# 國 立 中 央 大 學

## 統 計 研 究 所

### 學 術 演 講

主 講 人：韓傳祥 副教授（清華大學 計量財務金融學系）

講　　題：**Machine Learning in Finance**

時　　間：**105 年 04 月 26 日（星期二）上午 11：00 ～ 12：00**

地　　點：中央大學鴻經館 **M605** 室

茶　　會：上午 **10：30 ～11：00**　　地　　點：鴻經館 **510** 室


## ABSTRACT

We review methods of machine learning, and apply pattern recognition, artificial neural network, support vector machine, etc to solve for investment problems in the equity market. Despite that technical analysis remains a disputing discipline between financial practice and academics. We demonstrate that machine learning can be applied for technical analysis, which include chart recognition and technical indicators.

Pattern recognition suits for charting. Its primary difficulty is to identify various geometric shapes from historical price charts in a general and automated way. Query by singing/humming (QBSH in short) is an artificial intelligence technique for audio processing. It has been developed successfully for musical information retrieval in the computer science society during last two decades. We present computational algorithms, statistical inference and empirical implementations for chart recognition by QBSH and show strong evidences on the discrepancies of stock return distributions before and after the presence of chart patterns. GPU parallel computing is further used to accelerate the process of chart recognition. A significant speedup can be obtained under the CUDA C environment.

Artificial neural network and support vector machine(or regression) are developed for trading strategies by combing with a generic approach for time series to detect and characterize breaks for additive seasonal and trend. Portfolio performance of these machine generated trading strategies are compared.

Lastly, we show that a possibility that machine can learn from chart patterns to create another new class of trading strategies. All these techniques can be useful for applications in financial technology.


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