

# Financial Machine Learning

## Books

- ★ Marcos López de Prado - Advances in Financial Machine Learning [\[Link\]](#).
- ★ Dr Howard B Bandy - Quantitative Technical Analysis: An integrated approach to trading system development and trading management [\[Link\]](#)
- Tony Guida - Big Data and Machine Learning in Quantitative Investment [\[Link\]](#)
- ★ Michael Halls-Moore - Advanced Algorithmic Trading [\[Link\]](#)
- Jannes Klaas - Machine Learning for Finance: Data algorithms for the markets and deep learning from the ground up for financial experts and economics [\[Link\]](#)
- Stefan Jansen - Hands-On Machine Learning for Algorithmic Trading: Design and implement smart investment strategies to analyze market behavior using the Python ecosystem [\[Link\]](#)
- Ali N. Akansu et al. - Financial Signal Processing and Machine Learning [\[Link\]](#)
- David Aronson - Evidence-Based Technical Analysis: Applying the Scientific Method and Statistical Inference to Trading [\[Link\]](#)
- David Aronson - Statistically Sound Machine Learning for Algorithmic Trading of Financial Instruments [\[Link\]](#)
- Ernest P. Chan - Machine Trading: Deploying Computer Algorithms to Conquer the Markets [\[Link\]](#)

## Online series and courses

The selection of online courses for ML for trading is very poor in my opinion.

- Udacity, Georgia Tech - Machine Learning for Trading [\[Link\]](#)
- Udacity, WorldQuant - Artificial Intelligence for Trading [\[Link\]](#)
- Coursera, NYU - Machine Learning and Reinforcement Learning in Finance Specialization (Weakly related to trading)
  - Coursera, NYU - Guided Tour of Machine Learning in Finance [\[Link\]](#)
  - Coursera, NYU - Fundamentals of Machine Learning in Finance [\[Link\]](#)
  - Coursera, NYU - Reinforcement Learning in Finance [\[Link\]](#)
  - Coursera, NYU - Overview of Advanced Methods for Reinforcement Learning in Finance [\[Link\]](#)

## Youtube videos

- ★ Siraj Raval - Videos about stock market prediction using Deep Learning [\[Link\]](#)
- QuantInsti Youtube - webinars about Machine Learning for trading [\[Link\]](#)
- ★ Quantopian - Webinars about Machine Learning for trading [\[Link\]](#)
- Sentdex - Machine Learning for Forex and Stock analysis and algorithmic trading [\[Link\]](#)

- Sentdex - Python programming for Finance (a few videos including Machine Learning) [\[Link\]](#)
- QuantNews - Machine Learning for Algorithmic Trading 3 part series [\[Link\]](#)
- ★ Howard Bandy - Machine Learning Trading System Development Webinar [\[Link\]](#)
- Ernie Chan - Machine Learning for Quantitative Trading Webinar [\[Link\]](#)
- Hitoshi Harada, CTO at Alpaca - Deep Learning in Finance Talk [\[Link\]](#)
- Prediction Machines - Deep Learning with Python in Finance Talk [\[Link\]](#)
- Master Thesis presentation, Uni of Essex - Analyzing the Limit Order Book, A Deep Learning Approach [\[Link\]](#)
- Tucker Balch - Applying Deep Reinforcement Learning to Trading [\[Link\]](#)
- Krish Naik - Machine learning tutorials and their Application in Stock Prediction [\[Link\]](#)

## Blogs and content websites

- ★ Quantstart - Machine Learning for Trading articles [\[Link\]](#)
- ★ Quantopian - Lecture notebooks on ML-related statistics [\[Link\]](#)
- ★ Quantopian - Tutorials and notebooks tagged with Machine Learning [\[Link\]](#)
- Synthical, an AI-powered collaborative environment for Research [\[Link\]](#)
- AAA Quants, Tom Starke Blog [\[Link\]](#)
- RobotWealth, Kris Longmore Blog [\[Link\]](#)
- Quantsportal, Jacques Joubert's Blog [\[Link\]](#)
- Blackarbs blog [\[Link\]](#)
- Hardikp, Hardik Patel blog [\[Link\]](#)

## Interviews

- ★ Chat with Traders EP042 - Machine learning for algorithmic trading with Bert Mouler [\[Link\]](#)
- ★ Chat with Traders EP142 - Algo trader using automation to bypass human flaws with Bert Mouler [\[Link\]](#)
- Chat with Traders EP147 - Detective work leading to viable trading strategies with Tom Starke [\[Link\]](#)
- ★ Chat with Traders Quantopian 5 - Good Uses of Machine Learning in Finance with Max Margenot [\[Link\]](#)
- Chat With Traders EP131 - Trading strategies, powered by machine learning with Morgan Slade [\[Link\]](#)
- Better System Trader EP023 - Portfolio manager Michael Himmel talks AI and machine learning in trading [\[Link\]](#)
- ★ Better System Trader EP028 - David Aronson shares research into indicators that identify Bull and Bear markets. [\[Link\]](#)
- Better System Trader EP082 - Machine Learning With Kris Longmore [\[Link\]](#)
- ★ Better System Trader EP064 - Cryptocurrencies and Machine Learning with Bert Mouler [\[Link\]](#)
- Better System Trader EP090 - This quants' approach to designing algo strategies with Michael Halls-Moore [\[Link\]](#)

# Papers

- ★ James Cumming - An Investigation into the Use of Reinforcement Learning Techniques within the Algorithmic Trading Domain [\[Link\]](#)
- ★ Marcos López de Prado - The 10 reasons most Machine Learning Funds fails [\[Link\]](#)
- Zhuoran Xiong et al. - Practical Deep Reinforcement Learning Approach for Stock Trading [\[Link\]](#)
- Gordon Ritter - Machine Learning for Trading [\[Link\]](#)
- J.B. Heaton et al. - Deep Learning for Finance: Deep Portfolios [\[Link\]](#)
- Justin Sirignano et al. - Universal Features of Price Formation in Financial Markets: Perspectives From Deep Learning [\[Link\]](#)
- Marcial Messmer - Deep Learning and the Cross-Section of Expected Returns [\[Link\]](#)
- ★ Marcos Lopez de Prado - Ten Financial Applications of Machine Learning (Presentation Slides) [\[Link\]](#)
- ★ Marcos Lopez de Prado - The Myth and Reality of Financial Machine Learning (Presentation Slides) [\[Link\]](#)
- Artur Sepp - Machine Learning for Volatility Trading (Presentation Slides) [\[Link\]](#)
- Marcos Lopez de Prado - Market Microstructure in the Age of Machine Learning [\[Link\]](#)
- Jonathan Brogaard - Machine Learning and the Stock Market [\[Link\]](#)
- Xinyao Qian - Financial Series Prediction: Comparison Between Precision of Time Series Models and Machine Learning Methods [\[Link\]](#)
- Milan Fičura - Forecasting Foreign Exchange Rate Movements with k-Nearest-Neighbour, Ridge Regression and Feed-Forward Neural Networks [\[Link\]](#)
- Samuel Edet - Recurrent Neural Networks in Forecasting S&P 500 Index [\[Link\]](#)
- Amin Hedayati et al. - Stock Market Index Prediction Using Artificial Neural Network [\[Link\]](#)
- Jaydip Sen et al. - A Robust Predictive Model for Stock Price Forecasting [\[Link\]](#)
- O.B. Sezer et al. - An Artificial Neural Network-based Stock Trading System Using Technical Analysis and Big Data Framework [\[Link\]](#)
- Ritika Singh et al. - Stock prediction using deep learning [\[Link\]](#)
- Thomas Fischera et al. - Deep learning with long short-term memory networks for financial market predictions [\[Link\]](#)
- R.C.Cavalcante et al. - Computational Intelligence and Financial Markets: A Survey and Future Directions [\[Link\]](#)
- E. Chong et al. - Deep Learning Networks for Stock Market Analysis and Prediction: Methodology, Data Representations, and Case Studies [\[Link\]](#)
- Chien Yi Huang - Financial Trading as a Game: A Deep Reinforcement Learning Approach [\[Link\]](#)
- W. Bao et al. - A deep learning framework for financial time series using stacked autoencoders and longshort term memory [\[Link\]](#)
- Xingyu Zhou et al. - Stock Market Prediction on High-Frequency Data Using Generative Adversarial Nets [\[Link\]](#)
- Fuli Feng et al. - Improving Stock Movement Prediction with Adversarial Training [\[Link\]](#)

- Z. Zhao et al. - Time-Weighted LSTM Model with Redefined Labeling for Stock Trend Prediction [\[Link\]](#)
- Arthur le Calvez, Dave Cliff - Deep Learning can Replicate Adaptive Traders in a Limit-Order-Book Financial Market [\[Link\]](#)
- Dang Lien Minh et al. - Deep Learning Approach for Short-Term Stock Trends Prediction Based on Two-Stream Gated Recurrent Unit Network [\[Link\]](#)
- Yue Deng et al. - Deep Direct Reinforcement Learning for Financial Signal Representation and Trading [\[Link\]](#)
- Xiao Zhong - A comprehensive cluster and classification mining procedure for daily stock market return forecasting [\[Link\]](#)
- J. Zhang et al. - A novel data-driven stock price trend prediction system [\[Link\]](#)
- Ehsan Hoseinzade et al. - CNNPred: CNN-based stock market prediction using several data sources [\[Link\]](#)
- Hyejung Chung et al. - Genetic Algorithm-Optimized Long Short-Term Memory Network for Stock Market Prediction [\[Link\]](#)
- Yujin Baek et al. - ModAugNet: A new forecasting framework for stock market index value with an overfitting prevention LSTM module and a prediction LSTM module [\[Link\]](#)
- Rajashree Dash et al. - A hybrid stock trading framework integrating technical analysis with machine learning techniques [\[Link\]](#)
- E.A. Gerlein et al. - Evaluating machine learning classification for financial trading: an empirical approach [\[Link\]](#)
- Justin Sirignano - Deep Learning for Limit Order Books [\[Link\]](#)

## Events & Sentiment trading

- Frank Z. Xing et al. - Natural language based financial forecasting: a survey [\[Link\]](#)
- Ziniu Hu et al. - Listening to Chaotic Whispers: A Deep Learning Framework for News-oriented Stock Trend Prediction [\[Link\]](#)
- J.W. Leung, Master Thesis, MIT - Application of Machine Learning: Automated Trading Informed by Event Driven Data [\[Link\]](#)
- Xiao Ding et al. - Deep Learning for Event-Driven Stock Prediction [\[Link\]](#)

## Reinforcement Learning environments

- ★ TradingGym [\[Link\]](#)
- Trading-Gym [\[Link\]](#)
- btym [\[Link\]](#)
- TradzQAI [\[Link\]](#)

## Code

- QTradeX - A powerful and flexible Python framework for designing, backtesting, optimizing, and deploying algotrading bots [\[Link\]](#)
- marketneutral - pairs trading with ML [\[Link\]](#)
- BlackArbsCEO - Advances in Financial Machine Learning Exercises [\[Link\]](#)

- mlfinlab - Package for Advances in Financial Machine Learning [\[Link\]](#)
- MachineLearningStocks - Using python and scikit-learn to make stock predictions [\[Link\]](#)
- AlphaAI - Use unsupervised and supervised learning to predict stocks [\[Link\]](#)
- SGX-Full-OrderBook-Tick-Data-Trading-Strategy - Providing the solutions for high-frequency trading (HFT) strategies using ML [\[Link\]](#)
- NeuralNetworkStocks - Using Python and keras to make stock predictions [\[Link\]](#)
- Stock-Price-Prediction-LSTM - OHLC Average Prediction of Apple Inc. Using LSTM Recurrent Neural Network [\[Link\]](#)
- SravB - Algorithmic trading using machine learning [\[Link\]](#)
- Flow - High frequency AI based algorithmic trading module [\[Link\]](#)
- timestampcome - Test-stock-prediction-algorithms [\[Link\]](#)
- deepstock - Technical experimentations to beat the stock market using deep learning [\[Link\]](#)
- qtrader - Reinforcement Learning for Portfolio Management [\[Link\]](#)
- stockPredictor - Predict stock movement with Machine Learning and Deep Learning algorithms [\[Link\]](#)
- stock\_market\_reinforcement\_learning - Stock market environment using OpenGym with Deep Q-learning and Policy Gradient [\[Link\]](#)
- deep-algotrading - deep learning techniques from regression to LSTM using financial data [\[Link\]](#)
- deep\_trader - Use reinforcement learning on stock market and agent tries to learn trading [\[Link\]](#)
- Deep-Trading - Algorithmic trading with deep learning experiments [\[Link\]](#)
- Deep-Trading - Algorithmic Trading using RNN [\[Link\]](#)
- Multidimensional-LSTM-BitCoin-Time-Series - Using multidimensional LSTM neural networks to create a forecast for Bitcoin price [\[Link\]](#)
- QLearning\_Trading - Learning to trade under the reinforcement learning framework [\[Link\]](#)
- Day-Trading-Application - Use deep learning to make accurate future stock return predictions [\[Link\]](#)
- bulbea - Deep Learning based Python Library for Stock Market Prediction and Modelling [\[Link\]](#)
- PGPortfolio - source code of "A Deep Reinforcement Learning Framework for the Financial Portfolio Management Problem" [\[Link\]](#)
- Thesis - Reinforcement Learning for Automated Trading [\[Link\]](#)
- DQN - Reinforcement Learning for finance [\[Link\]](#)
- Deep-Trading-Agent - Deep Reinforcement Learning based Trading Agent for Bitcoin [\[Link\]](#)
- deep\_portfolio - Use Reinforcement Learning and Supervised learning to Optimize portfolio allocation [\[Link\]](#)
- Deep-Reinforcement-Learning-in-Stock-Trading - Using deep actor-critic model to learn best strategies in pair trading [\[Link\]](#)
- Stock-Price-Prediction-LSTM - OHLC Average Prediction of Apple Inc. Using LSTM Recurrent Neural Network [\[Link\]](#)