

- Faculté des sciences
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Introduction to machine learning (3IN1042)

Filières concernées	Nombre d'heures	Validation	Crédits ECTS
Bachelor en science des données	Cours: 2 ph Exercice: 2 ph	Voir ci-dessous	6

ph=période hebdomadaire, pg=période globale, j=jour, dj=demi-jour, h=heure, min=minute

Période d'enseignement:

- Semestre Automne

Equipe enseignante

Christos Dimitrakakis
Hortence Yiepnou Nana
Elif Yilmaz

Contenu

This course gives a methodological, theoretical and practical introduction to machine learning. Topics covered:

- Learning problems: estimation, prediction, classification, regression
- Pipeline: Experiment design, data collection and processing
- Data analysis: generalisation, model selection, testing and simulation
- Principles: loss minimisation, Bayesian inference
- Algorithms: stochastic gradient descent
- Models: nearest neighbours, neural networks, graphical models
- Applications: healthcare, image processing, text prediction/generation
- Python: pandas, numpy, matplotlib, scikitlearn, statsmodels

Forme de l'évaluation

Continuous evaluation

- Weekly assignments (40%)
- Project (60%)

The assignments are structured so that you can properly prepare your project. You must pass both the assignments and the projects to successfully complete the course.

Modalités de rattrapage

If you have narrowly failed your project (3-4/6), an oral exam will be offered. Otherwise, the project has to be resubmitted. Failing to submit the 75% of the weekly assignments requires a repetition of the course.

Pré-requis

- Probability
- Calculus
- Linear Algebra
- Python

Forme de l'enseignement

- 4 hours of mixed lectures, demos, exercises, group work and tutorials
- Short videos and course notes
- Office hours: 14:00-16:00 on Friday (by appointment).

Objectifs d'apprentissage

URLs	1) https://github.com/olethrosdc/machine-learning-neuch
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Au terme de la formation l'étudiant-e doit être capable de :

- Communicate results
- Simulate pipelines
- Explain algorithms
- Formulate scientific questions
- Compare methods
- Design experiments
- Estimate effects
- Identify learning problems

Compétences transférables

- Communicate research
- Formulate problems
- Synthesise methods
- Present results
- Develop project
- Explain methods and algorithms