

# The Deep Learning Codelab

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# L'apprentissage automatique

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# Definition

- Supervised
- Unsupervised
- Reinforcement

**Machine learning is not magic**

# What is ML ?

**Machine learning is mathematics**

# What is ML ?

**Mostly, it's these maths :**

- Probability
- Statistics
- Linear algebra
- Optimisation theory
- Differential calculus

# What is Statistics

1. Identify a question or problem.
2. Collect relevant data on the topic.
3. Analyze the data.
4. Form a conclusion.

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Sadly, sometimes people forget 1.



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Statistics is about making 2–4 efficient, rigorous, and meaningful.

*OpenIntro Statistics, 2nd edition, D. Diez, C. Barr, M. Çetinkaya-Rundel, 2013.*

# What is data science ?

(Exercise : Is this the same question as the last slide ?)

1. Define the question of interest
2. Get the data
3. Clean the data
4. Explore the data
5. Fit statistical models
6. Communicate the results
7. Make your analysis reproducible

# What is data science ?

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What the public thinks.

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Where we spend most of our time.

# What is data science ?

(Exercise : Is this the same question as the last slide ?)

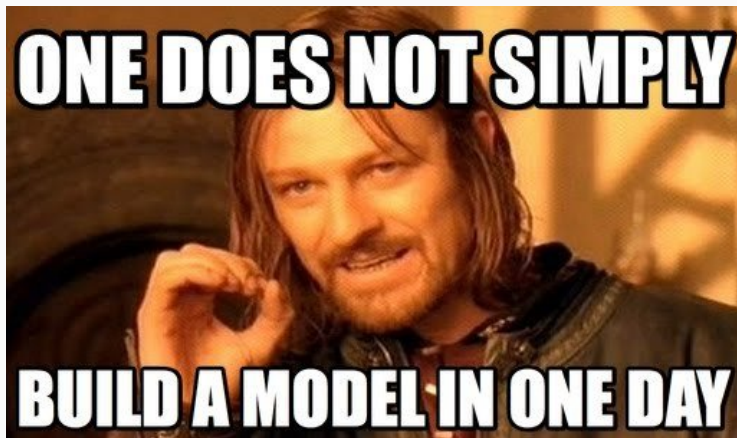
1. Define the question of interest
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The easiest part to forget.

# What is data science?

*[http://simplystatistics.org/2015/03/17/  
data-science-done-well-looks-easy-and-that-is-a-big-  
problem-for-data-scientists/](http://simplystatistics.org/2015/03/17/data-science-done-well-looks-easy-and-that-is-a-big-problem-for-data-scientists/)*

## What is data science ?



Typically a vector space

Features are dimensions



**Feature extraction**

**Feature engineering, synthetic features**

# Feature Engineering

1. Brainstorm
2. Pick some
3. Make them
4. Evaluate
5. Repeat

# Les réseaux de neurones artificiels

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# Hey I'm a frame

Hello, world !

# Les réseaux à convolutions

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# Hey I'm a frame

Hello, world !

# Keras

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# Hey I'm a frame

Hello, world !



# MNIST

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# Hey I'm a frame

Hello, world !

**Infra**

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# Hey I'm a frame

Hello, world !

# Modèle

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# Hey I'm a frame

Hello, world !

## Ressources

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# Hey I'm a frame

Hello, world !



## Q & A

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