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

Moodle Link
• https://go.epfl.ch/DH-406