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Jacopo Fior

Politecnico di Torino

Diversified stock portfolio planning based on time series clustering

ABSTRACT

Planning buy-and-hold strategies for stock trading is a challenging financial task. It entails building a portfolio of stocks maximizing the expected return in the medium- or long-term while minimizing investments' risk. Diversification is the most common strategy to manage risk in financial investments. It entails spreading bets across multiple assets, typically by picking stocks from different financial sectors.

This talk overviews the state of the art of quantitative trading based on machine learning and addresses the long-term portfolio generation task. A recently proposed time series clustering-based approach to improving the effectiveness of stock diversification across sectors is presented. It analyzes the cross-correlation among price series in order to identify groups of stocks belonging to different sectors that unexpectedly show similar trends as well as dissimilarities among stocks of the same sector. The diversification strategy has been integrated into an itemset-based portfolio planning strategy to support long-term investors.

Finally, it will be discussed how big data and machine learning techniques will support expert decisions in portfolio planning and optimization.

BIOGRAPHY

Jacopo Fior is a PhD student at the Department of Control and Computer Engineering of Politecnico di Torino. He obtained his Bachelor's and Master's Degree in Computer Science at UniTO (Università degli Studi di Torino) and collaborated as a research assistant with the University of Helsinki. His current research interests are related to the study and application of Machine Learning and Data Mining techniques to time series data and, more specifically, to financial data.