

Machine Learning in Finance

10th – 12th October 2018

Overview

Machine Learning in Finance is a three-day workshop, covering the theory, implementation and use of machine learning models in finance. The workshop will be led by Miquel Noguer i Alonso.

This workshop is available to attend either in person in London or online.

Participants will learn the mathematical and statistical aspects of the modern quantitative analysis modeling. We will see machine learning models theory and practical implementations. Machine learning python code and extensive materials will be provided.

Content

1. **Big Data in Finance Landscape**
2. **Alternative data**
3. **Econometrics and financial modeling review**
 - a. Univariate and Multivariate modeling
 - b. Continuous and Discrete models
 - c. Time Series Models
 - d. Linear Factor Models
4. **Machine Learning Definitions and framework**
5. **Machine Learning Modeling and Metrics**
 - a. Preprocessing
 - i. Features scaling and selection
 - ii. Dimensionality Reduction
 - iii. Sampling
 - b. Learning
 - i. Model Selection
 - ii. Cross-Validation
 - iii. Performance Metrics
 - iv. Hyperparameter optimization
 - c. Evaluation
 - d. Prediction
6. **Supervised Learning**
 - a. Classification
 - i. Logistic regression

- ii. K-Nearest Neighbors
 - iii. Classification and Regression Trees
 - iv. Support Vector Machines
- b. Regression
 - i. Linear Regression
 - ii. Penalized Linear Regression : Lasso and Ridge
 - iii. Non-Linear Regressions
 - iv. Deep Regressions
 - c. Ensemble models
 - i. Bagging
 - ii. Boosting – Adaboost and XGBoost
- 7. Unsupervised Learning**
- a. Principal Component Analysis
 - b. Clustering
- 8. Reinforcement Learning**
- a. Markov decision Processes
 - b. Deep Reinforcement Learning
 - c. Inverse Reinforcement Learning
- 9. Deep Learning**
- a. The mathematics of deep learning
 - i. Mathematical definition
 - ii. Optimization
 - iii. Drop out
 - b. Feedforward Neural Networks
 - c. Recurrent Neural Networks
 - d. Long Short Term Memory Networks
 - e. Convolutional Neural Networks
 - f. Interpretability
- 10. Artificial Intelligence**
- a. Natural Language Processing
 - i. Theory
 - ii. Applications
- 11. Modern Financial Modeling**
- a. Putting together Traditional and new models
- 12. Implementing Machine Learning Models in Python**
- a. Basics of Python
 - b. Review of Machine Learning in Finance Code

Instructor's Short Biography - Miquel Noguer I Alonso PhD

Miquel Noguer i Alonso is a financial markets practitioner with more than 20 years of experience in asset management, he is currently Head of Development at Global AI (Big Data Artificial Intelligence in Finance company) and Head on Innovation and Technology at IEF.

He worked for UBS AG (Switzerland) as Executive Director. He was member of European Investment Committee for the last 10 years. He worked as a Chief Investment Office and CIO for Andbank from 2000 to 2006. He started his career at KPMG.

He is Adjunct Professor at Columbia University teaching Asset Allocation, Big Data in Finance and Fintech. He is also Professor at ESADE teaching Hedge Fund, Big Data in Finance and Fintech. He is a member of the CQF faculty.

He received an MBA and a Degree in business administration and economics in ESADE in 1993. In 2010 he earned a PhD in quantitative finance with a Summa Cum Laude distinction (UNED – Madrid Spain). He completed a Postdoc in Columbia Business School in 2012. He holds the ARPM certificate.