Deep Learning - MAI

Guided lab - CNNs

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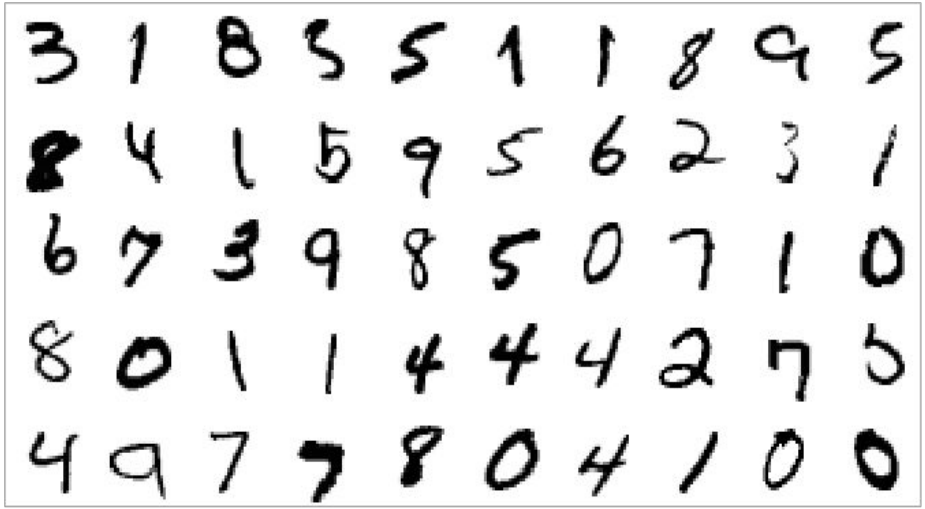
Outline

1. **Fully connected** networks applied to **MNIST**
2. **CNNs** applied to **MNIST**
3. **CNNs** applied to **CIFAR10**

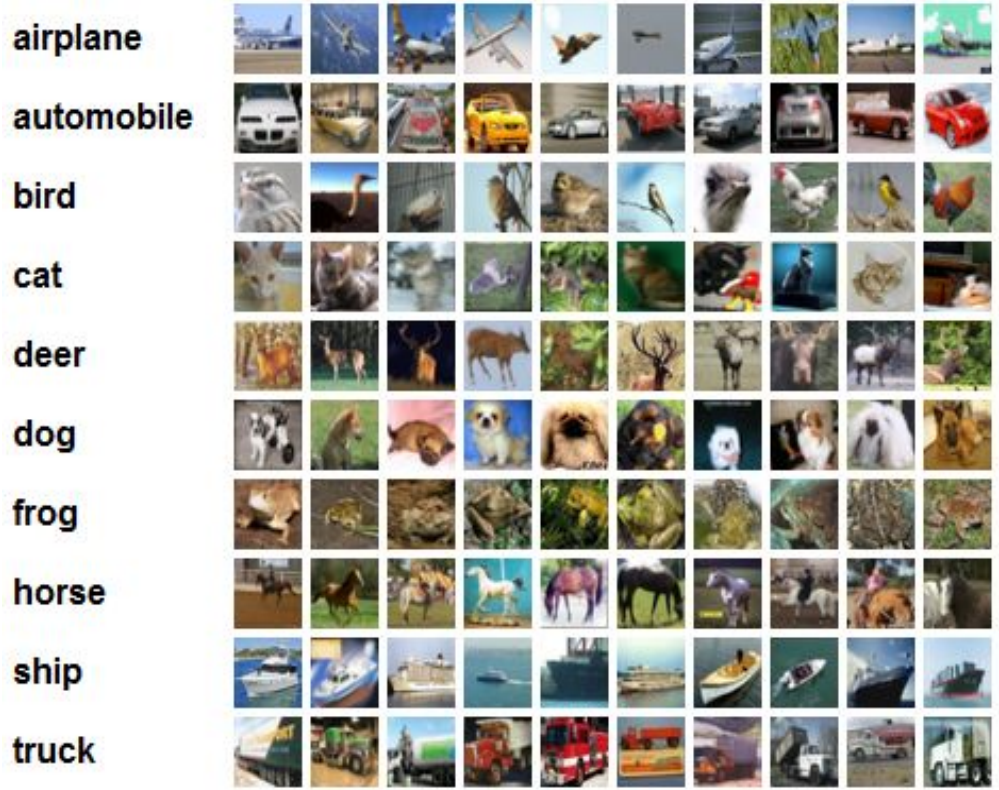
MNIST

- MNIST is a *black and white* handwritten digit recognition dataset
- First testing ground for new AI techniques
- See how far you can get using a fully connected network



CIFAR10

- CIFAR is a classification problem of low-resolution images (32x32)
- Version with 10 and 100 classes
- https://www.cs.toronto.edu/~kriz/cifar.html



Let’s look at the code

Get used to handling and loading data. It’s a big part of any DL experiment.

Look into *"flow_from_directory"* from keras to avoid memory issues, when loading large datasets.

Experiment 1 (FC & MNIST)

- Code
  - https://raw.githubusercontent.com/UPC-MAI-DL/UPC-MAI-DL.github.io/master/_codes/1.FNN-CNN/mnist_fnn_example.py
- Launcher
  - https://raw.githubusercontent.com/UPC-MAI-DL/UPC-MAI-DL.github.io/master/_codes/1.FNN-CNN/launcher.sh
- Data
  - https://s3.amazonaws.com/img-datasets/mnist.npz
  - Within P9, store in ~/.keras/datasets

"wget" to download from internet to your pc
"scp" to upload from your pc to P9

Experiment 2 (CNN & MNIST)

- Code
  - https://raw.githubusercontent.com/UPC-MAI-DL/UPC-MAI-DL.github.io/master/_codes/1.FNN-CNN/mnist_cnn_example.py
- Launcher
  - Adapt the launcher for experiment 1

Experiment 3 (CNN & CIFAR10)

- Code
  - Adapt the code from experiment 2
  - Notice its RGB
- Launcher
  - Adapt the launcher for experiment 1
- Data
  - https://www.cs.toronto.edu/~kriz/cifar-10-python.tar.gz
  - Rename to cifar-10-batches-py.tar.gz and store in ~/.keras/datasets

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