}})$ (in topological order).

Compute the loss $\mathcal{L}_n := \mathcal{L}(v_{i_{|V|}}, y_n^*)$ and its gradient.

$$\frac{\partial \mathcal{L}_n}{\partial v_{i_{|V|}}}. \tag{1}$$

for $j \in |V|, \dots, 1$ **do**

$$\frac{\partial \mathcal{L}_n}{\partial w_j} = \frac{\partial \mathcal{L}_n}{\partial v_{i_{|V|}}} \prod_{k=j+1}^{|V|} \frac{\partial v_{i_k}}{\partial v_{i_{k-1}}} \frac{\partial v_{i_j}}{\partial w_j}. \tag{2}$$

where w_j refers to the weights in node i_j.
end for

Other aspects of the template

Blocks!

This is a Block

This is the primary colour

Blocks!

This is a Block

This is the primary colour

This is an Example Block

This is derived from the primary colour

Blocks!

This is a Block

This is the primary colour

This is an Example Block

This is derived from the primary colour

This is an Alert Block

This is also derived from the primary colour