1819-108-C3-W10

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- The sigmoid function (or logistic)

$$\phi(x) = \frac{1}{1 + \exp(-x)}.$$

- The hyperbolic tangent function ("tanh")

$$\phi(x) = \frac{\exp(x) - \exp(-x)}{\exp(x) + \exp(-x)} = \frac{\exp(2x) - 1}{\exp(2x) + 1}.$$

- The hard threshold function

$$\phi_\beta(x) = \mathbf{1}_{x \geq \beta}.$$

- The Rectified Linear Unit (ReLU) activation function

$$\phi(x) = \max(0, x).$$

Here is a schematic representation of an artificial neuron where $\Sigma = \langle w_j, x \rangle + b_j$.

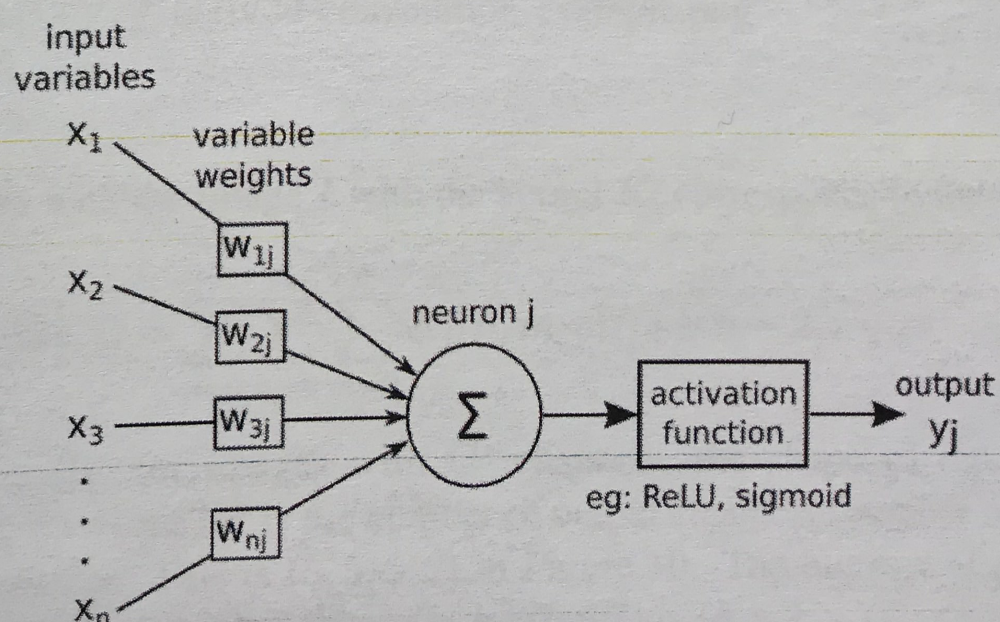

Figure 1: source: andrewjames turner.co.uk

The Figure 2 represents the activation function described above.

- The sigmoid function (or logistic)

$$\phi(x) = \frac{1}{1 + exp(-x)}.$$

- The hyperbolic tangent function ("tanh")

$$\phi(x) = \frac{epx(x) - exp(-x)}{exp(x) + exp(-x)} = \frac{exp(2x) - 1}{exp(2x) + 1}.$$

- The hard threshold function

$$\phi(x) = 1_{x \geq \beta}$$

- The Rectified Linear Unit (ReLU) activation function

$$\phi(x) = max(0, x).$$

Here is a schematic representation of an artificial neuron where $\sum = \langle w_j, x \rangle + b_j$

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\begin{itemize}
    \item The sigmoid function (or logistic)
        $$\phi(x)=\frac{1}{1+exp(-x)}.$$
    \item The hyperbolic tangent function ("tanh")
        $$\phi(x)=\frac{epx(x)-exp(-x)}{exp(x)+exp(-x)}=\frac{exp(2x)-1}{exp(2x)+1}.$$
    \item The hard threshold function
        $$\phi(x)=1_{x\geq\beta}$$
    \item The Rectified Linear Unit (ReLU) activation function
        $$\phi(x)=max(0,x).$$
\end{itemize}
Here is a schematic representation of an artificial neuron where $\sum=\langle w_j,x\rangle-
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