

Master Économie Méthodes de prévision

Responsable	Descriptions	Informations
Pierre MICHEL pierre.michel@univ-amu.fr	Code : BECCV33A Nature : Élément constitutif Domaines : Droit, Économie, Gestion	Composante : Faculté d'Économie et de Gestion

LANGUE(S) D'ENSEIGNEMENT

Anglais

CONTENU

This course introduces the main predictive methods based on machine learning. The main objective is to provide students with the knowledge necessary to understand supervised and unsupervised learning methods.

Course outline:

1. Introduction
2. Introduction to Machine Learning
3. Reminders of linear algebra
4. Supervised Learning (parametric methods: Linear Regression, Batch Gradient Descent, Stochastic Gradient Descent)
5. Supervised Learning
6. Introduction to Kaggle
7. Linear algebra and normal equation
8. Code vectorization
9. Classification methods
10. Parametric methods (logistic and softmax regression)
11. Classification and regression trees (CART)
12. Advanced tree-based methods (Bagging, Random Forest, Boosting) and variable importance
13. Neural networks
14. Introduction to neural networks
15. Training a neural network
16. Deep learning in Python (keras)
17. Convolutional neural networks (CNN)
18. Introduction to CNN
19. Training a CNN
20. Examples with keras
21. Unsupervised learning
22. Complements on unsupervised learning (clustering versus density estimation)
23. Clustering methods (k-mans, HCA, DBSCAN)
24. Recent approaches in clustering (CUBT, LDA)

Please note that other methods will be taught in Ewen Gallic's course.

COMPÉTENCES À ACQUÉRIR

- Understand how supervised and unsupervised methods work
- Understand the theory (linear algebra and optimization) underlying those methods
- Being able to code (in Python or R – choice up to students) some algorithms from scratch

MODALITÉS D'ORGANISATION

- Sessions alternating theoretical presentations and applications.
- Hands-on mini-projects on toys datasets (Housing, MNIST, Fashion-MNIST, Kaggle datasets, etc).
- The applications will be carried out on computers.

BIBLIOGRAPHIE, LECTURES RECOMMANDÉES

- Hastie, Trevor, Robert Tibshirani, et Jerome Friedman. The Elements of Statistical Learning: Data Mining, Inference, and Prediction. 5e éd. New York, NY: Springer-Verlag New York Inc., 2009.
- Geron, Aurelien. Hands-On Machine Learning with Scikit-Learn, Keras, and Tensorflow: Concepts, Tools, and Techniques to Build Intelligent Systems. 2nd édition. Sebastopol, CA: O'Reilly Media, Inc, USA, 2019.

- Online Course: CS229 - Machine Learning, Stanford University.

PRÉ-REQUIS OBLIGATOIRES

Econometrics, Statistics, Basic Python programming skills (numpy, matplotlib).

PRÉREQUIS RECOMMANDÉS

Advanced Python programming skills (numpy, matplotlib, scikit-learn, scipy).

VOLUME HORAIRE

- Volume total: 24 heures
- Cours magistraux: 24 heures

CODES APOGÉE

- BECC33A [ELP]

M3C

Aucune donnée M3C trouvée

POUR PLUS D'INFORMATIONS

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