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April 2019

- 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

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

The Rectified Linear Unit (ReLU) activation function

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

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

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    \begin{document}
\maketitle
\pagebreak
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    {exp(x)+exp(-x)}= \frac{exp(2x)-1}
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- 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 $\Sigma = \langle w_j, x \rangle + b_j$.

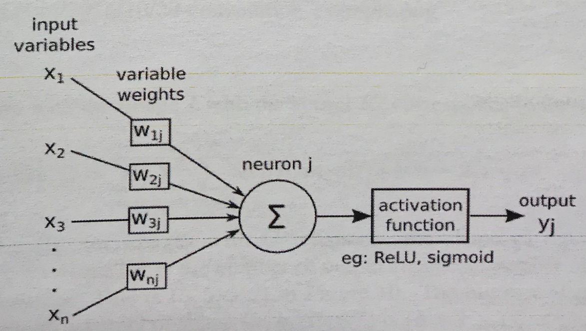

Figure 1: source: andrewjames turner.co.uk

The Figure 2 represents the activation function described above.