CSCI 3813/780 Machine Learning In Quantitative Finance
Syllabus – Spring 2015

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Office Hours: F 1:30pm – 2:30pm Otherwise by appointment

Sections   F 9:10am – 12:00pm   SB B141

Prerequisite   CSCI 323 Design and Analysis of Algorithms, MATH 241 Introduction to Probability and Mathematical Statistics, MATH 231/232 Linear Algebra

Textbook   Suggested textbooks and materials:
- Principles of Corporate Finance by Richard Brealey, Stewart Myers, Franklin Allen
- Options, Futures, and Other Derivatives by John C. Hull
- Algorithmic Trading and DMA: An introduction to direct access trading strategies by Barry Johnson
- Analysis of Financial Time Series by Ruey Tsay
- Handouts, including slides and scientific papers

Description   Three hours lecture. Study of the application of machine learning techniques in various quantitative finance problems. Contents include basics of financial instruments, basics of quantitative trading, machine learning and their applications in quantitative finance.

Learning Objectives   The specific learning objectives of this course are:
- To familiarize with the financial environment and understand basic financial instruments such as equities, bonds, futures, options, and other derivatives.
- To understand basics of market and trading, including different types of trade executions, orders, and financial markets.
- To study basic trading algorithms such as TWAP, VWAP, Percent of Volume, Minimal Impact, Implementation Shortfall, Adaptive Shortfall, Market On Close and Pairs trading algorithms as well as portfolio and multi-asset trading.
- To learn machine learning methods such as time series prediction, neural networks, support vector machines, genetic algorithms, reinforcement learning, etc. and their applications to various financial market prediction problems.

Lectures   http://www.piazza.com/qc.cuny.edu/spring2015/csci3813

Grading Policy

Participation	5%
Assignments	45%
Projects	50%

The grading will be on a 100-point scale.
Your participation grade will largely depend on your attentiveness in the class, participation in the class discussion, willingness to ask/answer questions, preparation for class, and your overall attitude. Any student falling asleep

in the class will most likely receive a 0 in the participation grade. Misuse of laptops will also result in poor participation grade.

Class Conduct

Students should conduct themselves in a professional manner.
Laptops will be allowed only for the purpose of the class. If a student uses the laptop for some other purposes and distracts others, then the student's participation grade will certainly be affected.
Students have to turn their cell phones OFF during the class.
No chatting between students except participating in discussions.

Academic Honesty

Students who plagiarize a computer program (or parts of a program), get others to write a program (or parts of a program), or are found cheating, will be reported for academic dishonesty. Anyone who is caught cheating will receive a 0 on a given quiz/exam or assignment. If a second offense occurs, the student will receive an F in the class. This includes both the provider of the information as well as the receiver of the information. Any student who violates the university's academic honesty policy will be reported to the Office of Academic Integrity. For details, look at: http://www.qc.cuny.edu/about/administration/Provost/Policies/Documents/CUNYrevisedacademicintegrityfinal6-8-11.pdf

Add/Drop Policy

http://advising.qc.cuny.edu/generalinfo/acadpol/DisAttenCourse.php

E-mail

Every student will be required to update his/her email address in the CUNYFirst system. All email communications will have to be made using the provided email. It is not uncommon for additional instructions or guidance to be sent by e-mail, so check your mail often. ***Students will be responsible for any instructions sent by e-mail more than 24 hours old.*** The instructor checks mail several times a day (and usually night), so e-mail is often the best way to contact the instructor.