

AI Finance

Friday CHI_MAC
2014 ~ present
Junho Song

<https://www.facebook.com/groups/1707727306150009/>

2015 ~

| | | |
|------------|--|---|
| 교재 (Hull) | 선물 옵션 투자의 이론과 전략 - http://www.aladin.co.kr/shcp/wproduct.aspx?ItemId=16101103 | |
| 교재 (TimeR) | Time Series Analysis: With Applications in R - http://www.amazon.co.uk/Time-Analysis-App | |
| 교재 (DMA) | Algorithmic Trading and DMA: An introduction to direct access trading strategies - http://www | |
| 교재(QTA) | Quantitative Technical Analysis: An integrated approach to trading system development an | |
| 교재(FinPy) | Mastering pandas for Finance - http://www.amazon.com/Mastering-pandas-Finance-Micha | |
| 교재(MLT) | Machine Learning for Trading : https://www.udacity.com/course/machine-learning-for-tradin | |
| 회차 | 일시 | 내용 |
| 1 | 2015-10-16 | (Hull) 1.서론 |
| | | (DMA) 1.Overview |
| | | (FinPy) 1.Getting Started with pandas Using Wakarl.io |
| 2 | 2015-10-23 | (Hull) 2.선물시장의 구조와 운영 |
| | | (DMA) 2.Market microstructure |
| | | (TimeR) 1.Introduction |
| 3 | 2015-10-30 | (Hull) 3.선물을 이용한 헷징전략 |
| | | (QTA) 1. Introduction |
| | | (FinPy) 2.Introducing the Series and DataFrame |
| 4 | 2015-11-06 | (Hull) 4.이자율 |
| | | (QTA) 2.Risk and Risk Tolerance |
| | | (TimeR) 2.Fundamental Concepts |
| 5 | 2015-11-13 | (QTA) 3.Programming Environments & 4.Data |
| | | (FinPy) 3.Reshaping, Reorganizing, and Aggregating |
| 6 | 2015-11-20 | (Hull) 5.선도가격과 선물가격의 결정 |
| | | (QTA) 4.Data |
| | | (QTA) 5.Issue Selection (1) |
| 7 | 2015-12-04 | (QTA) 6.Model Development - Preliminaries |
| | | (FinPy) 4.Time-series |
| | | (놀라운손님) (금융투자사 기계학습 적용을 위한) measurement |
| 8 | 2015-12-11 | (Hull) 6.금리선물 |
| | | (QTA) 5.Issue Selection (2) |
| | | (QTA) 7.Model Development - Indicator-Based |
| | | (TimeR) 3.Trends |
| 9 | 2015-12-18 | (놀라운특강) 계좌개설 및 모의투자 시작해보기 (키움증권) |
| | | (놀라운특강) 금융 API 연동 및 소개(키움증권) |
| 10 | 2016-01-08 | (놀라운특강) 딥러닝(RNN) 기초 (1/2) |
| | | (QTA) 8.Model Development - Machine Learning 1/2 |
| | | (FinPy) 5.Time-series Stock Data |
| | | (놀라운특강) Open API 사용법(1/2) |
| 11 | 2016-01-15 | (놀라운특강) MCMC (1/2) |
| 12 | 2016-01-22 | (금융데이터분석) pandas-datereader 패키지 사용법 + @ |

2016 ~

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|-----------------------------------|--|--|--|---|
| Q-learning with Neural Networks | http://outlace.com/Reinforcement-Learning-Part-3/ | | | |
| Book - Python Machine Learning | https://github.com/jasour/python-machine-learning-book | | | |
| Book - Mastering Python for Finan | https://github.com/jamesmawm/Mastering-Python-for-Finance-source-codes | | | |
| Book - Finacial Time Series | http://as.wiley.com/WileyCDA/WileyTitle/productCd-EHEP002380.html | | | |
| | | | | |
| 4/29/2016 | (Quantopian) Basic and Backtesting (모두Deep) 개요 및 Regression (특강) Machine Learning for Trading - project review 1 | | | Quantopian - Tutorial Lecture 1 Introduction to ResearchA simple tutorial to help you get up to speed in the research environment. Lecture 2 Linear RegressionAn explanation of the technique and implementation in Python. Lecture 3 Multiple Linear RegressionExpanding from one to many variables. Lecture 4 Linear Correlation AnalysisA basic primer on correlation and how it relates to variance. Lecture 5 Random VariablesTheory and sample use cases. Lecture 6 Skewness and KurtosisWays to think about distributions. Lecture 7 Confidence IntervalsA primer in collaboration with Jeremiah Johnson at UNH. Lecture 8 Maximum Likelihood EstimationA basic intro developed in collaboration with Andrei Kirilenko at MIT Sloan. Lecture 9 Spearman Rank CorrelationWhat to do when the relationship in your data is not necessarily linear. Lecture 10 Beta HedgingHow to hedge your algorithm against risk factors. Lecture 11 Introduction to Pairs TradingA complete workflow to building a basic pairs trading strategy on Quantopian. Lecture 12 Position Concentration RiskWhy investing in few assets is very risky. Lecture 13 The Dangers of OverfittingHow overfitting can trick you into thinking your algorithm is good. Lecture 14 Instability of EstimatesHow estimates can lie and ways to deal with that. Lecture 15 Model MisspecificationViolation of assumptions can cause a model to falsely look good. Lecture 16 Violations of Regression ModelsWhat happens when regression assumptions are violated. Lecture 17 Regression Model InstabilityWhy your regression coefficients can change. Lecture 18 Arbitrage Pricing TheoryHow factor models can be used to predict returns. Lecture 19 Fundamental Factor ModelsHow fundamental data can be used in factor models. Lecture 20 Factor Risk ExposureEstimating exposure to risk factors using factor models. Lecture 21 Long-Short EquityAn overview of the long-short equity strategy and how it can be used. Lecture 22 Ranking Universes by FactorsHow to rank universes of assets and evaluate ranking systems. Lecture 23 Momentum StrategiesA broad overview of momentum strategies and their rationale. Lecture 24 Measuring MomentumAn introduction to how one might measure momentum quantitatively. Lecture 25 ARCH, GARCH, and GMMAPrimer on volatility forecasting models developed with Andrei Kirilenko. Lecture 26 Kalman FiltersHow to use Kalman filters to get a good signal out of noisy data. |
| 5/6/2016 | | | | |
| 5/13/2016 | (Q-Learning) Introduction, What is Q-learning? (모두Deep) Logistic 과 딥러닝 기본개념 및 구현코드 review (논문특감) ICLR 컨퍼런스 현장 스케치 | | | |
| 5/20/2016 | (Quantopian) Beta HedgingHow to hedge your algorithm against risk factors (모두Deep) 딥러닝 Overfitting과 Neural Network (Q-Learning) Neural Network as our Q function, Online Training, Playing | | | |
| 5/27/2016 | (Quantopian) Spearman Rank Correlation & Beta Hedging (모두Deep) Neural Network 이론 및 TensorFlow code review (Q-Learning) Demo, Conclusion | | | |
| 6/3/2016 | (Quantopian) Pairs Trading & Position Concentration Risk (모두Deep) Neural Network 이론 및 TensorFlow code review | | | |
| 6/10/2016 | (Quantopian) Position Concentration Risk & The Dangers of Overfitting (Python Machine Learning) A Tour of Machine Learning Classifiers Using Scikit-Learn | | | |

2016 ~

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|-----------|---|---|
| 7/15/2016 | (Stanford cs231n) Lec4 Training Neural Networks | Lecture 11 Beta Hedging - How to hedge your algorithm against risk factors. |
| | (Python Machine Learning) Building Good Training Sets - Data Pre-Processing | Lecture 12 Introduction to Pairs Trading - A complete workflow to building a basic pairs tra |
| | (놀러온특강) AlphaTrade: 어느 평범한 개발자의 주식 투기(?) 이야기 | Lecture 13 Position Concentration Risk - Why investing in few assets is very risky. |
| | | * Lecture 14 Autocorrelation and AR Models - Autocorrelation and how to model it to reduc |
| 7/22/2016 | (Quantopian) Integration, Cointegration and Stationarity | Lecture 15 The Dangers of Overfitting - How overfitting can trick you into thinking your alge |
| | (TensorFlow) First Contact With TF - 1 ~ 2장 | Lecture 16 Instability of Estimates - How estimates can lie and ways to deal with that. |
| | (Python Machine Learning) 5장 Compressing Data via Dimensionality Reduction | Lecture 17 Model Misspecification - Violation of assumptions can cause a model to falsely loo |
| | | Lecture 18 Violations of Regression Models - What happens when regression assumptions are |
| 7/29/2016 | (Quantopian) Arbitrage Pricing Theory | Lecture 19 Regression Model Instability - Why your regression coefficients can change. |
| | (TensorFlow) First Contact With TF - 3장 | * Lecture 20 Integration, Cointegration, and Stationarity - How non stationarity can break tr |
| | (Stanford cs231n)5장 Training NN and Hyperparameter optimization | Lecture 21 Arbitrage Pricing Theory - How factor models can be used to predict returns. |
| | | Lecture 22 Fundamental Factor Models - How fundamental data can be used in factor models. |
| 8/5/2016 | (Quantopian) Fundamental Factor Models | Lecture 23 Factor Risk Exposure - Estimating exposure to risk factors using factor models. |
| | (Stanford cs231n)6장 Parameter Update | Lecture 24 Long-Short Equity - An overview of the long-short equity strategy and how it can be us |
| | (TensorFlow) First Contact With TF - 4장 | Lecture 25 Ranking Universes by Factors - How to rank universes of assets and evaluate ranking sy |
| | | Lecture 26 Momentum Strategies - A broad overview of momentum strategies and their rationale. |
| 8/12/2016 | (Python Machine Learning) 6. Learning Best Practices for Model Evaluation and Hyperparameter | Lecture 27 Measuring Momentum - An introduction to how one might measure momentum quantiti |
| | (Stanford cs231n) ConvNets for spatial localization Object detection | Lecture 28 ARCH, GARCH, and GMM - A primer on volatility forecasting models developed with |
| | (TensorFlow) First Contact With TF - 5장 | Lecture 29 Kalman Filters - How to use Kalman filters to get a good signal out of noisy data. |
| | | |
| 8/19/2016 | (5MFinance) Commodities : Cross Hedging, Crude Oil markets | 5MFinance |
| | (Python Machine Learning) 7. Combining Different Models for Ensemble Learning | Commodities |
| | (TensorFlow) First Contact With TF - 6장 | Cross Hedging |
| | (Stanford cs231n) Lecture 9.Understanding and Visualizing Convolutional Neural Networks | Crude Oil Markets |
| | | Corporate Finance |
| 8/26/2016 | (Python Machine Learning) 7. Combining Different Models for Ensemble Learning(1/2) | Many of the presentations below are works-in-progress. Fee |
| | (놀러온 특강) 채권투자 전략과 기계학습을 이용한 금융상품 | Intro to Financial Statements |
| | | Financial Ratios |
| 9/2/2016 | (Stanford cs231n) 10장 Recurrent Neural Networks (RNN), Long Short Term Memory (LSTM) | Intro to Stock Investments |
| | (Python Machine Learning) 7. Combining Different Models for Ensemble Learning(2/2) | Intro to Bond Valuation |
| | | The CAPM |
| 9/9/2016 | (5MFinance) Financial Statements | OCFs |
| | (Quantopian) Lecture 23 Factor Risk Exposure - Estimating exposure to risk factors using factor models. | TVM Single CFs |
| | (놀러온특강) 시스템 트레이딩 노하우 | Operating Cash Flow |

2017 ~

[Google Cloud]

<https://www.youtube.com/playlist?list=PLlivdWYyY5sqI8RuUibH5sMb1Exlw0IAR>

[논문초록+Tensorflow code review]

tensorflow-101 <https://github.com/sjchoi86/Tensorflow-101>
논문초록

목차

1. Web crawling
10. TensorBoard
11. Semantic segmentation

[cs20si Tensorflow for Deep Learning Research] 목차

<http://web.stanford.edu/class/cs20si/syllabus.html>

Jan 11
Week 1

No class

Set up Tensorflow
Suggested Readings:
Nothing in particular, but you're welcome to read anything

Lecture

Jan 13

Overview of Tensorflow
Why Tensorflow?
Graphs and Sessions

[퀀트 접근]

Book - Python for Finance

목차

1. Why Python
2. Infrastructure
17. Derivative
18. Portfolio Value
19. Volatility Calculation

<https://github.com/chiphuyen/lf-stanford-tutorials>

To do

Jan 13

Check out TensorBoard

Lecture

Jan 18
Week 2

Operations
Basic operations, constants, variables
Control dependencies
Feeding inputs
TensorBoard

[머신러닝+파이썬]

Bayesian Reasoning and Machine Learning

목차

- probability reparameterization
- basic graph coloring
- Belief network

Workshop

Jan 20

Linear and Logistic Regression
Tensorflow's Optimizers
Example: OCR task on MNIST dataset

A1 released

Jan 20

Assignment #1 released

Lecture

Jan 25
Week 3

Structure your TensorFlow model
Example: word2vec

[GAN 뽀개기]

GAN 이론 및 구현

[Vanilla GAN](#)

[Conditional GAN](#)

[InfoGAN](#)

[Wasserstein GAN](#)

[DualGAN](#)

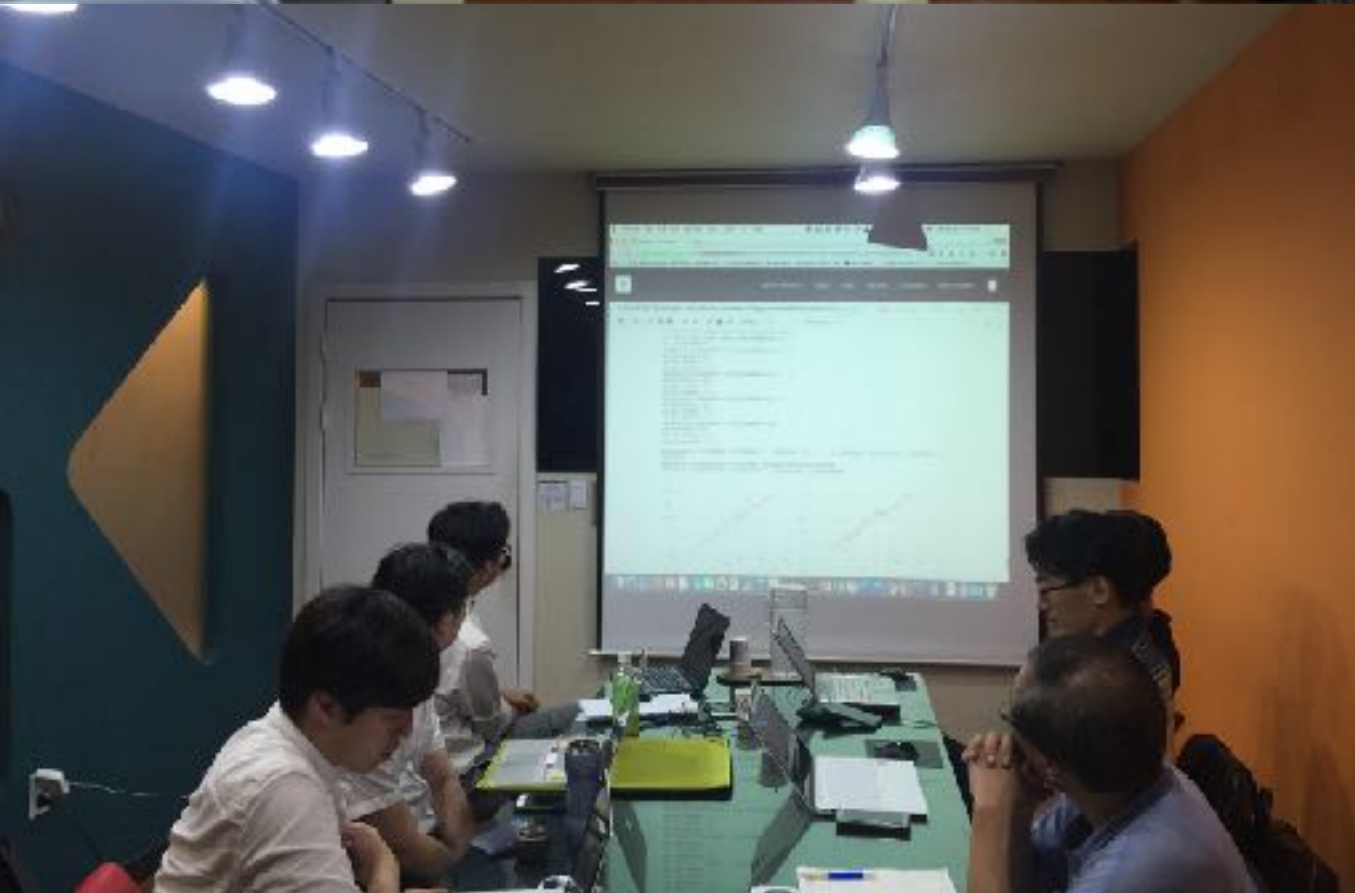
[Adversarial Autoencoder](#)

[Adversarial Variational Bayes](#)

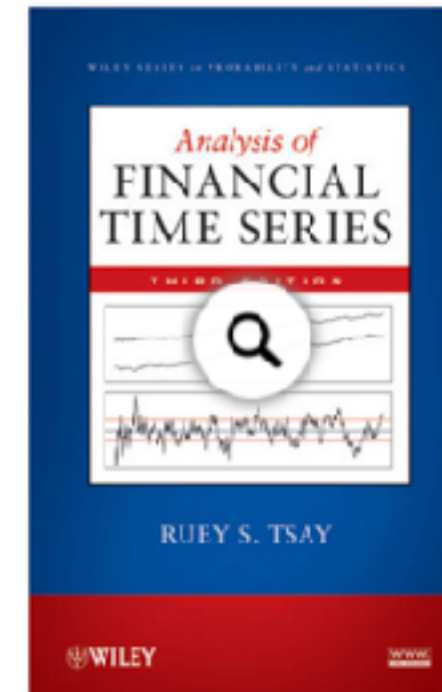
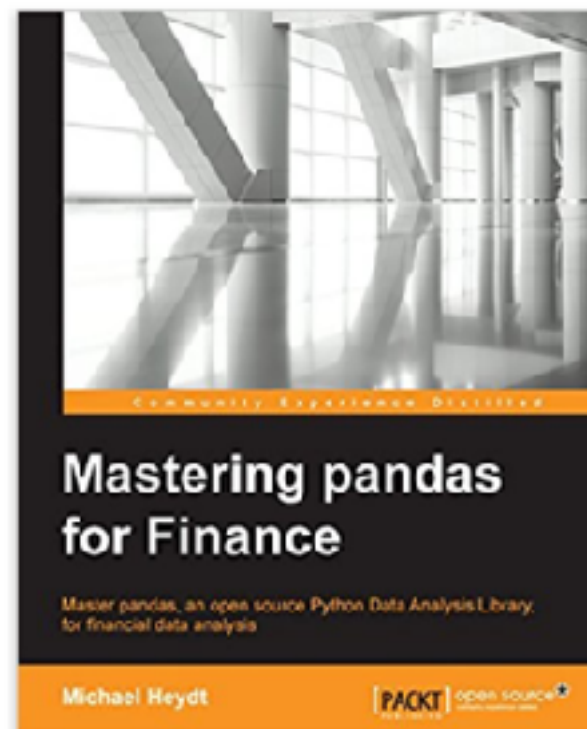
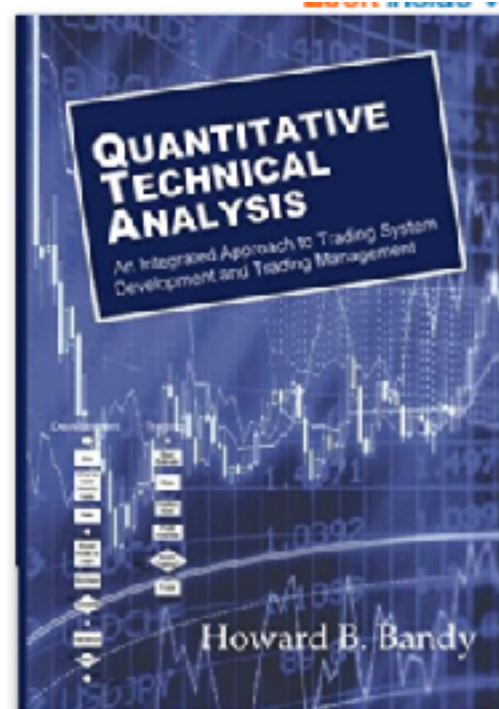
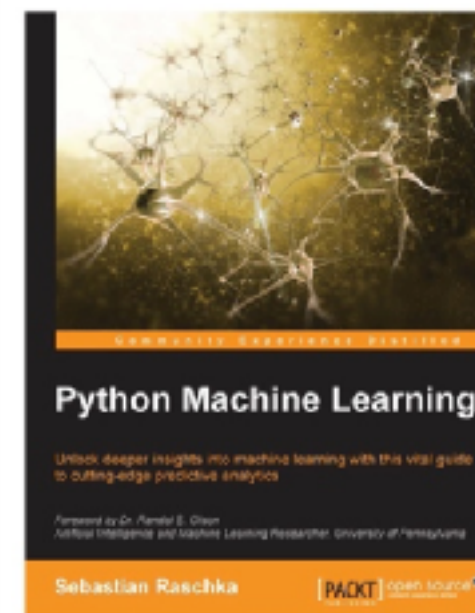
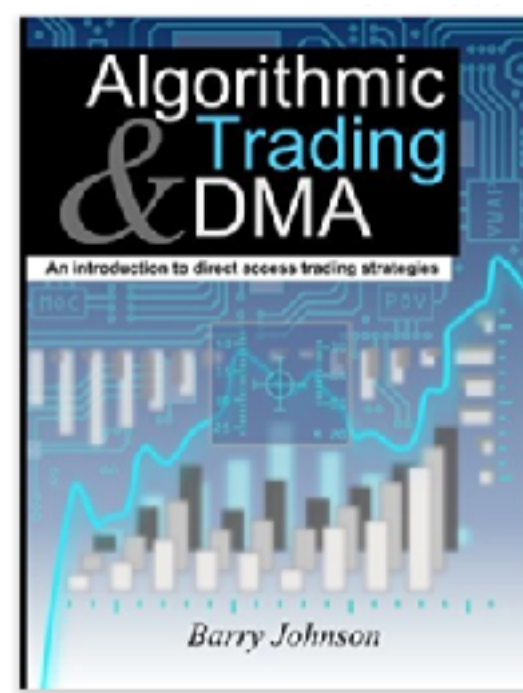
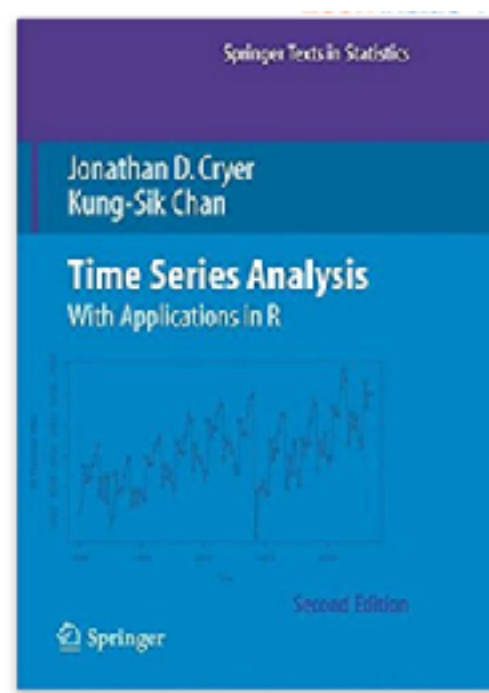
[Apache Spark]

edx - Introduction to Apache Spark + Big Data Analysis with Apache Spark)

목차







FREE COURSE

Deep Learning
by Google

Take machine learning to the next level

START FREE COURSE

FREE COURSE

Machine Learning for
Tradingby Georgia
Tech

Offered at Georgia Tech as CS 7646

NANODEGREE PROGRAM

Machine Learning Engineer
by kaggle

Make Predictive Models



Lectures

| | | |
|------------|---------------------------------|---|
| Lecture 1 | Introduction to Research | A simple tutorial to help you get up to speed in the |
| Lecture 2 | Introduction to Python | Some basic tools for working in the language |
| Lecture 3 | Introduction to NumPy | How to use NumPy for computing on data. |
| Lecture 4 | Introduction to pandas | An introduction to using pandas to manage and anal |
| Lecture 5 | Plotting Data | A brief primer. |
| Lecture 6 | Means | Measures of centrality. |
| Lecture 7 | Variance | Measures of dispersion. |
| Lecture 8 | Statistical Moments | Ways to think about distributions. |
| Lecture 9 | Linear Correlation Analysis | A basic primer on correlation and how it relates t |
| Lecture 10 | Instability of Estimates | How estimates can lie and ways to deal with that. |
| Lecture 11 | Random Variables | Theory and sample use cases. |
| Lecture 12 | Linear Regression | An explanation of the technique and implementation in P |
| Lecture 13 | Maximum Likelihood Estimation | A basic intro developed in collaboration wit |
| Lecture 14 | Regression Model Instability | Why your regression coefficients can change. |
| Lecture 15 | Multiple Linear Regression | Expanding from one to many variables. |
| Lecture 16 | Violations of Regression Models | What happens when regression assumptions |

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Page Discussion

Machine Learning for Trading Course

Contents [hide]

- 1 Overview
- 2 Video Content
- 3 Important note
- 4 Instructor Information
- 5 Syllabi and schedule for specific semesters
- 6 Textbooks, Software & Other Resources
- 7 Prerequisites/Co-requisites
- 8 Logistics
- 9 Grading
- 10 Minimum technical requirements
- 11 Office hours
- 12 Plagiarism
- 13 Class Policies

Overview

This course introduces students to the real world challenges of implementing machine learning approaches to trading decisions. We consider statistical appro

This course is composed of three mini-courses:

- Mini-course 1: [Manipulating Financial Data in Python](#)
- Mini-course 2: [Computational Investing](#)
- Mini-course 3: [Machine Learning Algorithms for Trading](#)

A set of course notes and example code can be found here: [\[1\]](#)

Video Content

The video content for this course is available for free at [Udacity](#).

DATA SCIENCE By Thomas Wiecki July 13, 2016

(c) 2016 by Thomas Wiecki. Originally published [here](#).

COMPANY NEWS By Josh Payne January 8, 2015

Since the announcement, the response from the Quantopian community has been phenomenal with thousands of backtests already run using the data. Whole new classes of investment strategy, like quantitative [value investing](#), are now more easily executed in Quantopian.

*This network is running live in your browser

QUANT FINANCE By Kelly Elmstrom July 7, 2016

QuantCon Guest Post by Dr. Ernest Chan

Dr. Ernest Chan, managing member of QTS Capital Management, presented "**Peculiarities of Volatility**" at our annual quant trading conference, [QuantCon](#). You can check out the video of his talk [here](#), and for more detail, read through his [presentation deck](#). Want to replicate the study? We have also created a [cloneable notebook](#) that replicates the volatility study found in the talk, and points to other arbitrage strategies. To view more of Dr. Chan's blog on Quantitative Trading, click [here](#).

FinancialMarkets / 5MinuteFinance

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Interactive Presentations for Financial Education using R/Shiny. See full list of presentations (with links) below.
<https://FinancialMarkets.github.io/5VL...>

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[Tutorial](#)
[R](#)
[Shinyapps](#)

795 commits
1 branch
0 releases
17 contributors

Branch: master
New pull request
Create new file
Upload files
Find file
View or download

Multi-Bridge securitization -- needs to be cleaned
Latest commit d5e74b3 · 7 days ago

| | | |
|-----------------------|--|--------------|
| Commodities | adding to securitization | 2 months ago |
| Corporate_Finance | Merge pull request: #139 from jschellhasepatch-109 | 3 months ago |
| Derivatives | Added new credits language | 4 months ago |
| Econometrics | work on kaiman and snaddle | 3 months ago |
| Equity | linking to work in progress files | 4 months ago |
| Fixed_Income_and_Debt | fixed change in price including convexity equation | 24 days ago |
| Foreign_exchange | Updated credits language | 4 months ago |
| Math_Fundamentals | Rename README.rc.txt to README.txt | 2 years ago |
| Microeconomics | Merge branch master of ssh://github.com/FinancialMarkets/5MinuteFin... | 2 years ago |
| Monetary_Policy | Merge pull request: #148 from jschellhasepatch-115 | 4 months ago |
| Options | small changes to straddle | 1 month ago |
| Portfolio_Finance | securitization -- needs to be cleaned | 17 days ago |
| Risk | Various | 4 months ago |

Medium



Ta Perry
Dec 4, 2016 · 11 min read

Deep Learning the Stock Market

Update 25.1.17—Took me a while but here is an [ipython notebook](#) with a rough implementation



Neural networks for algorithmic trading. Simple time series forecasting



nzw001 / something2vec.md
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[Embed](#)
[<script src="https://ghbtns.com/github-btns.js" type="text/javascript">](#)

something2vec.md

*2vec papers

- word2vec <https://arxiv.org/abs/1310.4546>
- sentence2vec, paragraph2vec, doc2vec <http://arxiv.org/abs/1405.4053>
- tweet2vec <http://arxiv.org/abs/1606.03481>
- tweet2vec <https://arxiv.org/abs/1607.07514>
- author2vec <http://dl.acm.org/citation.cfm?id=2883382>
- item2vec <http://arxiv.org/abs/1603.04259>
- lda2vec <https://arxiv.org/abs/1605.02019>
- illustration2vec <http://dl.acm.org/citation.cfm?id=2820907>
- tag2vec http://ktsurach.weebly.com/uploads/3/1/7/8/31783965/distributed_representations_based_and_personalized_tag_recommendation.pdf
- category2vec http://www.anlp.jp/proceedings/annual_meeting/2015/pdf_dir/C4-3.pdf
- topic2vec <http://arxiv.org/abs/1506.06422>
- image2vec <http://arxiv.org/abs/1507.03616>

deepthoughts / deepthoughts
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[Revisions \(10\)](#)
[Stars \(100\)](#)
[Forks \(31\)](#)
[Embed](#)

deepthoughts

| File | Commit | Time |
|----------------------|--------------------------------|--------------|
| data | nifty data added | 2 years ago |
| to | Date gathering process done | 1 year ago |
| rl_learning | update for supervised learning | 2 years ago |
| supervised | update for supervised learning | 2 years ago |
| tensorflow_inference | TODD added | 1 year ago |
| tensorflow | update tensorflow | 6 months ago |
| _init_.py | init file added | 2 years ago |
| deep_thoughts.md | fix broken markdown headings | 6 months ago |
| process_data.py | nifty data added | 2 years ago |
| models | update for supervised learning | 2 years ago |
| requirements.txt | requirements added | 2 years ago |
| utils.py | update for supervised learning | 2 years ago |

Reinforcement-trading

This project uses Reinforcement learning on stock market and agent tries to learn trading. The goal is to check if the agent can learn to trade. The project is dedicated to here in the great Jesse Livermore and one of the best trader I know Ryan Booth <https://github.com/ryanbooth>

One Point to note, the code inside tensorflow-reinforcement is the latest code and you should be reading/learning if you are interested in project. Learn other directories, I am not working on them for now.

To read my thought journal during ongoing development

https://github.com/deepthoughts/deepthoughts/blob/master/deep_thoughts.md

Before this I have used RL here: <http://www.deepthoughts.com/gist/154759589634/nifty-reinforcement-computation>

If you are looking for more ML in reinforcement learning and stock market, check out the book [Reinforcement Learning for the Stock Market](#)

Machine Learning for Finance and Economics

University of Paris Lodron, Salzburg

Instructor: Amir Sani (amir.sani@univ-salzburg.at)

[LinkedIn](#) [Facebook](#) [Twitter](#)

Course Details

This is an applied course in Machine Learning, intended for students of Economics and Finance. Course contents will be posted before each class.

Programming Language:

The official language of this course is Python 3. We will use Anaconda in class.

You are expected to know how to program in Python before taking this class.

Grading:

Grades will be based on individual quizzes and a team project.

Materials

The following materials are useful for the course:

- The Elements of Statistical Learning: Data Mining, Inference and Prediction, [Python Notebooks](#)
- Applied Predictive Modeling
- Probability Theory Tervise
- Linear Algebra Review

Course Schedule

Class 1: Foundation

- Introduction
- Introduction to the course
- Introduction to the course: How to use the course
- Team Selection
- Review the algorithms in Reinforcement

CS 20SI: Tensorflow for Deep Learning Research

lectures and meeting times are:

depending on the pace of the class.