week 10

Sindija Vītola

April 2019

- The sigmoind 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

$$\phi_\beta = 1_{x \geq \beta}$$

- The Rectified Linear Unit (ReLU) activation function

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

Here is a schematic represantation of an artificial neuron when $\Sigma = \langle w_j, x \rangle + b_j$

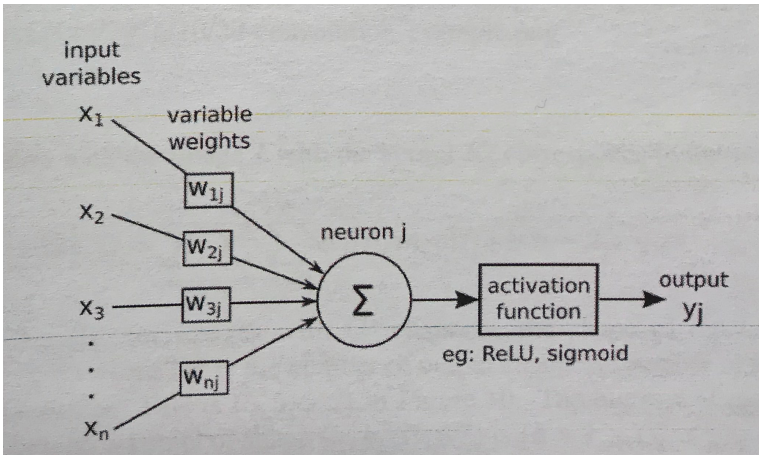

Figure 1: Figure 1: source: andrewjames turner.co.uk

The Figure 2 represents the activation function described above.

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- The hard threshold function

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

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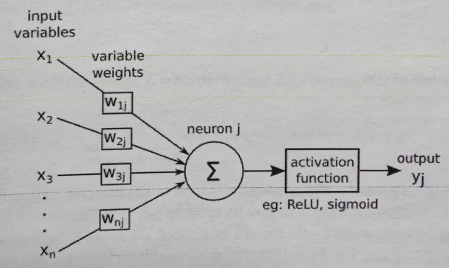

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The Figure 2 represents the activation function described above.

```
    \documentclass{report}
\usepackage[utf8]{inputenc}
\usepackage{amsmath}
\usepackage{graphicx}

\title{week 10}
\author{Sindija Vītola}
\date{April 2019}

\begin{document}

\maketitle


\begin{itemize}
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    \item The sigmoind function (or logistic)
    $$\phi (x) = \frac{1}{1+exp(-x)}.$$

    \item The hyperbolic tangent function ("tanh")
    $$\phi (x) = \frac{exp(x)-exp(-x)}{exp(x)+exp(-x)} = \frac{exp(2x)-1}{exp(2x)+1}.$$

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    $$\phi_{\beta} = 1_{x\geq \beta}$$

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

\end{itemize}

\noindent Here is a schematic represantation of an artificial neuron when $\Sigma =

\langle w_{j},x\rangle + b_{j}$


\begin{figure}
    \centering
    \includegraphics[width=10cm]{IMG_1205-1.jpg}
    \caption{Figure 1: source: andrewjames turner.co.uk}
\end{figure}

\noindent The Figure 2 represents the activation function described above.
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