

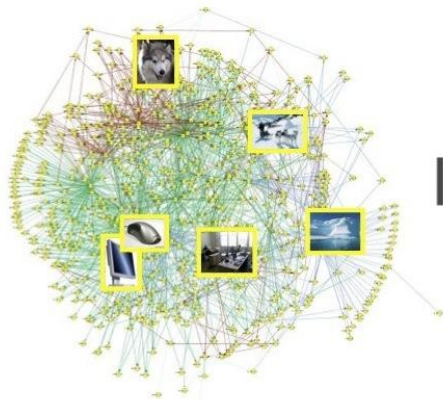
A Quick ImageNet Overview

(How well-made datasets drive ML research)

ImageNet Dataset

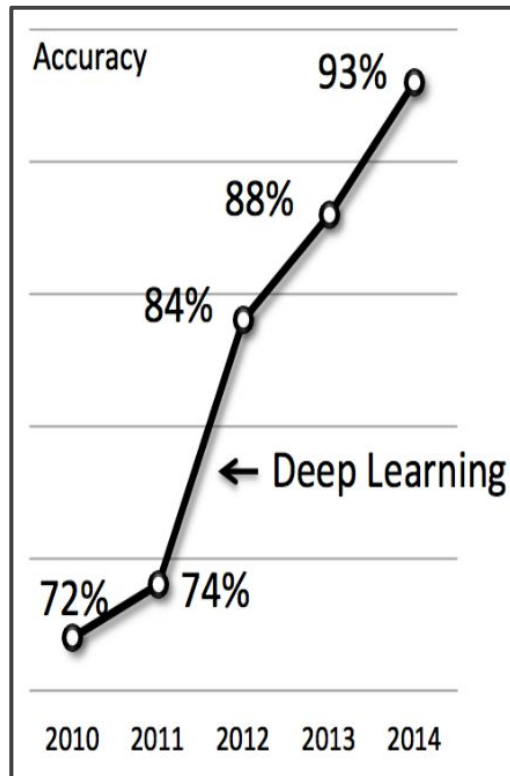
Accuracy on
ImageNet →

- Advances in machine learning very closely follow production of new datasets.



IMAGENET

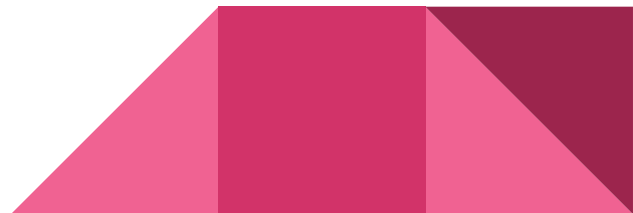
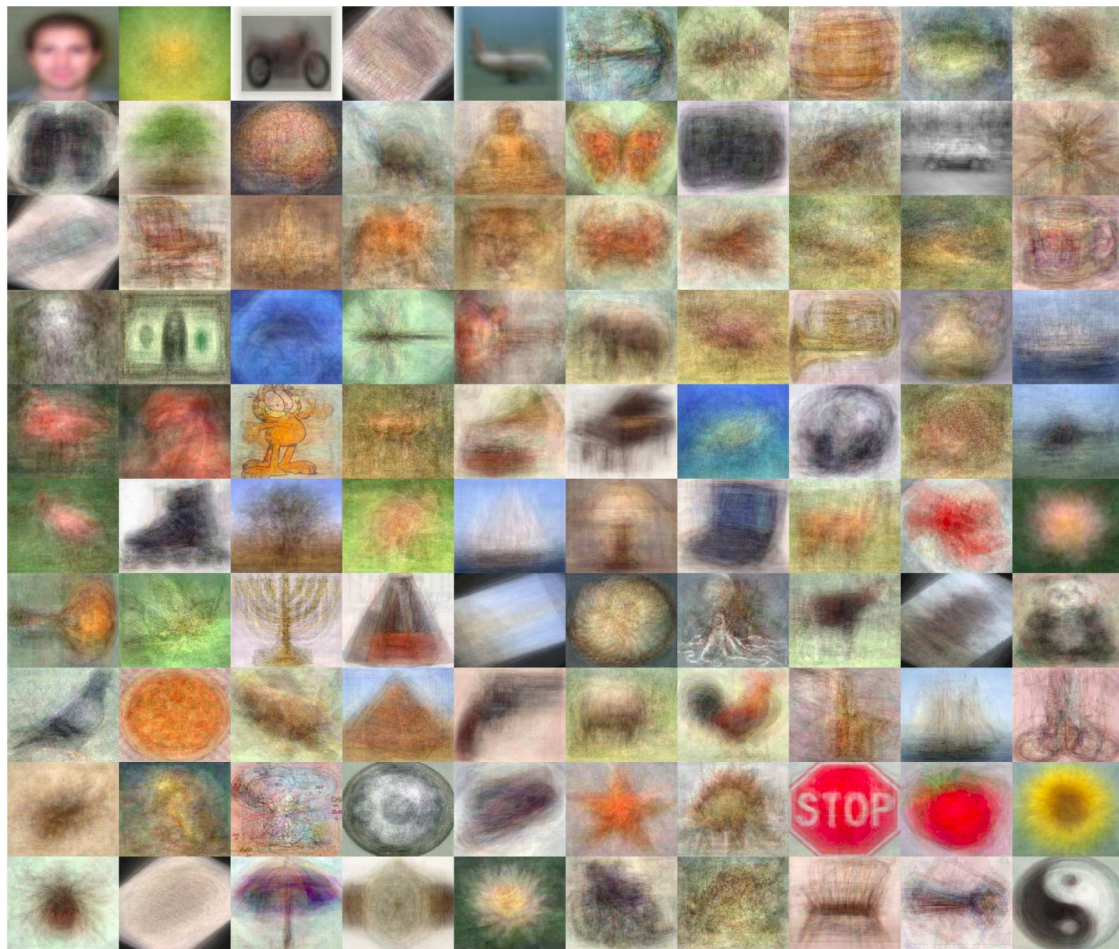
- 2012: The ImageNet Challenge helps kick off the deep learning revolution. Since it's become somewhat of an industry standard for object recognition, let's take a closer look...



Before ImageNet: Caltech 101



- 101 classes, 40-800 images in each class

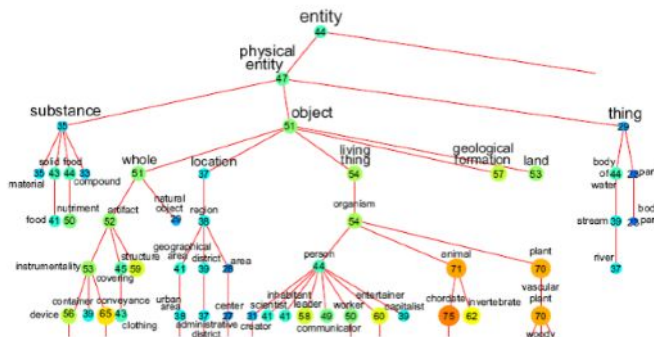




Discussion:

How would you build a better dataset
for object classification?

75.000 non-abstract nouns from WordNet



7 Online image search engines



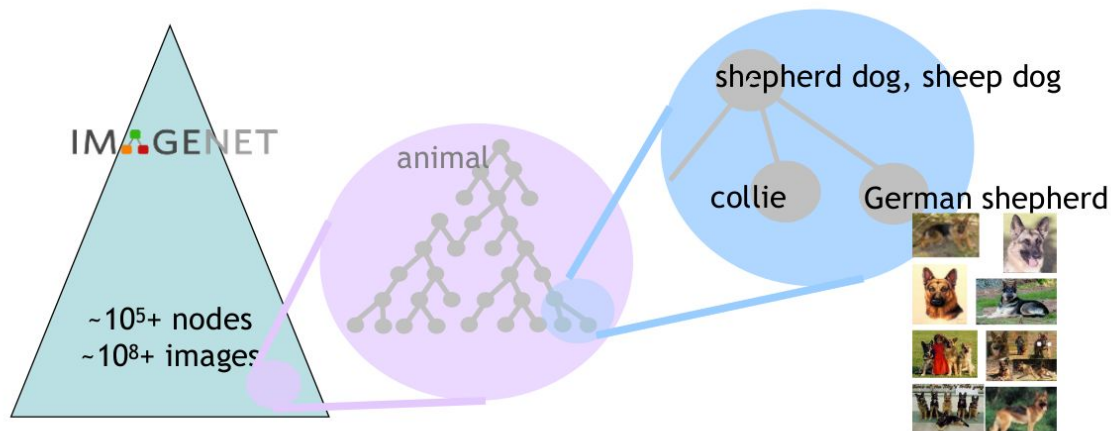
And after 1 year downloading images

Google: 80 million images



IMAGENET

- An **ontology of images** based on WordNet
 - 22,000+ categories of visual concepts
 - 15 million human-cleaned images
 - www.image-net.org

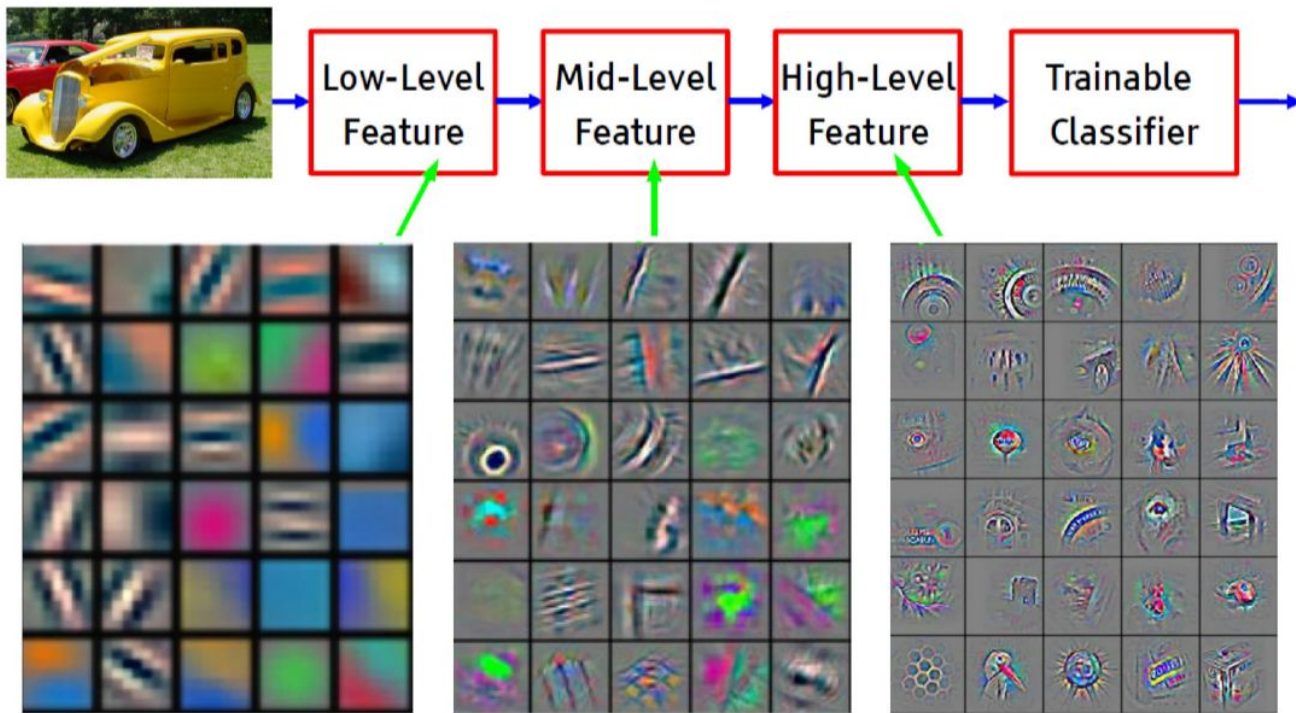


Let's explore...

Deng, Dong, Socher, Li & Fei-Fei, CVPR 2009

Low level -> high level features

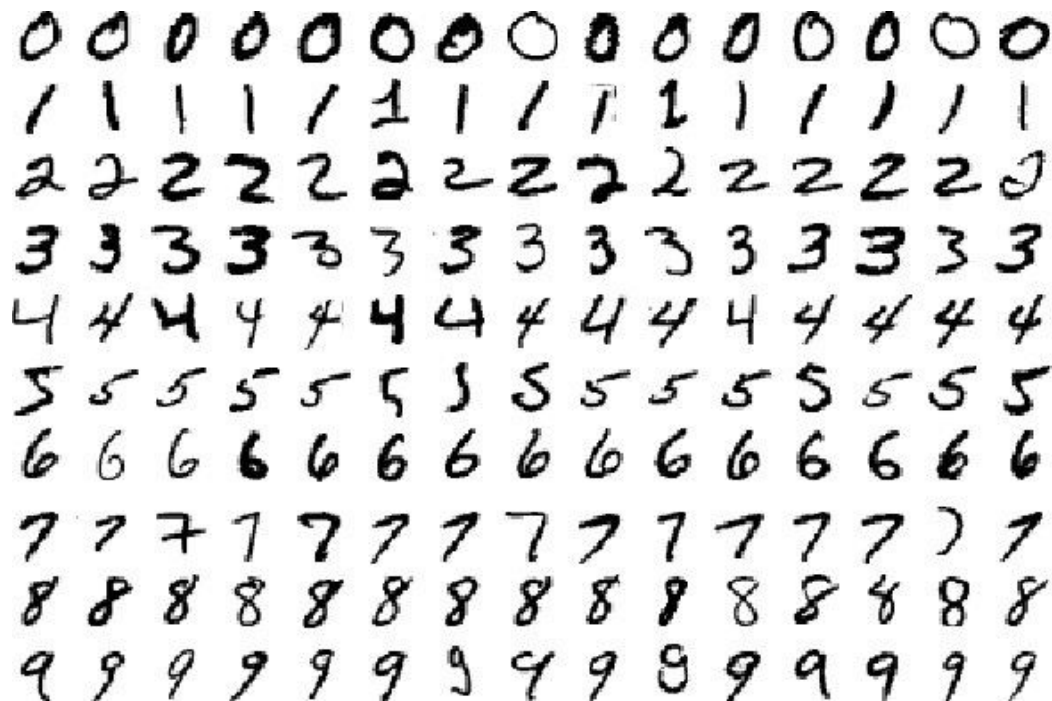
In deep learning we have multiple stages of non linear feature transformation



Feature visualization of convolutional net trained on ImageNet from [Zeiler & Fergus 2013]

MNIST Dataset

We'll work with this dataset today...



- 28x28 pixel images corresponding to digits 0-9
- Try to predict the labels!

