

Notes de cours CADL - session-3

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November 6, 2018

- Build an autoencoder w/ linear and convolutional layers
- Understand how one hot encodings work
- Build a classification network w/ linear and convolutional layers

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1 Introduction

1.1 Generalities

- Network with 3 or 4 layers capable of performing unsupervised and supervised learning
- Unsupervised vs. Supervised Learning
 - Clustering data, reducing the dimensionality of the data, generating new data : **unsupervised learning**
 - With the **supervised learning** you know what you want out of your data (class, label that paired with every single piece of data)

1.2 Autoencoders

- Type of NW which learns to encode its inputs.
- It does not require "labels"
- Gonna see how with handwritten numbers, we will be able to see how each number can be encoded in the autoencoder

1.3 MNIST

- Load handwritten numbers images
- Calculate mean and standard deviation and plot those images
- These images are saying what's more or less constant or change over the images in the dataset. Here we try to use an autoencoder to try to encode everything that could possibly change in the image.

1.4 Fully Connected Model

- Build series of fully connected progressively smaller
- So in neural net speak, every pixel is going to become its own input neuron. And from the original 784 neurons, we're going to slowly reduce that information down to smaller and smaller numbers.

```
dimensions = [512, 256, 128, 64] # standard powers of 2 or 10
```