

MAI Deep Learning



Guided lab FNN & CNN

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MNIST example

- MNIST is a black and white hand-written digit recognition dataset
- See how far you can get using a fully connected network

3	1	8	5	5	1	1	8	9	5
8	4	1	5	9	5	6	2	3	1
6	7	3	9	8	5	0	7	1	0
8	0	1	1	4	4	4	2	7	5
4	9	7	7	8	0	4	1	0	0

MNIST example

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



MNIST example

- Going convolutional
 - Let's try defining a CNN instead. Try on your own, or use the following example:

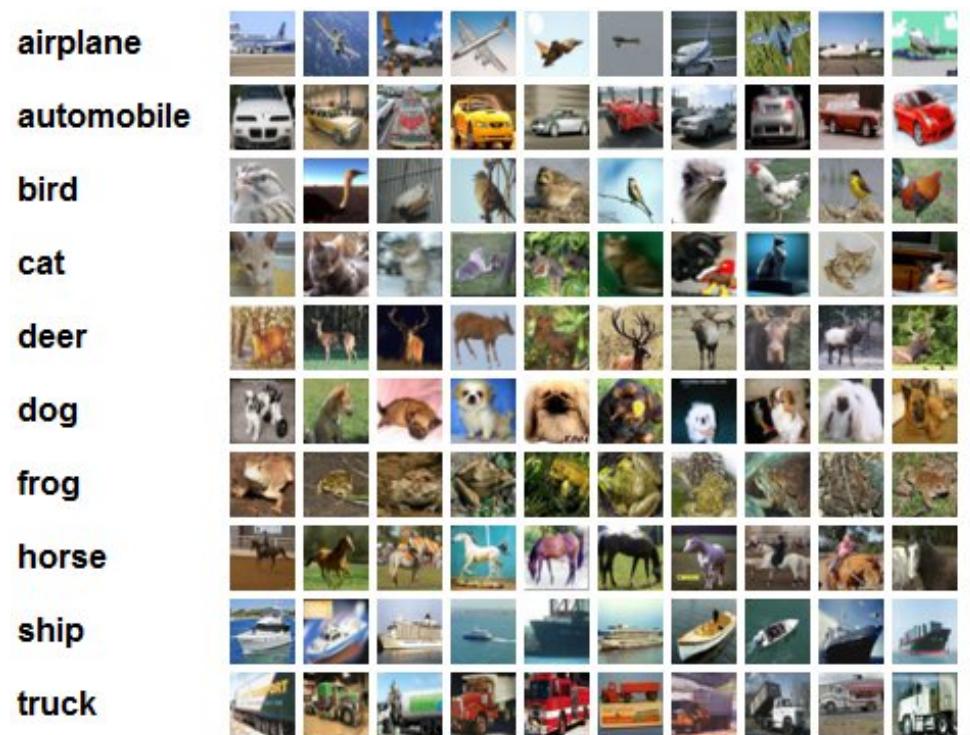
https://raw.githubusercontent.com/UPC-MAI-DL/UPC-MAI-DL.github.io/master/_codes/1.FNN-CNN/mnist_cnn_example.py



CIFAR10 example

- CIFAR is a classification problem of low-resolution images (32x32)
- <https://www.cs.toronto.edu/~kriz/cifar.htm>

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CIFAR10 example

Current Versions in P9:

```
python: 3.6.5  
keras=='2.2.4'  
tensorflow=='1.13.1'
```

- To get the data, run the command locally:

```
import keras  
from keras.datasets import cifar10  
(x_train, y_train), (x_test, y_test)  
= cifar10.load_data()
```

- Upload your local .keras/datasets files to P9

Due to version disparity, you may need to
rename the file in P9 to:

cifar-10-batches-py.tar.gz



CIFAR10 example

- Try first with a FNN
 - You will need to adapt the input
 - Now you have 3 channels
- Once you are happy with your performance, try a CNN



Moving forward

- Preparing and loading the data is an essential part of the process. Get used to it
- Loading the whole dataset is rarely feasible
- Look into "`flow_from_directory`" from keras to avoid memory issues

