CS 7646: Machine Learning for Trading

Introduction and Overview

Find out how modern electronic markets work, why stock prices change in the ways they do, and how computation can help our understanding of them. Learn to build algorithms and visualizations to inform investing practice.
The Root of All Knowledge

- wiki.quantsoftware.org
Three Parts to the Course

- Part 1: Computational Investing
  - Finance for computer geeks
- Part 2: Machine Learning Intro
  - Computing for finance geeks
- Part 3: Machine Learning + Trading
Part 1
Course Objectives: Computational Investing

- Understand electronic markets.
- Understand market data.
- Write software to visualize.
- Write software to discover.
- Create market simulator.
Part 2

Course Objectives: Machine Learning

- Understand key concepts of ML:
  - Regression versus classification;
  - Parameter learning versus instance-based;
  - How to assess a learner.
- Create KNN-based regression learner.
- Create decision tree-based regression learner.
Part 3
Course Objectives: ML + Trading

- Create an ML-based allocation/trading system.
- Understand how it can go wrong.
Who This is For

- Must be interested in stock markets.
- Student 1: Non-technical person:
  - You are welcome!
  - This course will be hard for you.
- Student 2: Technical person:
  - Strong undergraduate level coding experience assumed.
- How to tell: Take the quiz.
Course Logistics

- Homework: 20%
- 2 quizzes: 10%
- 6 programming projects: 60%
- Final: 10%

- You must do your own work. We will check.
Programming Projects

- Market simulator.
- Fund performance assessment.
- Program that assesses learners (using linreg).
- KNN learner.
- Tree Learner.
- Use learner in market simulation.
About the Instructor

- PhD in Robotics/Machine Learning.
- Professor at Georgia Tech.
- Students: AQR, Citadel, GS, MS
- Hedge fund quant.
- Founder of Lucena Research.
Course Resources

- wiki.quantsoftware.org
- “Active Portfolio Management” by Grinold & Khan
- “All About Hedge Funds” by Jaeger
Next Steps

- Visit course wiki to review course objectives and “getting started.”
- Visit course forum to ask questions you might have about the course.
- wiki.quantsoftware.org
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