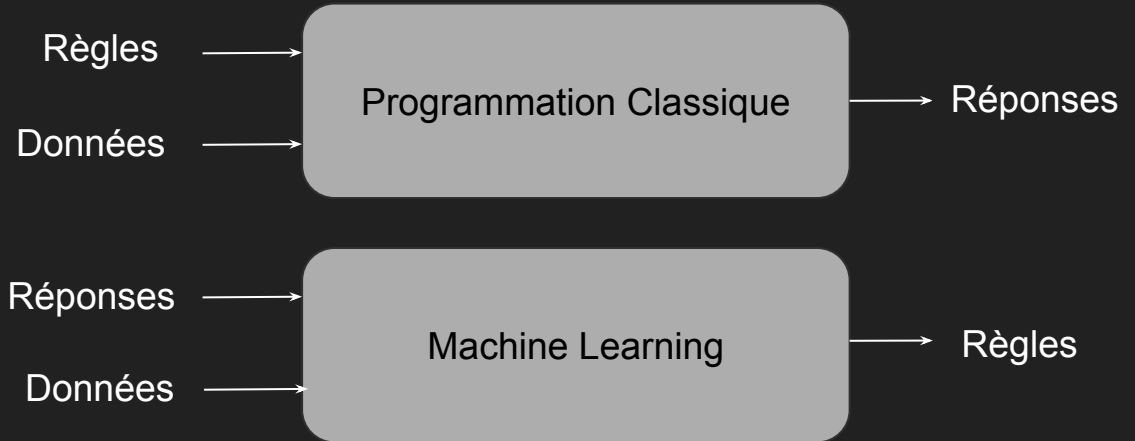
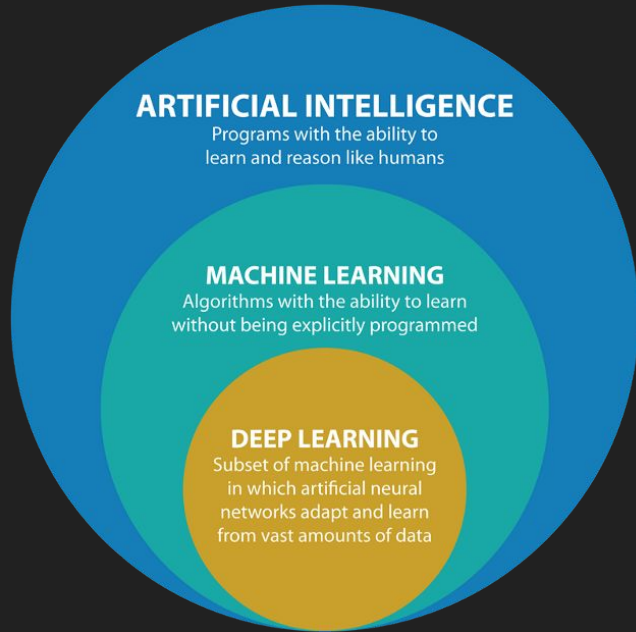


# INTRODUCTION AU DEEP LEARNING



Réseaux de neurones

# Vue d'ensemble - Machine Learning



# Vue d'ensemble - Réseau de neurones



**ENTRÉE**

NEURAL  
NETWORK

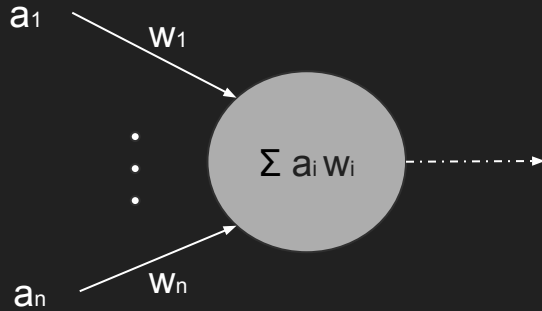


0 : background  
1 : chat  
2 : chien

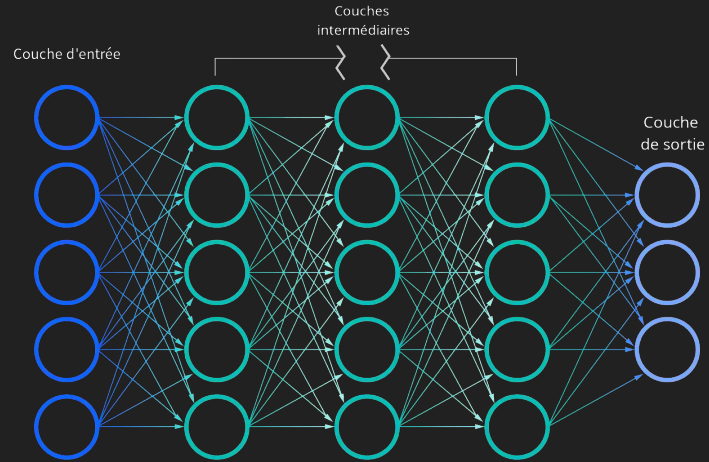
0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	1	1	1	1	0	0	0	0	0
0	0	0	0	0	0	1	1	1	1	0	0	0	0	0
0	1	0	0	0	1	1	1	1	1	0	0	0	0	0
0	1	1	1	1	1	1	1	1	2	2	2	2	2	0
0	1	1	1	1	1	1	2	2	2	2	2	2	2	0
0	1	1	1	1	1	1	2	2	2	2	2	2	0	0
0	1	1	1	1	1	1	2	2	2	2	2	0	0	0
0	0	0	1	1	1	0	1	2	2	2	0	0	0	0
0	0	1	1	0	0	0	0	0	2	2	0	0	0	0

**SORTIE**

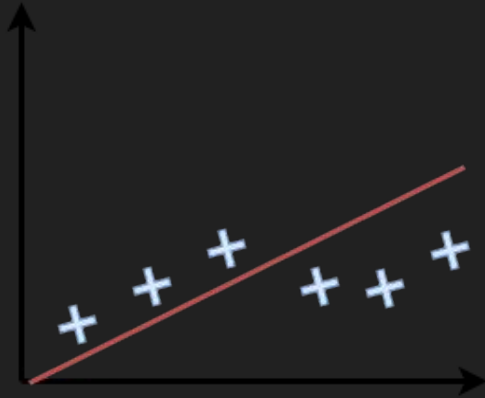
# Neurone - Fonctionnement et Interconnexion



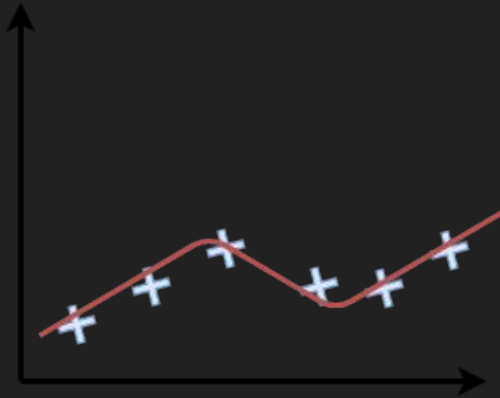
Neurone quelconque



# Neurone - Biais et Fonction d'activation



Linear Function



Non-Linear Function

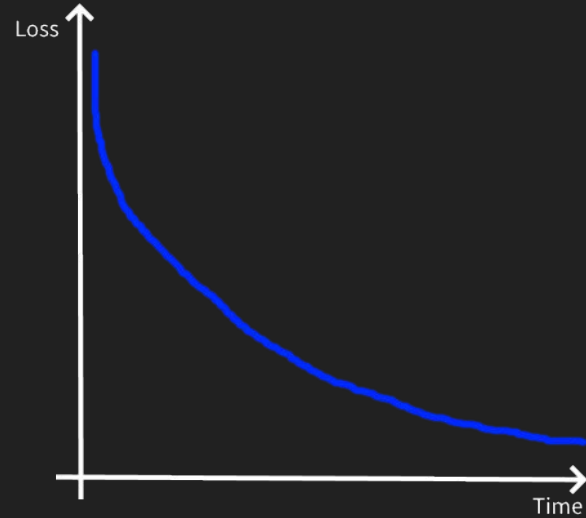
$$\text{Sigmoid} = \frac{1}{1 + e^{-x}}$$
$$\text{ReLU} = \max(0, x)$$

# Entraînement - La fonction de coût

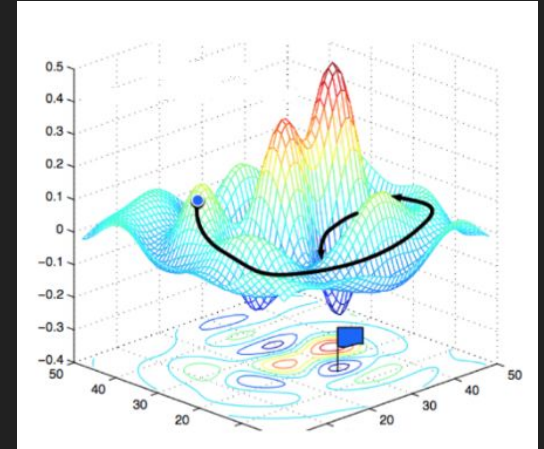
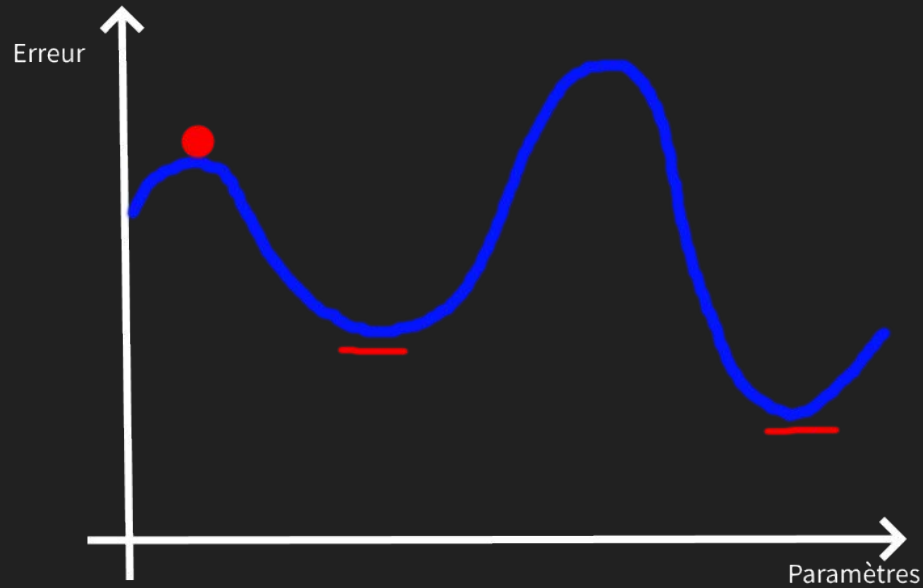
$$\text{MSE} = \frac{1}{n} \sum_{i=1}^n (Y_i - \hat{Y}_i)^2$$

Mean Error Squared

$s = T$



# Entraînement - Backpropagation et descente de gradient



Place à la pratique !