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Recent advances in mean-variance Portfolio Optimization

Abstract

Over the past decade, the financial technology (FinTech) revolution has transformed financial markets and services through the automation. It refers to specialized methods, algorithms and software that are used on computers and, increasingly, smartphones.

Modern Portfolio theory seems to pervade the Fintech world; in many robo-advisors portfolios are built using mean variance framework. The high dimensionality of the problems has highlighted the need to realize ad-hoc numerical methods, able to deal with ill conditioning, taking benefit from the development of large-scale optimization algorithms.

In this talk we analyse penalty-based mean-variance optimization models for solving multi-period sparse portfolio selection problems. Specialized numerical methods are used to solve nonsmooth models, with both convex or nonconvex regularization terms. Additionally, data-driven approaches for the automatic computation of the regularization parameters are also presented.

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