Machine Learning : empirical applications for finance (prerequisite : Python for Finance) (This course corresponds to the bloc 2/3 of the Certificate "Fundamentals of Data Science")

ECTS : 3

Description du contenu de l'enseignement :

Basics of ML

- Definitions, approaches and applications.
- Data mining (DM) : definitions and links with ML.
- Classification and regression problems.
- Building and evaluating an ML model.
- Presentation of the main approaches of ML/DM.
- Application I.

Decision Trees :

- Definitions and algorithms.
- Advanced methods based on DL : Bagging, Boostring and Random forests.
- Application II : Making a decision in finance.

Neural networks:

- Definitions.
- Learning in NN : grandient descent and Backpropagation.
- Advanced methods based on NN (Deep learning).
- Application III : : Stock pricing.

Reinforcement Learning :

- Definitions : Agents and environnments.
- Markovian Decision Process (MDP).
- Policies and optimal policies.
- Q-learning.
- Application IV : Trading.

Compétence à acquérir :

Building Machine Learning (ML) models for Finance problems. Using ML Python library (and in particular sickit-learn).

Mode de contrôle des connaissances :

Two/Three assignments (building a model + Python programming).