

Deep Learning par la Pratique

Convolutional Neural Networks et Keras

GIRAUD François-Marie

15 octobre 2019

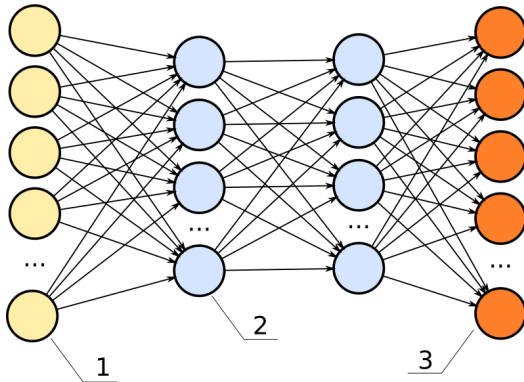


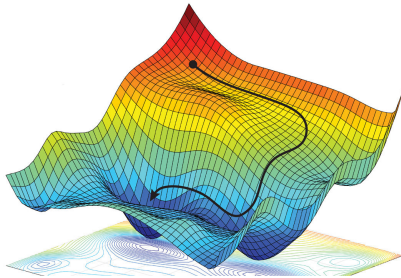
[https ://www.orsys.fr/](https://www.orsys.fr/)

Deep Learning par la Pratique

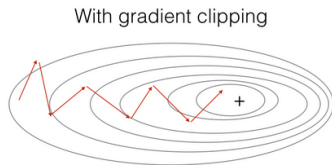
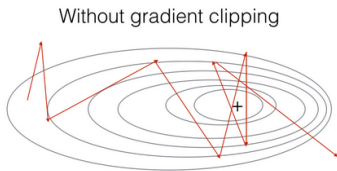
Cours 2 : Convolutional Neural Networks et Keras

Rappels



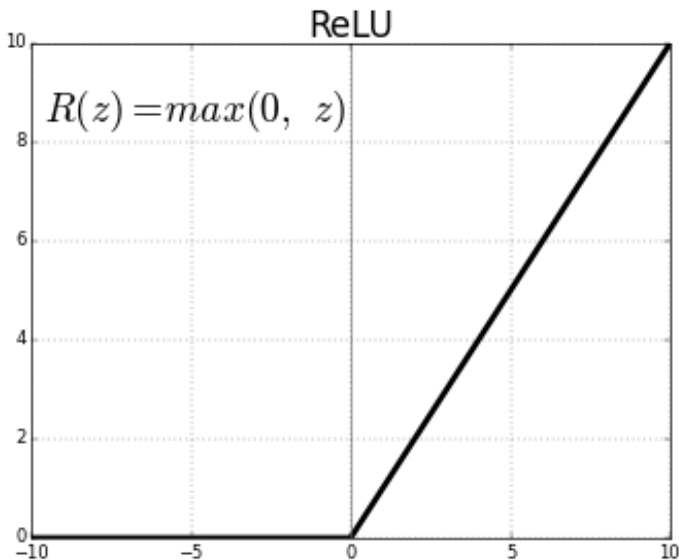


Exploding Gradient \Rightarrow Gradient clipping



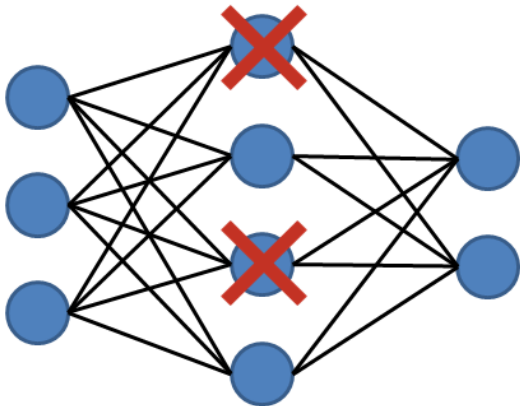
Rappels

Vanishing Gradient \Rightarrow utilisation de ReLu plutôt que les sigmoïdes



Optimisateur plus rapide que SGD

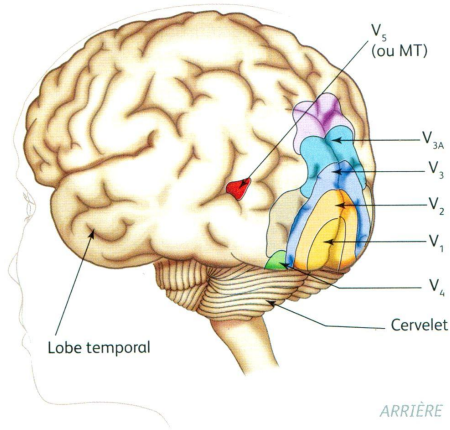
- Root Mean Square Propagation (RMSProp)
- Adaptive Gradient Algorithm (AdaGrad)
- Adaptive Moment Estimation (Adam) \Leftarrow
- ... AdaBound (2019) ?



Deep Learning par la Pratique

Convolutional Neural Networks

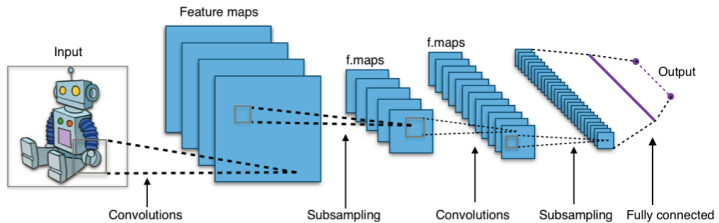
Architecture du cortex visuel



Connexion “en série” de couches

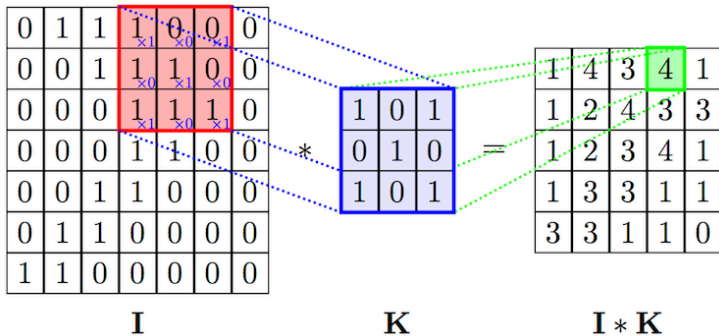
- V1 \approx orientations de lignes
- V2 \approx formes, tailles, couleurs
- V3 \approx aide à la motricité
- V4 \approx reconnaissance d'objets simples
- V5 \approx vitesse des objets
- ...

Convolutional Neural Networks



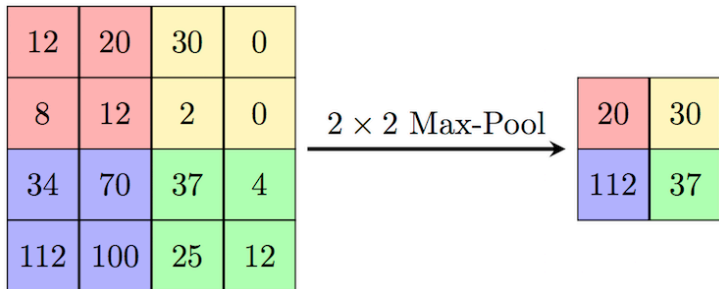
Convolutional Neural Networks

L'opérateur de **convolution**

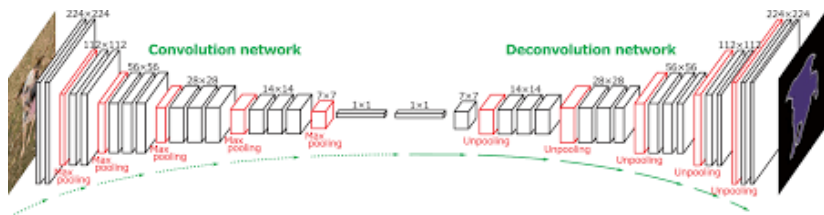


Convolutional Neural Networks

L'opérateur de **pooling**



Convolutional Neural Networks



Machine Learning

template

ML WEEK

■

■

■

■

■

■

■

■

Avez-vous des questions ?

Deep Learning par la Pratique

Travaux Pratiques : CNN et Keras

Keras Tutorial

[Colab-CNN-landscape](#)

[Colab-CNN-emotions](#)