Course 1 - Introduction

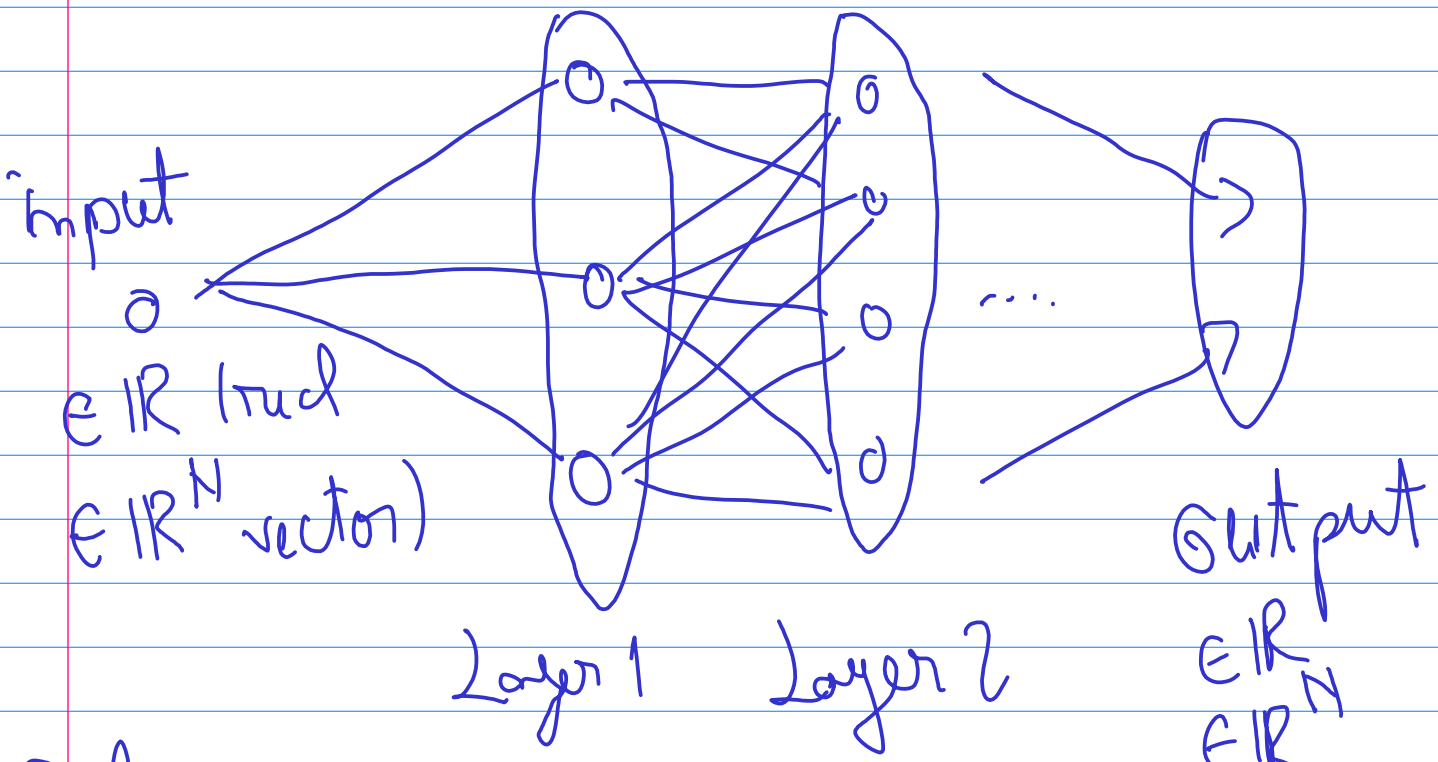
Materials: website

benjamin-bogosel.github.io

DEEP LEARNING:

Use Neural Networks to "learn things"

NEURAL NETWORK (function)



Goal: For certain inputs we should obtain the expected outputs.

"Intelligent behavior".

Examples: 1) Automatic classification.

2) Image classification.

3) Computer Vision.

The learning part in deep learning: computer must find the "rules" that produce the expected outputs. mimicking the data.

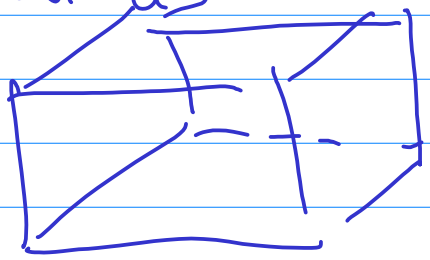
A neural network is a (fancy) function with tunable parameters.

Neural networks are Universal approximators.

We can have errors.

Learning = tuning parameters.

Tensor: array of numbers.

- scaler
- vectors
- matrices
-  3D-matrix.

$$\begin{bmatrix} v_1 \\ \\ v_n \end{bmatrix}, \quad \begin{bmatrix} [1,0] \\ [0,1] \end{bmatrix}, \quad \begin{bmatrix} \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix} \\ \begin{bmatrix} 0.5 & 6 \\ 0.4 & 1 \end{bmatrix} \\ \vdots \end{bmatrix}$$

$$\begin{pmatrix} 1 & 2 & 3 \end{pmatrix} \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix} = 14$$

Transpose

$$A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix} \rightarrow A^T = \begin{pmatrix} 1 & 3 & 5 \\ 2 & 4 & 6 \end{pmatrix}$$