# Advanced Machine Learning for Finance: Classification Techniques

***Follow on course to Introduction to Data Science for Finance***

## Overview

This hands-on data science course is a sequel to Cognitir's Introduction to Data Science for Finance workshop and caters to a business and finance professionals audience. Advanced Classification will provide an overview of modern machine learning algorithms that analysts, portfolio managers, traders and chief investment officers should understand and in a context that goes beyond a broader level introductory class in data science. Classification methods are touched upon in the introduction course but the Advanced Classification workshop focuses exclusively on this highly demanded and rapidly adopted segment of data science and machine learning

This course will explore advanced classification methods including neural networks and decision trees which are among the most effective data science techniques. This workshop also provides an introduction to deep learning, a technique which has significantly increased the performance of machine learning algorithms over the last years and is heavily used in the financial services industry. Deep learning utilizes algorithms and methods that perform in a similar manner to the human brain. According to Gartner, 80% of data scientists will be competent in deep learning and deep learning will be utilized in a much larger role in different forms of predictive analytics across all functional areas of business including finance and capital markets.

At the end of the workshop, participants will be comfortable applying the Python programming language to build common classification algorithms and evaluate & interpret their accuracies in the context of the financial world.

## What This Course Offers and Its Goals

- An overview and specific focus on core classification methods and how to use them to solve real-world problems in the finance industry
- Aims to provide the students with a high level understanding and working knowledge of highly coveted artificial intelligence areas including deep learning and neural networks and their direct application to the field of financial analysis and capital markets
- Provide course students that work in the finance industry with the ability to evaluate and select from a variety of classification methods and tools as these techniques continue to be adapted and implemented at an ever increasing rate

- Further and more advanced hands-on Python programming experience beyond the introduction course
- Course notes, certificate of completion, and post-seminar email support for 3 months
- An engaging and practical training approach with a qualified instructor with relevant technical, business, and educational experiences

## Who Is This For?

This course is relevant for individuals working with or needing to understand machine-learning algorithms, specifically classification methods.

**Cognitir's *Introduction to Data Science for Finance* course or the equivalent is required.**

## Course and Contact Information

Course Prerequisites: *Introduction to Data Science* is a prerequisite. If you have not been able to take this course with us yet, please contact us.

Info@cognitir.com
+1 908 505 5991 (US); +44 75 0686 49 85 (UK)
www.cognitir.com

## Course Curriculum

- **Review of Core Data Science Methods**
  - Supervised vs. Unsupervised learning, Classification, Regression, Clustering, Dimensionality Reduction, Ensemble, etc.
- **Selecting Informative Attributes**
  - Information gain, entropy, overfitting/generalization
- **Decision Trees & Random Forests**
  - What are they?
  - How to do this in Python
  - Coding Challenge
- **K-Nearest Neighbors**
  - What is it?
  - How to do this in Python
  - K-Nearest Neighbors Coding Challenge
- **Support Vector Machines**
  - What are they?
  - How to do this in Python
  - SVM Coding Challenge
- **Neural Networks**
  - What are they?
  - How to use this in Python with an example

    - Neural Nets Coding Challenge
- **Deep Learning**
    - Why the hype?
    - How to get started with deep learning
- **Evaluation of Classification Methods**
    - Accuracy, confusion matrix, ROC, AUC, Precision, Recall, etc.
- **Final Project**
    - Given a dataset and a classification mandate, students have to run these different classification models and figure out which one is “best”

## Course Content Developers

### David Haber

david@cognitir.com
David heads Cognitir's products and technology. He has led programming workshops at the undergraduate and graduate levels, at blue chip companies, and world renowned management consulting firms.

David has experience working with both startups and large corporations. Previously, he was a lead software and machine learning engineer at Soma Analytics, an investor-backed and award-winning health-tech startup in London. David also worked on optimizing large-scale payment processing systems at Deutsche Bank in Singapore. Outside of Cognitir, he currently advises HiDoc, an early stage digital health startup in Germany.

David holds an MEng (First-Class Honours) in Computer Science from Imperial College London (UK) where he focused on statistical machine learning. He presented his work at international conferences and won several awards for his work. During his studies, he also served as a teaching assistant at Imperial College where he helped undergraduate students master fundamental computer science concepts.

### Neal Kumar

neal@cognitir.com
At Cognitir, Neal leads strategy and business development initiatives and advises on new product development.

Outside of Cognitir, Neal consults C-level teams and senior business managers on a variety of strategic topics ranging from M&A to marketing. He also leads training seminars for Wall Street Prep and has consistently received top reviews from attendees and created two training courses that were used in seminars worldwide. Before his consulting and training careers, Neal taught secondary mathematics in St. Louis Public Schools (USA) as a Teach for America Corps Member. Prior to joining Teach For America, Neal worked in investment banking at JPMorgan and Houlihan Lokey.

Neal received his MBA from London Business School (UK) and BBA in Finance from the University of Notre Dame (USA). He is also a CFA Charterholder and a Member of the CFA Institute Education Advisory Committee (EAC) Working Body where he helps shape CFA Program Content.