Machine Learning

Week 1 - Introduction

About the course

Your professor: Gilles Ferone

5 years at ECE - Paris

2010 - ECE (promo 2015)

2012 - Semester abroad, Kuala Lumpur Malaysia

2013 - Master in Embedded Systems (Majeure SE)

2014 - Semester abroad at UCSD, California

5 years of career in software

2015 - Full stack engineer

2016 - Machine Learning Engineer

2020 - and professor at ECE <- *pay attention in class you might be back one day*

Subjects of predilection:

NLP (Natural Language Processing)
Autograding systems

AI system engineering (Neural nets, transformers, evaluation)

Full stack engineering (Javascript, python, ruby)

What you will learn in this course

Theory:

- Definitions of Data Science and Machine Learning
- Overview of the Machine Learning Industry
- Mathematical concepts for analysing and modelling data (Linear regression and Logistic regression, decision trees)
- Architect a Machine Learning solution
- Evaluate statistical models

Practice:

- Setup a Python working environment
- Leverage Python libraries
- Using python to load and display data
- Using python to produce statistical models and evaluate them

Resources for the course

Slides:

- **My slides:** Will introduce and summarize each week's course. Contain links to resources I encourage you to look at.
- **Toufic Zaraket's slides (2019):** Will contain the content of each week's topic.

Both slides will be available on Campus

Jupyter Notebooks:

- Practice will be based on completing code in Python
- All code will run on Python 3 using Jupyter Notebooks.

Course planning

Each session:

- ~1h30 Theory - based on slides
- ~1h30 Practice - based on the notebook

In-between sessions:

- 1 assignment to complete after each session
  - A sample will be graded (Note de suivi)
- 1 Scientific paper to read
  - Expect quizzes for some of them

Types of Machine Learning

Supervised Learning

https://www.autodraw.com/

Unsupervised Learning

http://projector.tensorflow.org/

Reinforcement Learning

https://gym.openai.com/

Working Environment

Installing Conda

Mac:
https://docs.conda.io/projects/conda/en/latest/user-guide/install/macos.html

Windows:
https://docs.conda.io/projects/conda/en/latest/user-guide/install/windows.html

Installing Jupyter Notebook

https://jupyter.org/install

Conclusion

This week:

- Definitions of Data Science and machine Learning
- Introduction to the three types of Machine Learning: Supervised, Unsupervised, Reinforced
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