

Deep learning par la pratique

Leçon 9 : ImageNet



Présenté par **Morgan Gautherot**



Concours de computer vision

IMAGENET

14,197,122 images, 21841 synsets indexed

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An Update to the ImageNet Website and Dataset

March 11, 2021

We are proud to see ImageNet's wide adoption going beyond what was originally envisioned. However, the decade-old website was burdened by growing download requests. To serve the community better, we have redesigned the [website](#) and upgraded its hardware. The new website is simpler; we removed tangential or outdated functions to focus on the core use case—enabling users to [download the data](#), including the full ImageNet dataset and the [ImageNet Large Scale Visual Recognition Challenge \(ILSVRC\)](#).

Meanwhile, the computer vision community has progressed, and so has ImageNet. The dataset was created to benchmark object recognition—at a time when it barely worked. The problem then was how to collect labeled images at a sufficiently large scale to be able to train complex models in laboratories. Today, computer vision is in real-world systems impacting people's Internet experience and daily lives. An emerging problem now is how to make sure computer vision is fair and preserves people's privacy. We are continually evolving ImageNet to address these emerging needs.

In a [FAT* 2020 paper](#), we filtered 2,702 synsets in the "person" subtree that may cause problematic behaviors of the model. We have updated the full ImageNet data on the website to remove these synsets. The update does not affect the 1,000 categories in ILSVRC.

In a [more recent paper](#), we investigate privacy issues in ILSVRC. 997 out of 1000 categories in ILSVRC are not people categories; nevertheless, many incidental people are in the images, whose privacy is a concern. We first annotated faces in the images and then constructed a face-blurred version of ILSVRC. Experiments show that one can use the face-blurred version for benchmarking object recognition and for transfer learning with only marginal loss of accuracy. We release our [face annotations](#) to facilitate further research on privacy-aware visual recognition.

Team members working on these new improvements: [Kaiyu Yang](#) (Princeton), [Jacqueline Yau](#) (Stanford), [Li Fei-Fei](#) (Stanford), [Jia Deng](#) (Princeton), [Olga Russakovsky](#) (Princeton).



Un problème de classification



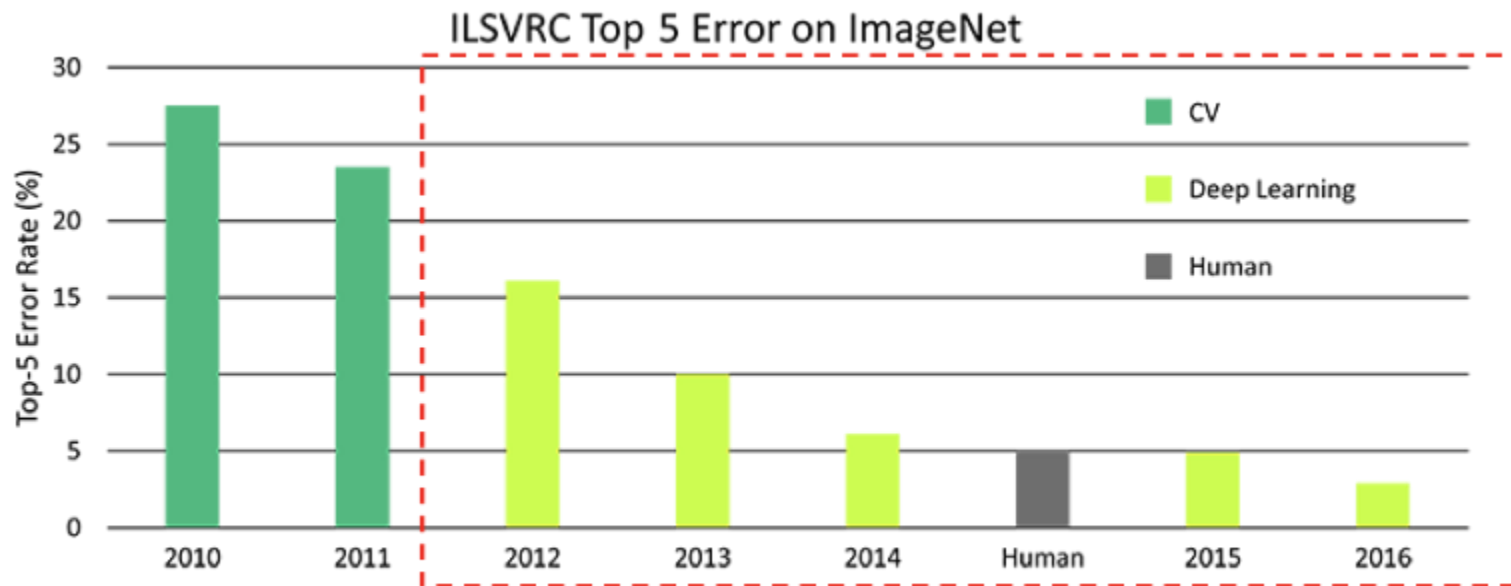


Un jeu de données d'entraînement énorme

- 1 000 classes à classifier
- 1 281 167 images pour l'entraînement
- 50 000 images pour la validation
- 100 000 images pour le test



Les performances au cours du temps



The introduction of Deep Learning techniques drove performance on image categorization from 30% error rates in 2010, down to <2% in 2017

Deep learning par la pratique

Leçon 10 : Transfer learning

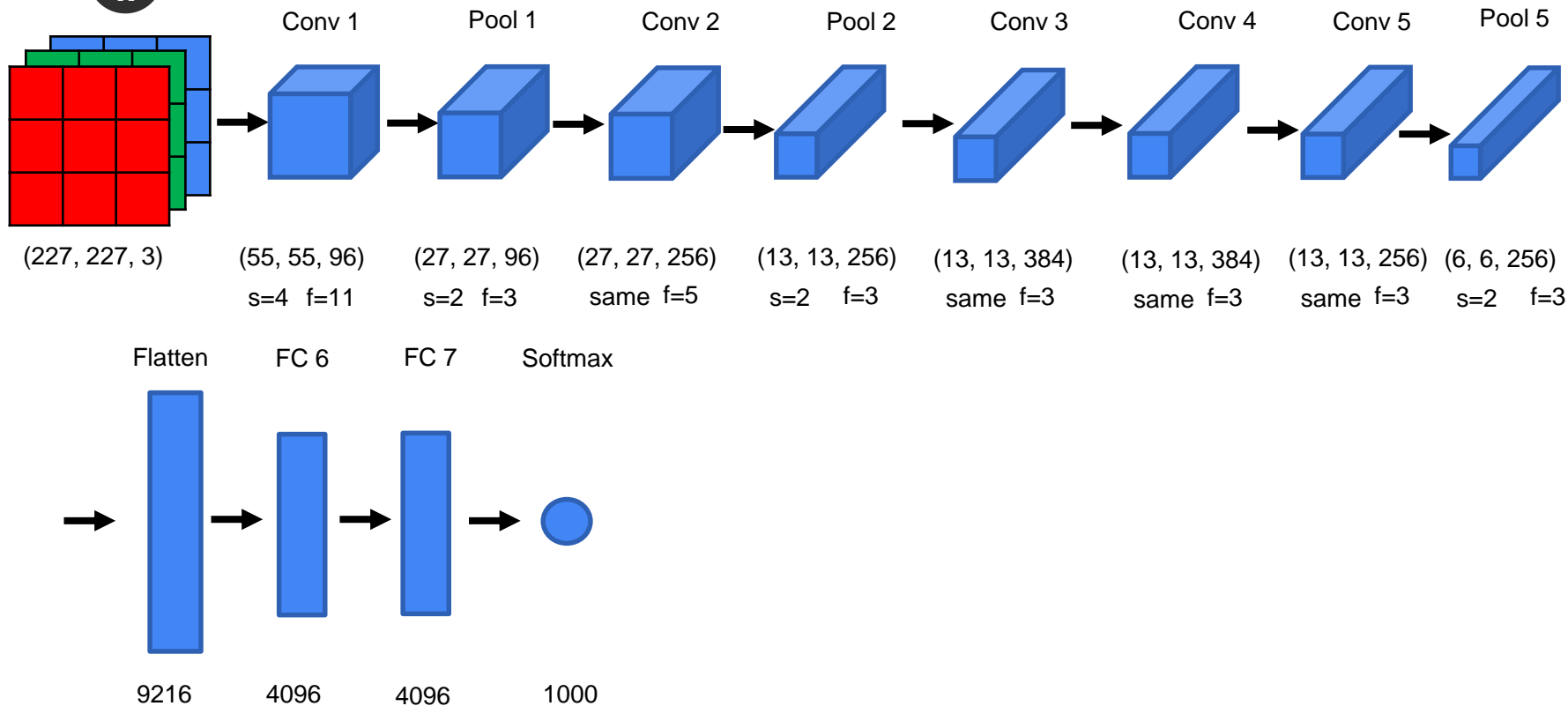


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AlexNet

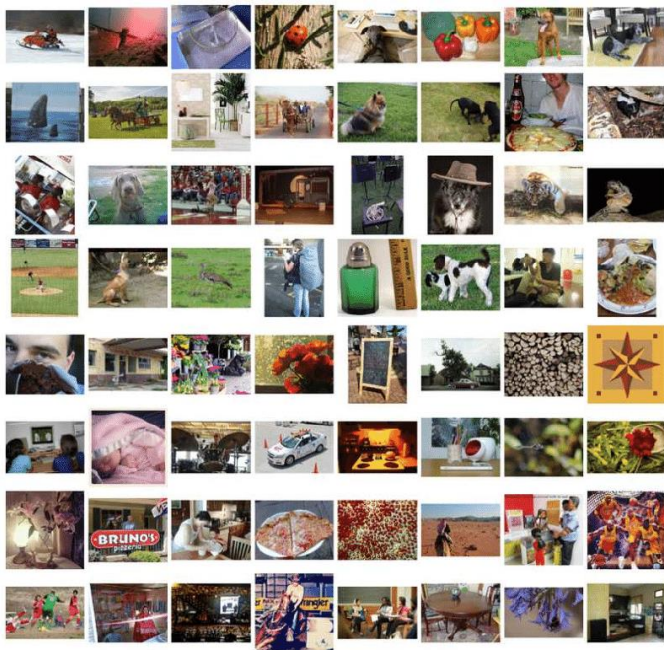
≈ 60 millions de paramètres



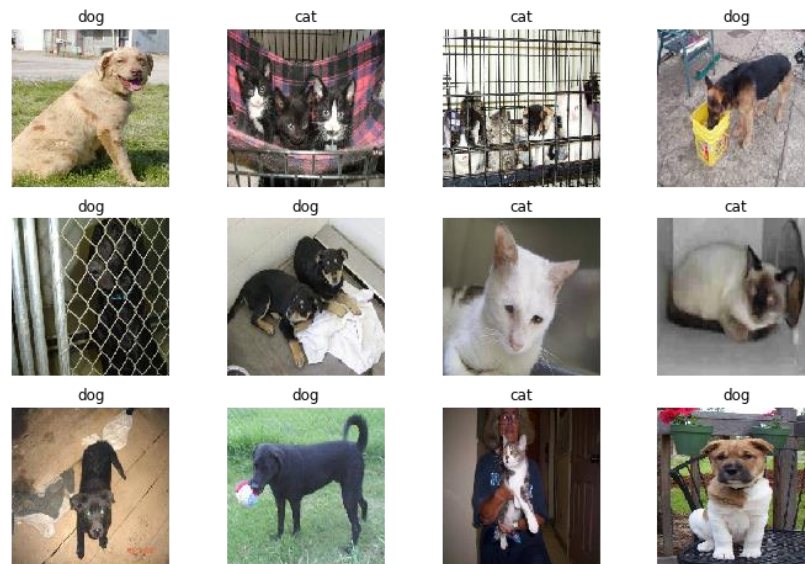


Les différents domaines d'images

Domaine d'imageNet

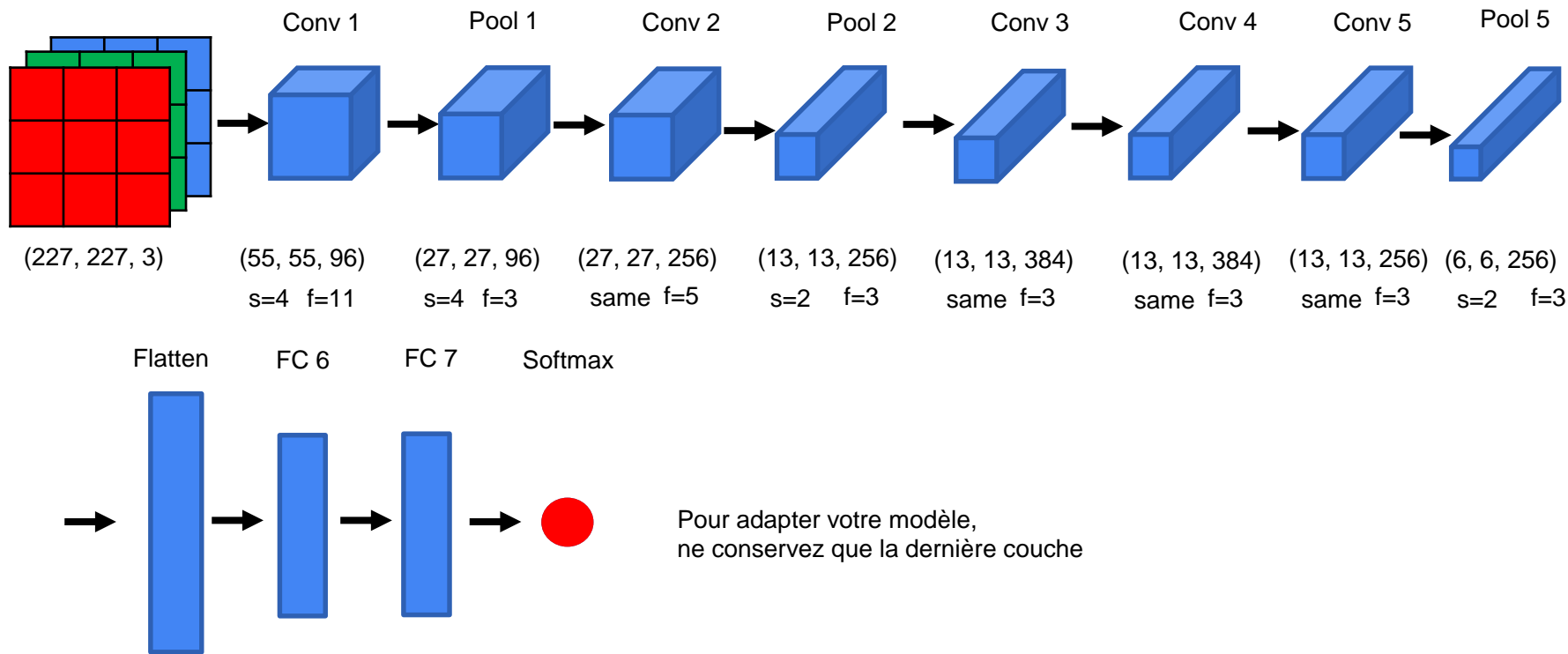


Mon domaine



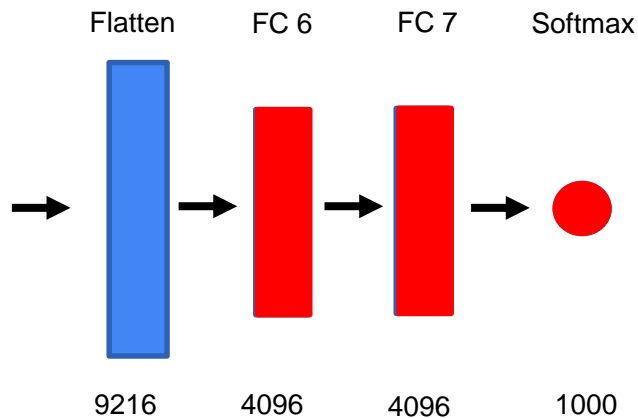
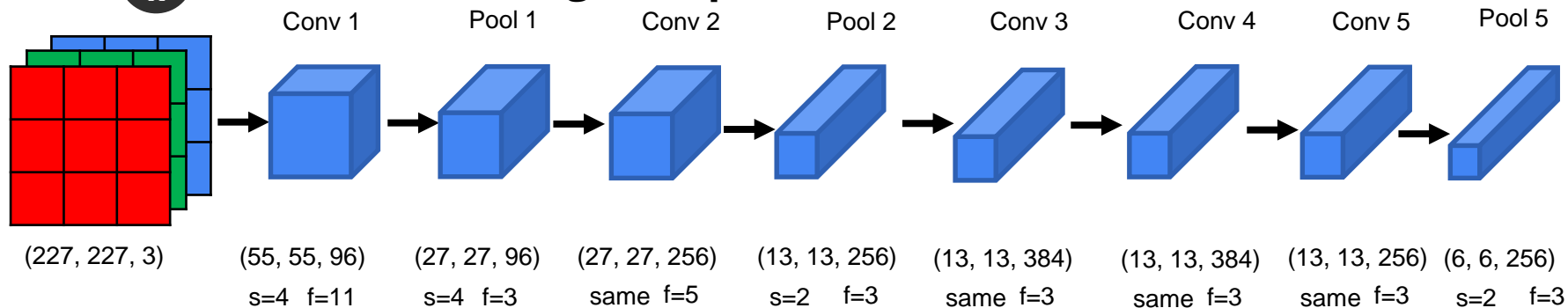


Transfer learning avec très peu de données





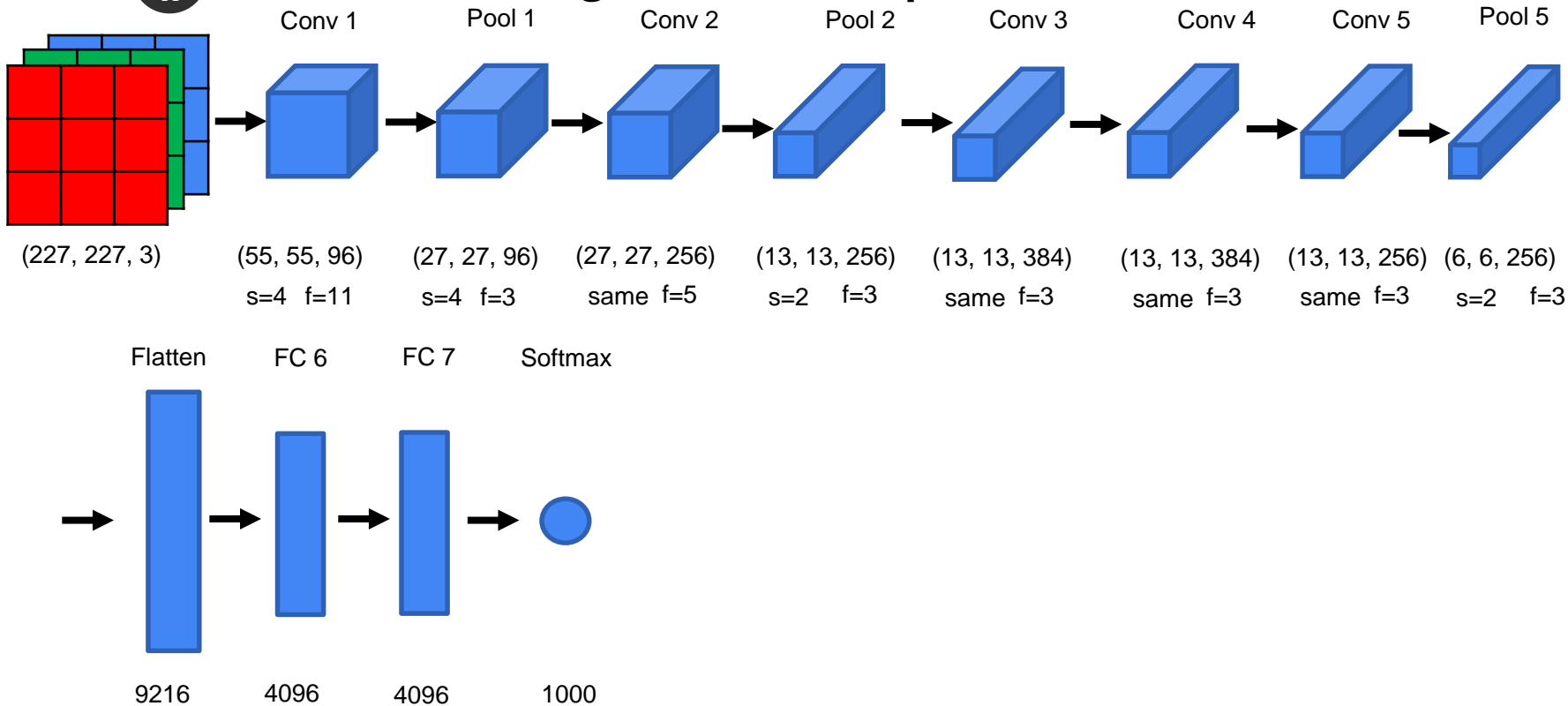
Transfer learning avec peu de données



Pour adapter votre modèle,
ne conservez que les dernières couches

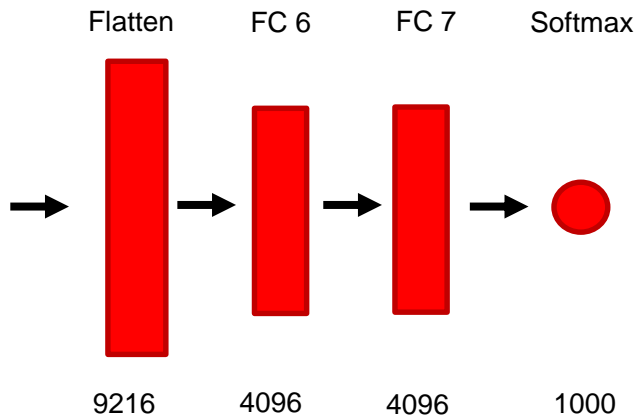
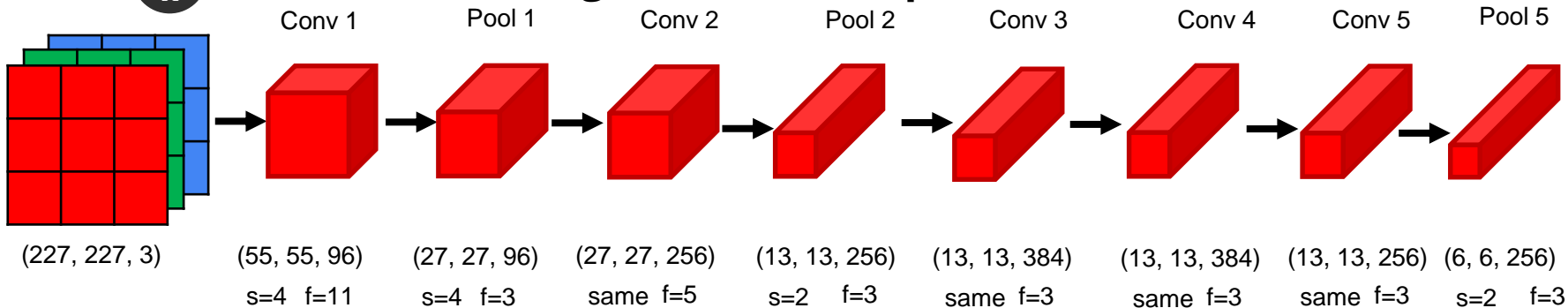


Transfer learning avec beaucoup de données





Transfer learning avec beaucoup de données



Utiliser les poids du modèle comme initialisation



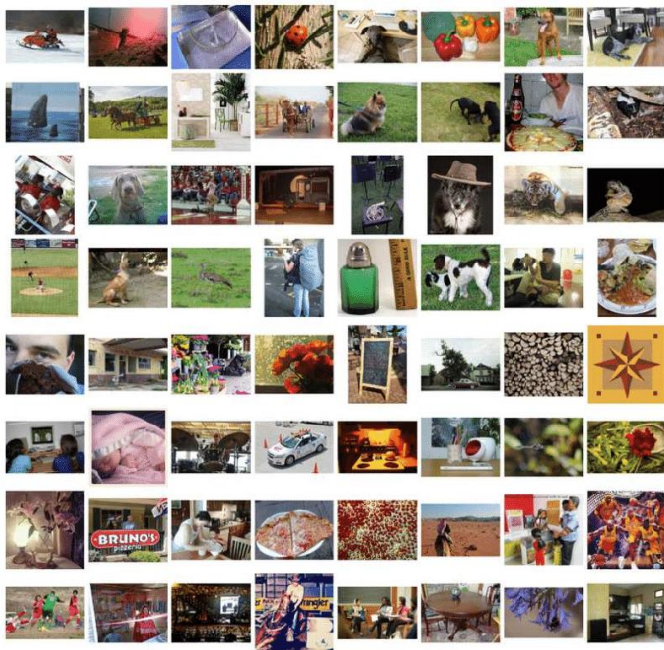
A retenir

	Domaine d'imagenet	Domaine différent d'imagenet
Petit dataset	Les dernières couches	Collecter plus de données
Grand dataset	Utiliser comme initialisation	Initialisation aléatoire



Les différents domaines d'images

Domaine d'ImageNet



Mon domaine

