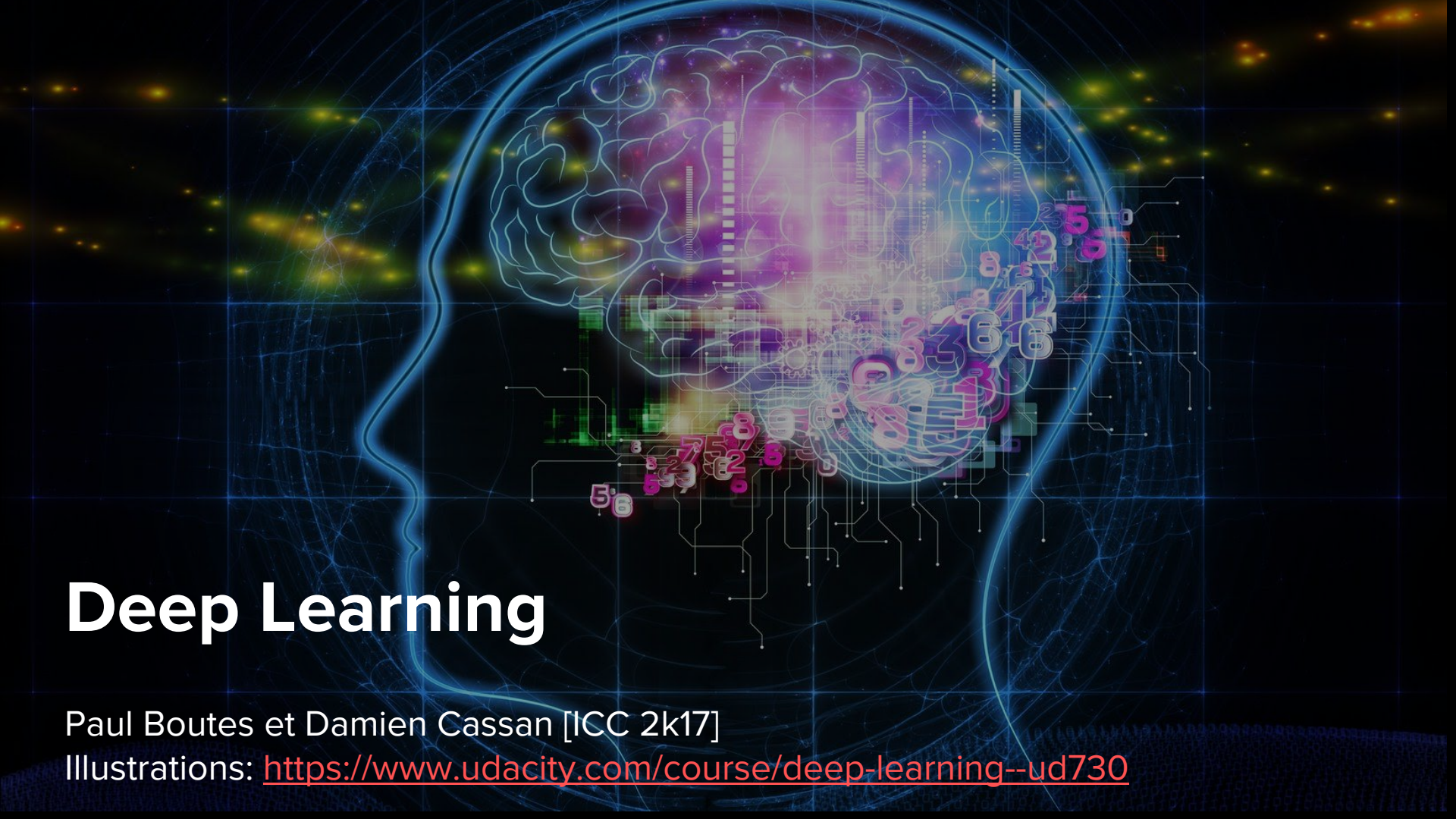


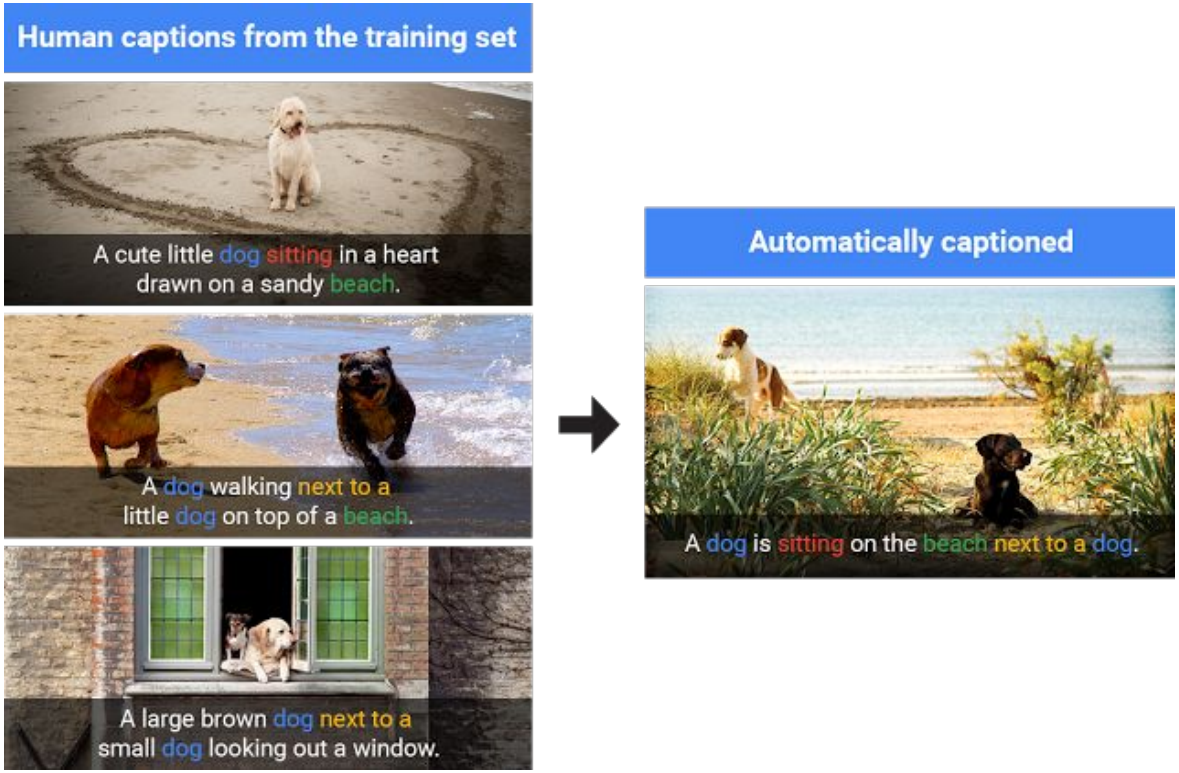
Deep Learning

Paul Boutes et Damien Cassan [ICC 2k17]

Illustrations: https://www.udacity.com/course/deep-learning--ud730

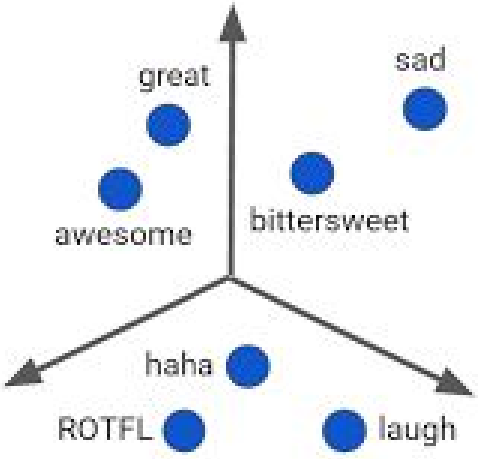
ÉTAT DE L’ART

Description d’image

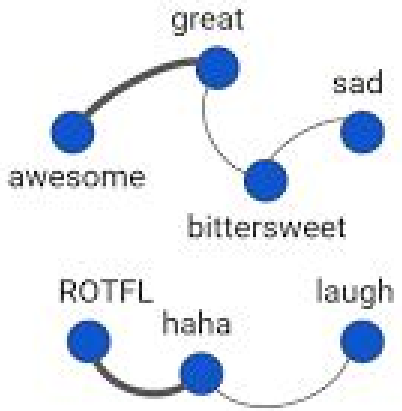


Transfert de style

Parcours de graphe

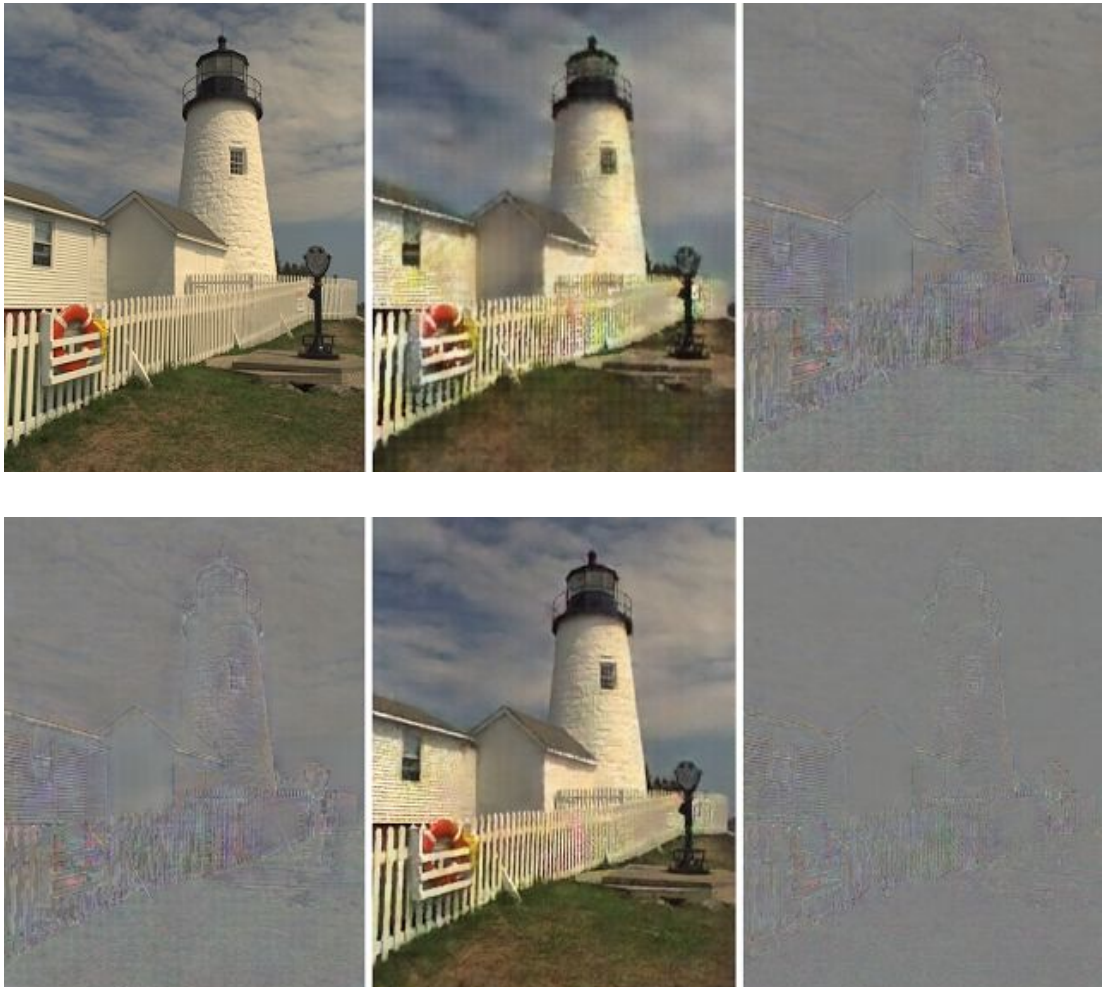


Word Embedding Vectors (dense, continuous space)

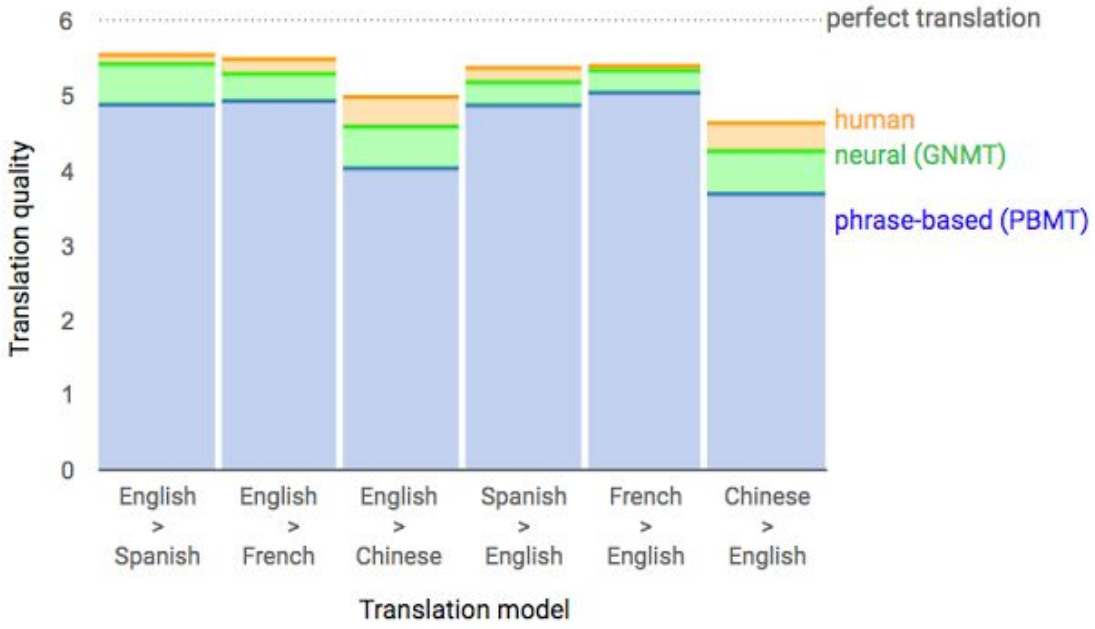


Word Similarity Graph

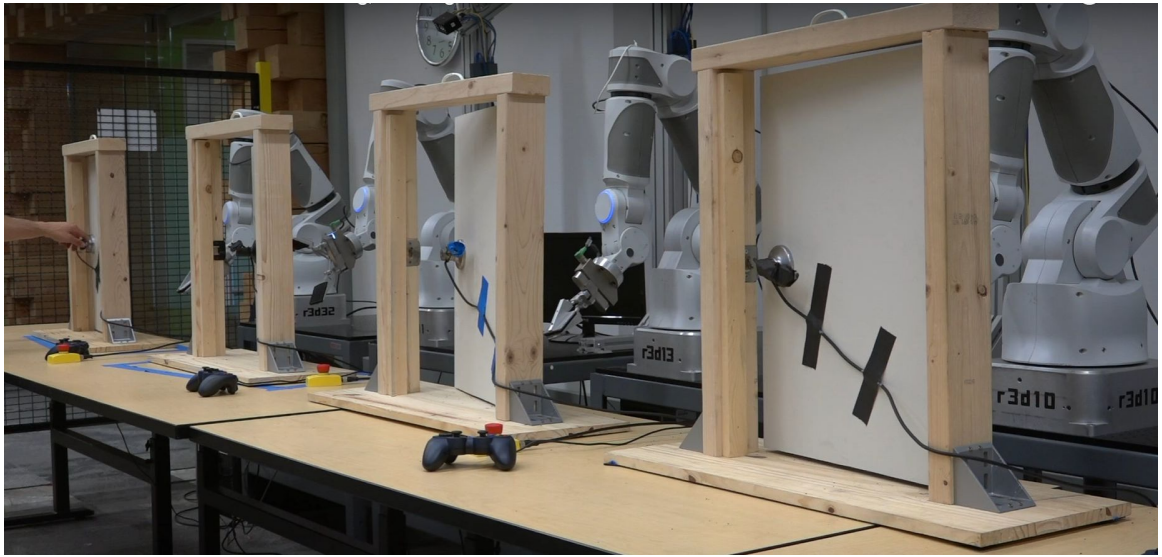
Compression d’image



Traduction

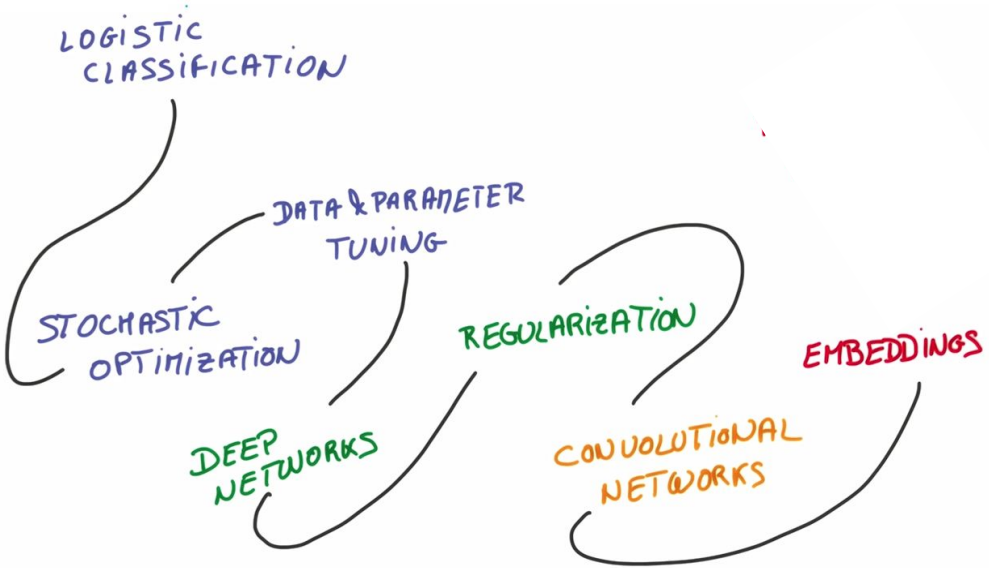

perfect translation
human
neural (GNMT)
phrase-based (PBMT)
Translation quality
6
5
4
3
2
1
0
English > Spanish
English > French
English > Chinese
Spanish > English
French > English
Chinese > English
Translation model

Apprentissage collectif

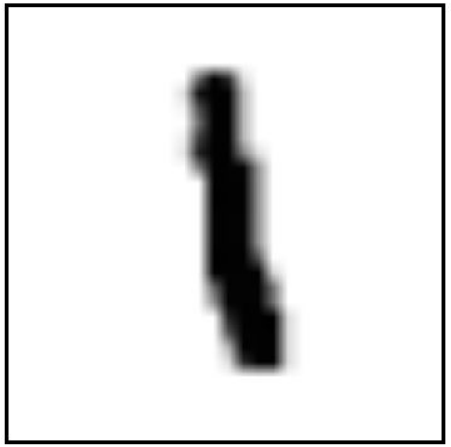


LE DEEP LEARNING

Evolution des réseaux de neurones



La classification MNIST

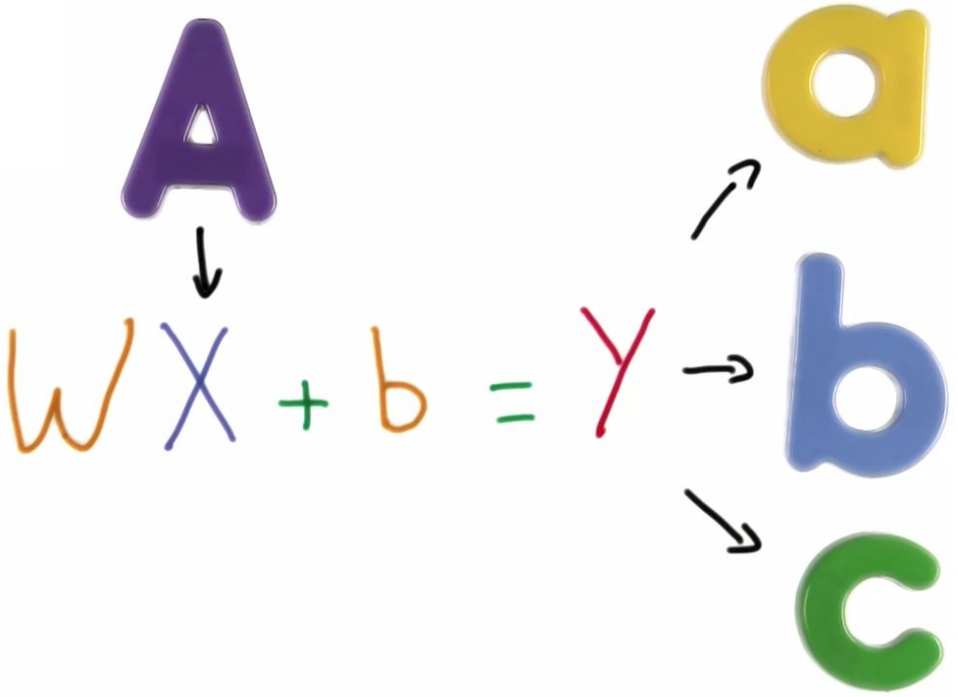


≅

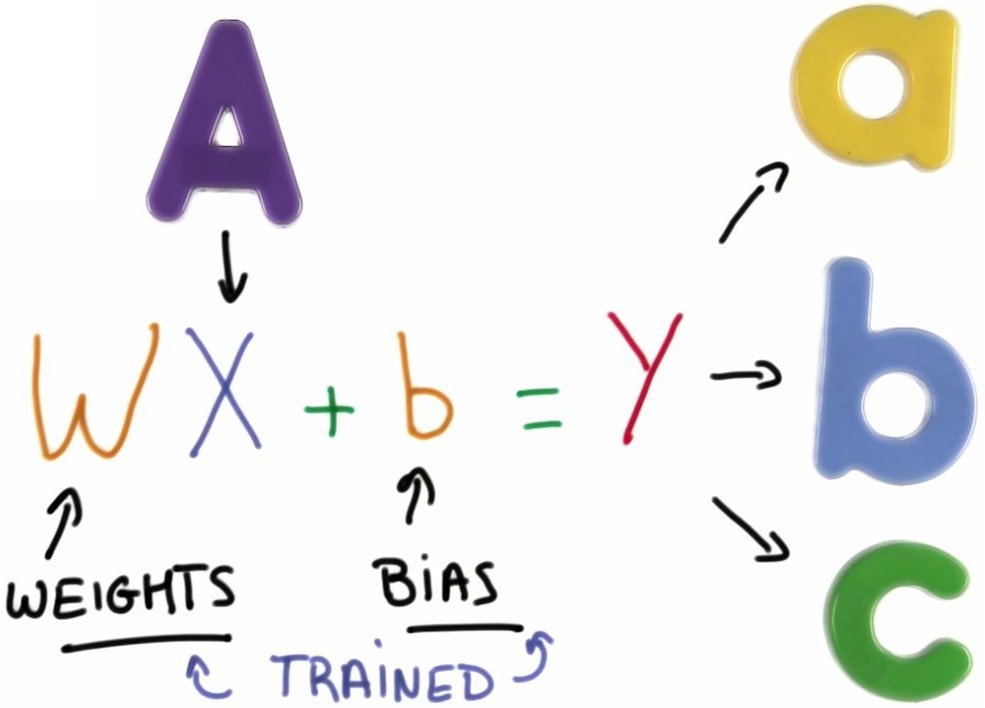
$$
\begin{bmatrix}
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & .6 & .8 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & .7 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & .7 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & .5 & 1 & .4 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & .4 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & .4 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & .7 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & .9 & 1 & .1 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & .3 & 1 & .1 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0
\end{bmatrix}
$$

LA REGRESSION LOGISTIQUE

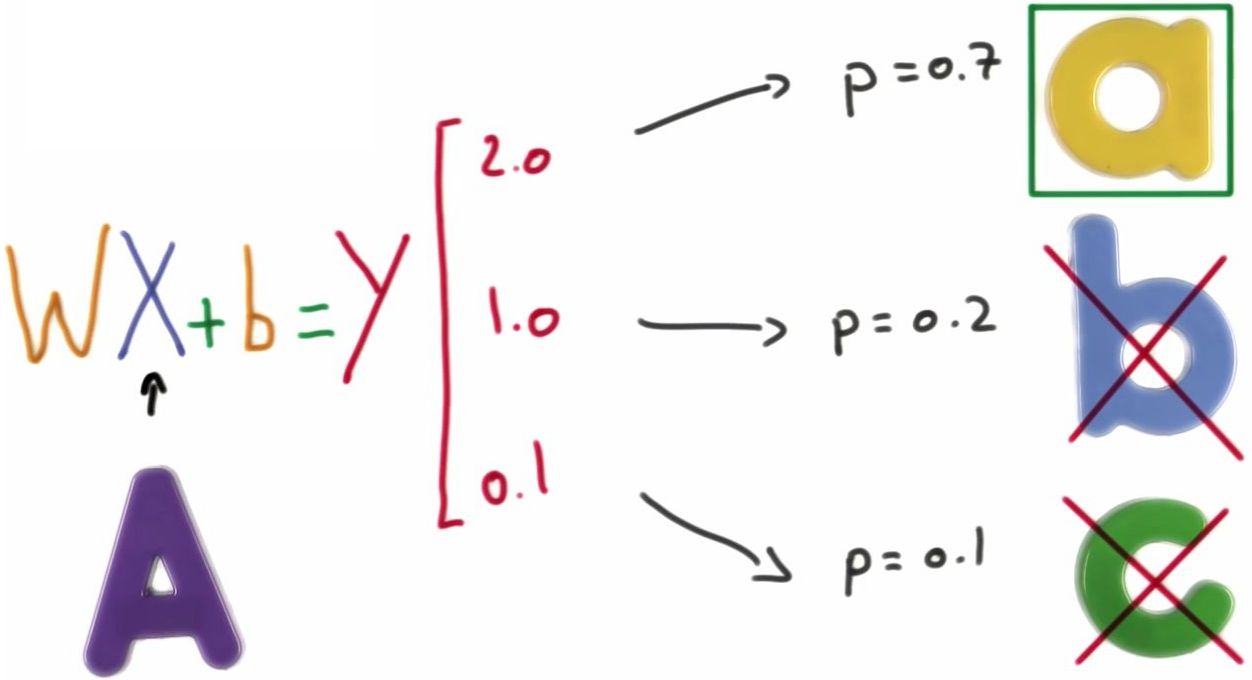
Regression logistique



Regression logistique

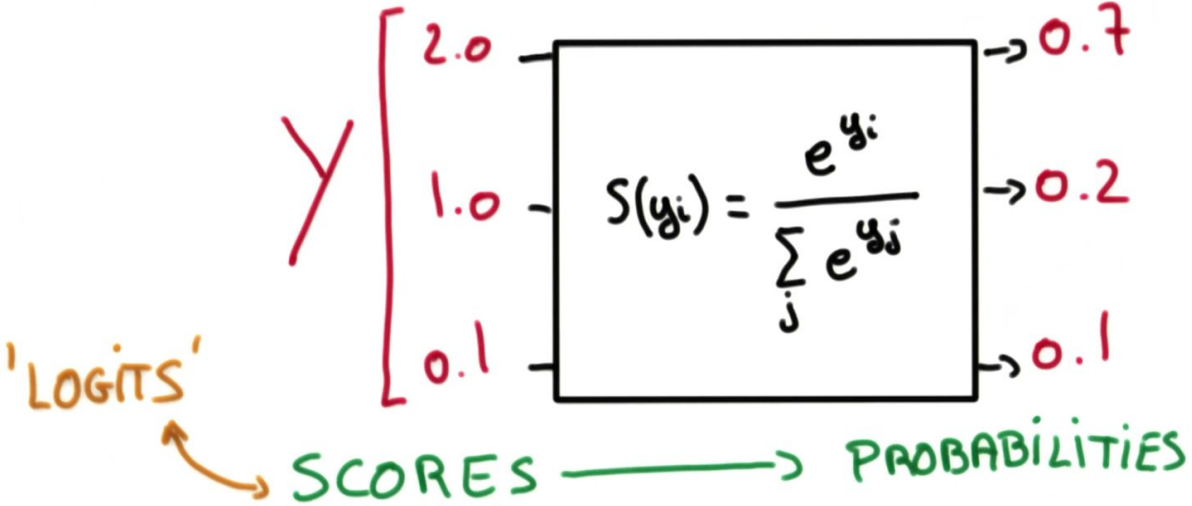


Regression logistique



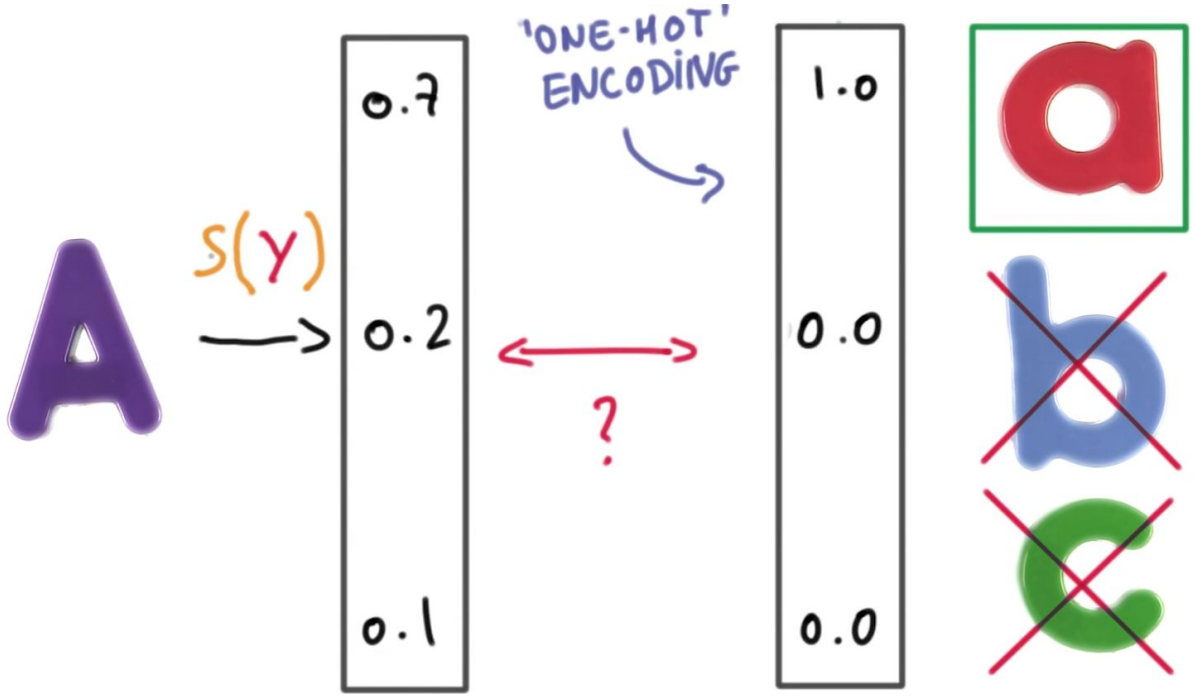
Regression logistique

La fonction *SOFTMAX*



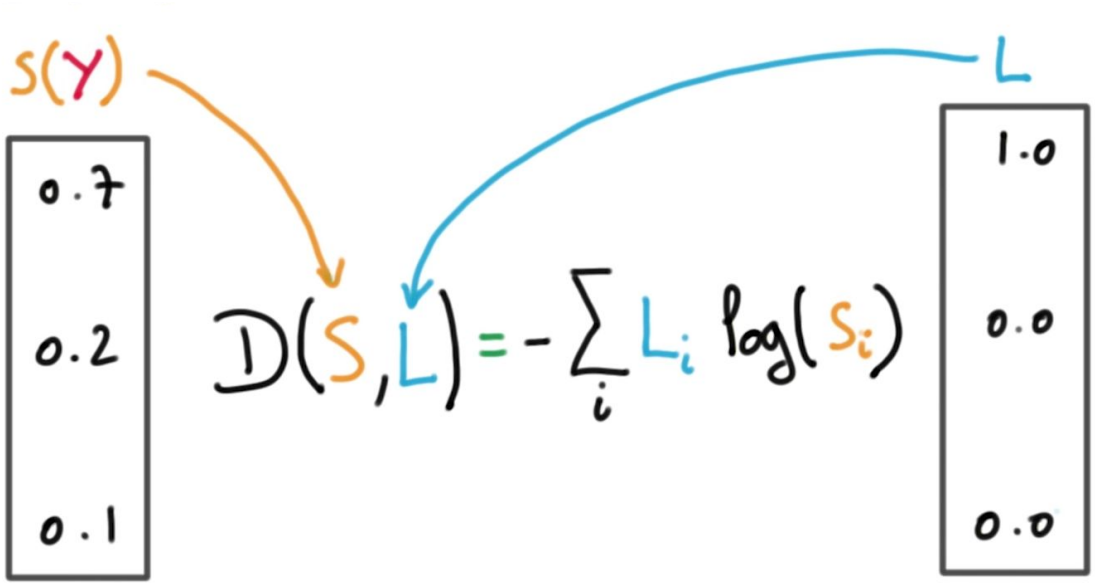
Regression logistique

Encodage One-Hot



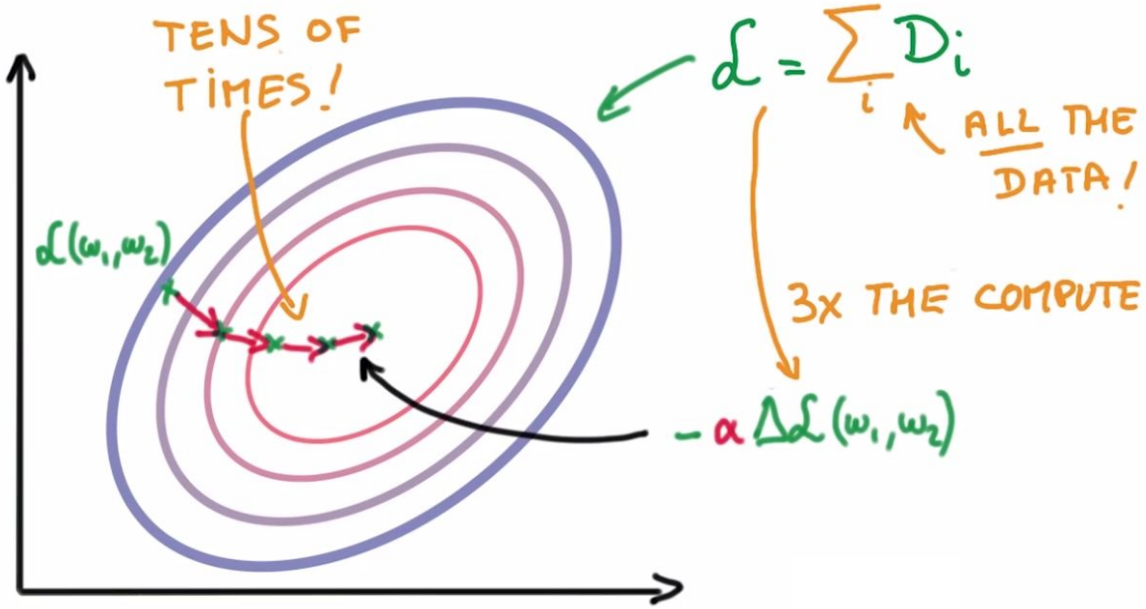
Regression logistique

Entropie croisée



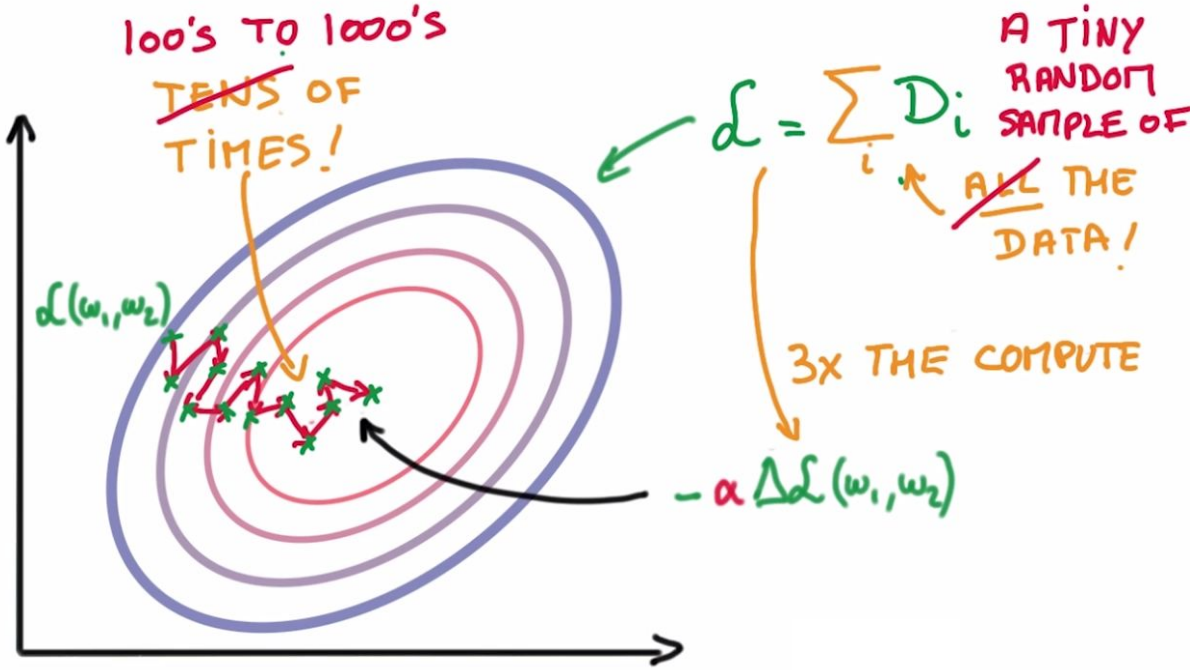
Regression logistique

Descente de gradient



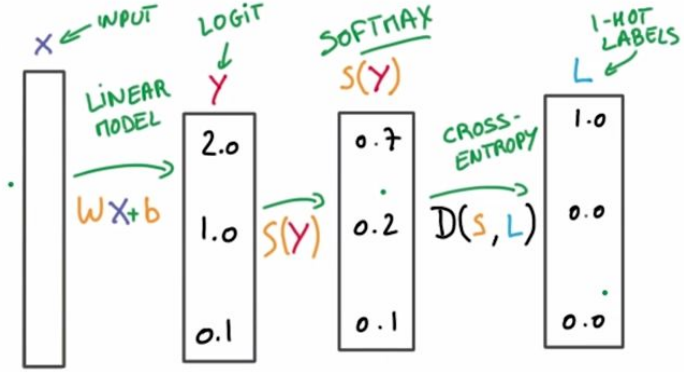
Regression logistique

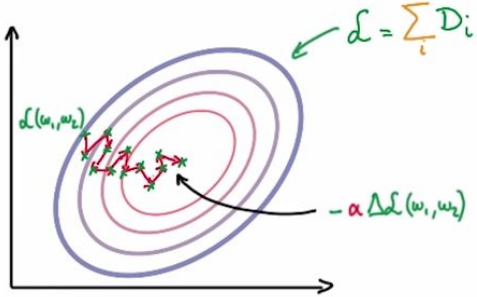
Descente de gradient stochastique



Regression logistique

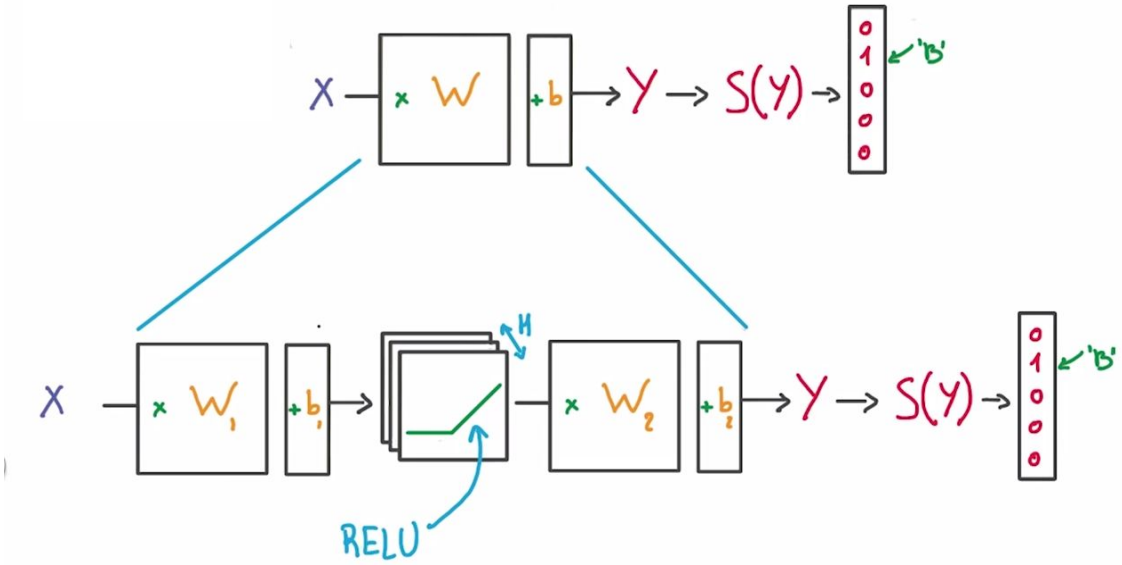
Descente de gradient stochastique





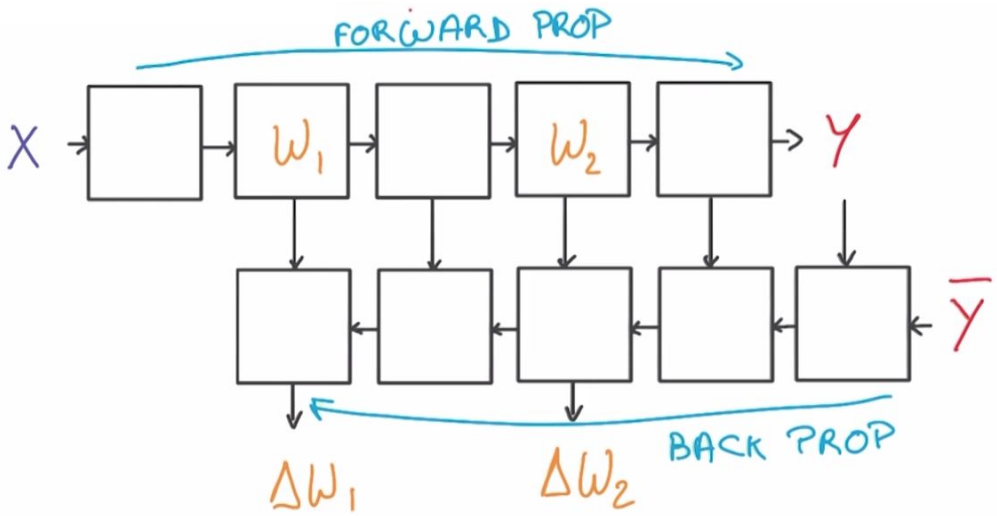
Les réseaux de neurones

Réseaux de neurones



Réseaux de neurones

La Rétropropagation du gradient



Les techniques d’améliorations

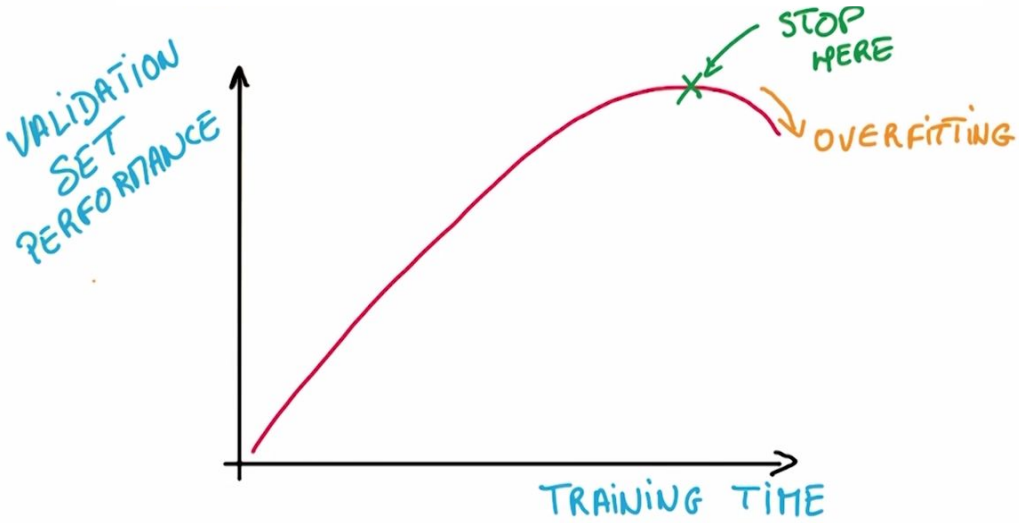
Démonstration

Typescript Classification

Tensorflow Playground

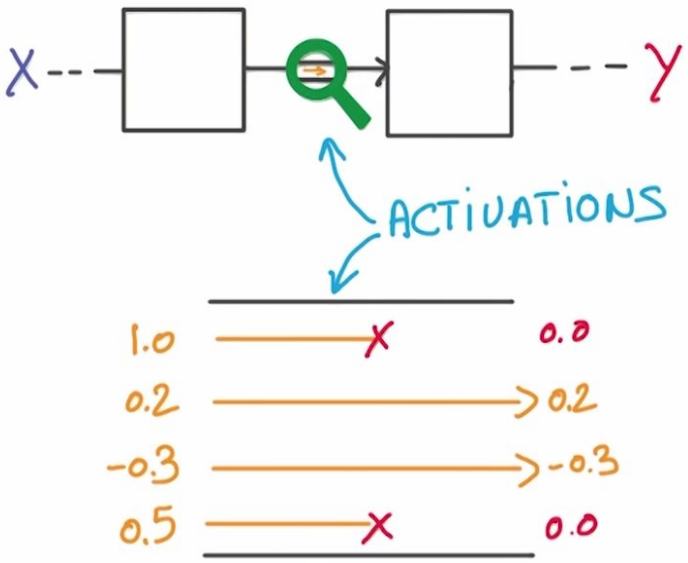
Réseaux de neurones

Généralisation



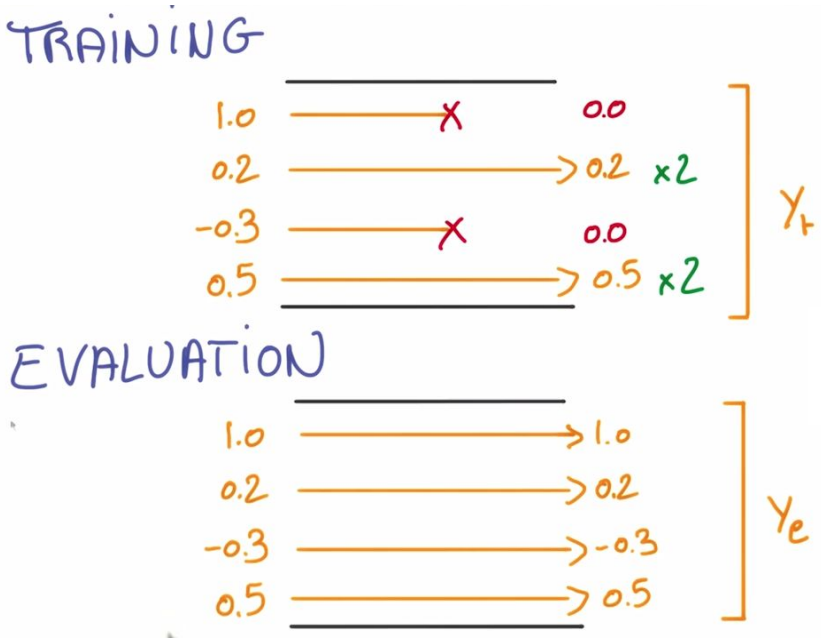
Réseaux de neurones

Dropout

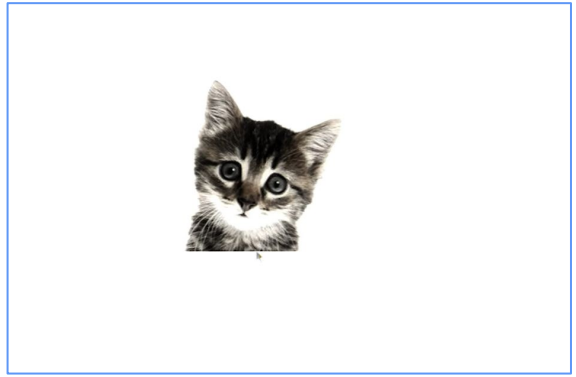


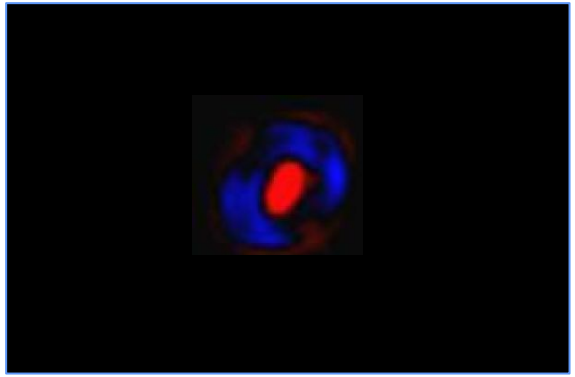
Réseaux de neurones

Dropout



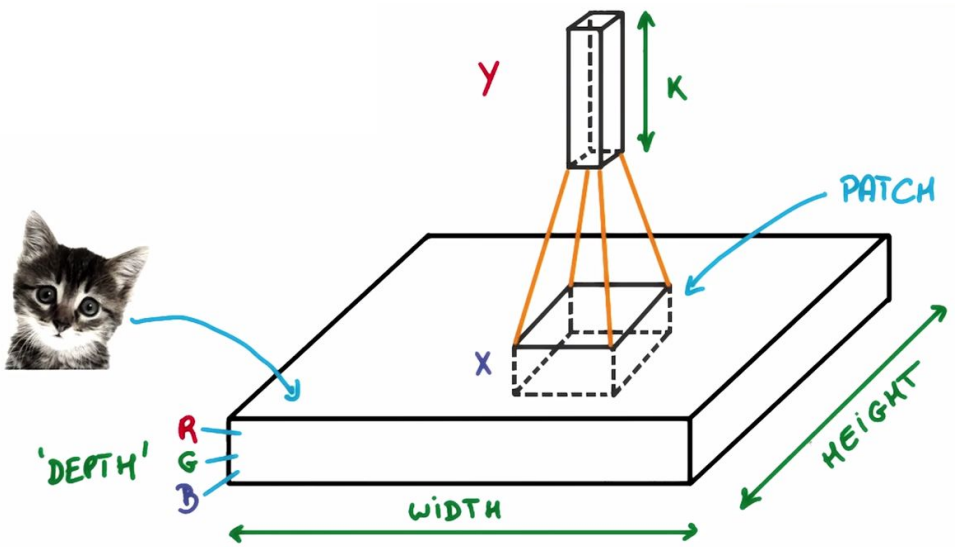
La convolution





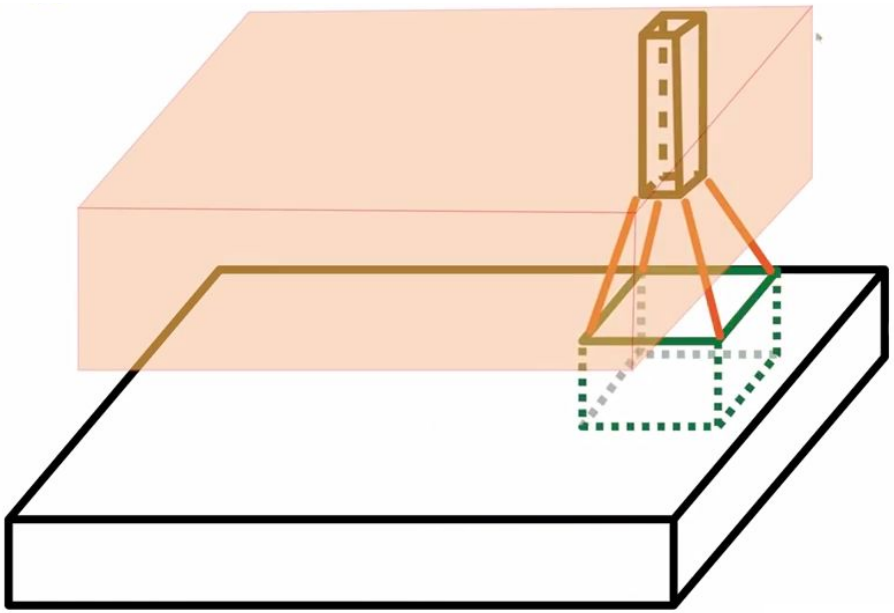
La convolution

Fonctionnement général



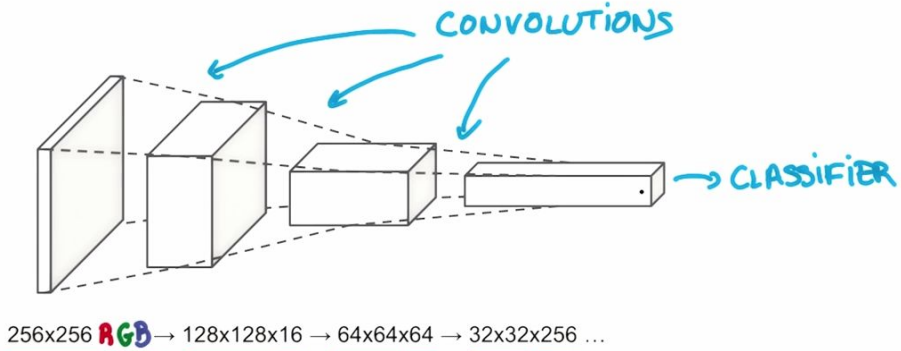
La convolution

Fonctionnement général



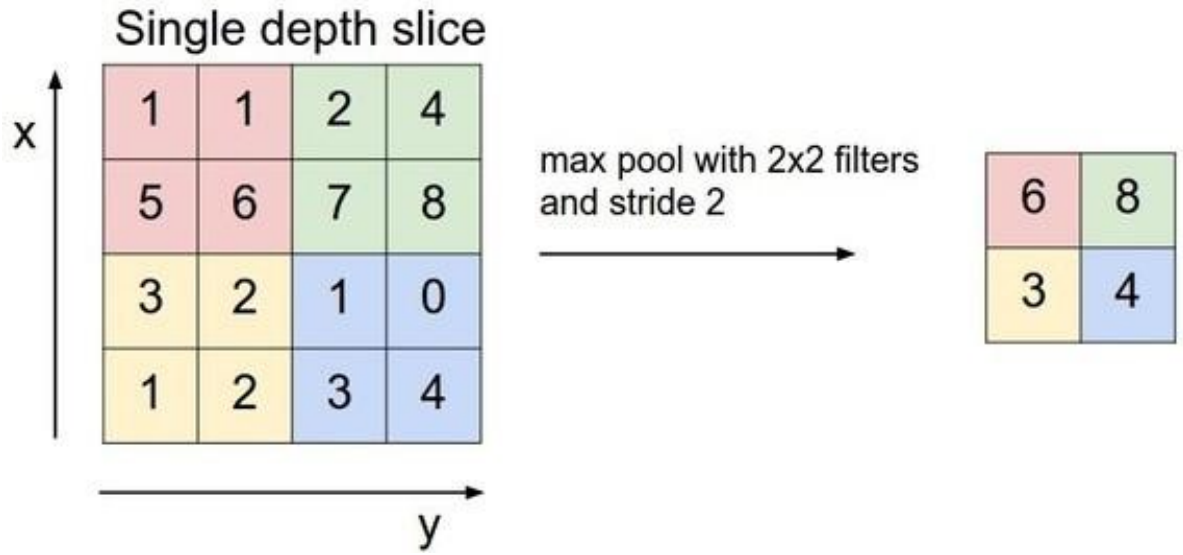
La convolution

Les pyramides



La convolution

Le pooling



La convolution

Démonstration

Typescript Classification

Tensorflow Playground