ML in Finance - Shaastra Trainer

Centre For Innovation

ML in Finance

Finance is quintessential to the fast-paced world we live in today. Using machine learning principles in finance allows investors to make informed and consistently good decisions and hence reduce volatility in the markets.

Abstract

Throughout this workshop we will be delving into topics ranging from basics of markets to algorithmic techniques used in trading today. The sessions will include a mixture of theoretical and practical applications as we evolve various financial models to aid us in analyzing real world market data.

Duration

2 sessions : 3 hours each

Session 1	Machine learning basics (quick overview of relevant concepts), Market basics, Linear models, Additive models, Ensemble models.
Session 2	Neural networks (basics), CNNs, Neural Network models (LSTM, conv LSTM),

Pre-requisites

Basic probability and matrices. Basic understanding of elementary python syntax would be helpful.

Detailed Plan

The whole workshop will span for 2 days and consist of 2 sessions with x modules in total

Session 1

Module 1 : Basics of ML

- Regression
- Classification
- Bagging and Boosting

Module 2 : Market Basics

- The Stock Market – break the jargon
- Investment techniques, credit risk

Module 3 : Linear Models

- Reading time series data as input
- SVM (Stock price prediction)
- ANN (credit risk evaluation)
- Implementation

Module 4 : Additive Models

- Classification models using decision trees
- Boosted Classification Trees
- Implementation

Module 5 : Ensemble Models

- Random Forest
- XGBoost(Xtreme Gradient Boosting)
- Customer behavior analysis using RF

Session 2

Module 6 : Neural Networks

- Neurons, layers, activations
- Forward pass and back propagation

Module 7 : CNNs

- Overview of convolution
- Understanding of CNNs
- Application in cryptocurrency price estimation

Module 8 : LSTMs

- Introduction to LSTMs and conv LSTMs
- Automated stock prediction using LSTMs (full demo with **simulation**)