DH-406

Machine learning for DH

Salzmann Mathieu

Cursus	Sem.	Type
Digital Humanities	MA1, MA3	Obl.
Digital Humanities		Opt.
Learning Sciences		Opt.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	Written
Workload	120h
Weeks	14
Hours	**4 weekly**
Lecture	2 weekly
Exercises	2 weekly
Number of positions	

Summary

This course aims to introduce the basic principles of machine learning in the context of the digital humanities. We will cover both supervised and unsupervised learning techniques, and study and implement methods to analyze diverse data types, such as images, music and social network data.

Content

Supervised learning:
1. Linear regression and classification
2. Kernel methods
3. Deep learning

Unsupervised learning:
1. Dimensionality reduction
2. Clustering
3. Topic models

Keywords

Machine learning, digital humanities, supervised and unsupervised learning

Learning Prerequisites

Required courses

Programming (python), Linear algebra, Probability and Statistics

Learning Outcomes

By the end of the course, the student must be able to:

- Choose an appropriate learning algorithm for a given problem
- Derive the mathematical formulations of basic supervised and unsupervised learning algorithms
- Develop basic supervised and unsupervised learning models
- Explain the differences between different machine learning algorithms
- Assess / Evaluate the advantages and limitations of different machine learning algorithms

Transversal skills

- Assess progress against the plan, and adapt the plan as appropriate.
- Continue to work through difficulties or initial failure to find optimal solutions.

Teaching methods

Ex cathedra with exercises, computer sessions

Expected student activities

Attend the lectures, complete the exercises, implement and test the studied methods using python

Assessment methods

Final exam with both theoretical and practical problems

Supervision

Office hours	No
Assistants	Yes
Forum	Yes

Resources

Virtual desktop infrastructure (VDI)

No

Bibliography

Christopher M. Bishop, Pattern Recognition and Machine Learning
Kevin P. Murphy, Machine Learning: A Probabilistic Perspective

Ressources en bibliothèque

- Kevin P. Murphy, Machine Learning: A Probabilistic Perspective
- Christopher M. Bishop, Pattern Recognition and Machine Learning

Moodle Link

- https://go.epfl.ch/DH-406