FE 567: Financial Data Analysis with Big data

Tue, Thu 16:00 - 17:20

Instructor: Kim, Donggyu

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Prerequisite(s): One semester of graduate-level Statistics
Credit Hours: 1.5

Required textbook: None
Grade Distribution:

Project Proposal	15%
Participation	10%
Final Presentation	40%
Final Report	35%

Course Policies:

- Each team hands in one final report (less than 10 pages).
- **Late proposal or report will not be accepted.**

Final Project Details

- 2-3 students form a team (will be assigned).
- In the project proposal, explain the data type, purpose of data analysis, and methodology. It is fine that the final presentation is different from the original proposal.
- Presentation topic can be any financial big data analysis project. Or present some related paper.
- Slides due 3 days (Tuesday) before the actual presentation.
- The presentation will be rated by all students and the professor. In particular, the rating is based on a questionnaire (20 points by students and 20 points by the professor).

Tentative Course Outline:
The weekly coverage might change as it depends on the progress of the class.

Week	Content
Week 1	• High-dimensional regression • LASSO, Danzig selector
Week 2	• Application to the sparse portfolio allocation
Week 3	• Dimension reduction • Principal component analysis, random projection • High-frequency financial data
Week 4	• Large volatility matrix estimation • Sparse volatility matrix, adaptive thresholding method, relation with False Discovery Rate (FDR)
Week 5	• Approximate factor models for the high-dimension • Dynamic factor models for the high-dimension with applications of VaR • **Project proposal due**: Fri 14:30
Week 6	• Machine learning methods (if time permits) • Recommendation, spectral clustering, etc
Week 7	• Presentation 1
Week 8	• Presentation 2 • **Final report due**: 28th Oct (Monday) 3:00 pm