

Python: Introduction to Machine Learning with Python

Duration: 3 days

Audience: Analyste de données

Who is this training for?

Beginner to intermediate developers wishing to discover machine learning
Data analysts wishing to integrate predictive techniques into their analyses
IT professionals wishing to learn about applied artificial intelligence
Students or professionals retraining for data professions
Anyone with a basic background in programming and wishing to explore machine learning with Python

Training objectives

- Understand machine learning and its subfields
- Familiarize yourself with some common machine learning algorithms
- Choose the right algorithm to use for your case
- Acquire the expertise to analyze the results of machine learning algorithms

Summary

This course provides a structured and accessible introduction to the fundamental concepts of machine learning using Python. Participants learn the basics of machine learning, as well as the main techniques for preparing, analyzing and modeling data.

Course outline

Introduction:

- Supervised, Unsupervised and Reinforcement Learning
- Classification, Regression, Structure Prediction
- Model Evaluation: Metrics • Hyperparameter and Model Selection
- Introduction to Scikit Learn
- Data Types and Method

Selection Guide Classification:

Introduction with OCR:

- K Nearest Neighbor Algorithm
- Decision Trees and Visualization
- Set Method • Support Vector Machines (SVM)
- Visualization of Results Classification:

Advanced concepts with sentiment analysis:

- Data pre-processing for training
- Dimensionality reduction
- Batch training
- Interpretability (importance of weights, LIME)

Regression:

- Linear regression
- Nonlinear regression with kernel methods
- Outlier data detection and management
- Time series: Challenges, decomposition and prediction methods
- Time series: non-stationary regression and autoregressive models

Recommender System: Case Study:

- Collaborative Filtering by User
- Collaborative Filtering by Article
- Advanced Concepts and Algorithms

Unsupervised Learning:

- Clustering: K-Means, Hierarchical Methods, Density Methods
- Dimensionality Reduction: PCA, t-SNE
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Generative Models:

Introduction to Variational Autoencoders and Autoencoders Debugging How-To:

- Overfitting Testing: Model and Data Size
- Pipeline Testing
- Exploring Alternative Metrics

Approach and methodology

Practical and progressive approach combining focused theory and guided workshops. Participants discover the fundamental concepts of machine learning through concrete exercises in Python, promoting an immediate application of the learning. They experiment with the different stages of a machine learning project: data preparation, algorithm selection, model training, and performance evaluation. The training favours interactivity, experimentation and the resolution of practical cases in order to develop skills that are directly transferable in a professional context.

Prerequisites

Knowing how to program in Python

Recommendations

Review: the basics of Python Familiarize yourself with: data manipulation (tables, lists, files) Identify your objectives: discover machine learning understand algorithms analyze data