



Deliverable D1.2

MSCA-ITN Training for Big Data in Financial Research and Risk Management “BigDataFinance”

Grant Agreement: 675044

This is Deliverable D1.2 of the Work Package 1 (WP1) in “Training for Big Data in Financial Research and Risk Management” (BigDataFinance) Innovative Training Network Marie Skłodowska-Curie project 2015-2019.

Name of the deliverable:

A report and software on a real-time learning method to update decentralized models and address financial market velocity.

Description

The deliverable comprises:

1. **Paper 1** (*under review*). Sergio Garcia-Vega, Xiao-Jun Zeng, and John Keane. “Learning from Data Streams using Kernel Adaptive Filtering”.

[Link: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3306245](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3306245)

This paper proposes a framework for online prediction using adaptive filtering with kernels. The framework is validated on two real-world data sets: (1) internet traffic data from a private internet service provider with centers in eleven European cities; (2) the mid-prices of two major currencies (EUR/USD and GBP/USD) in the foreign exchange market with daily resolution over 12 years.

2. **Paper 2** (*working paper*). Sergio Garcia-Vega, Xiao-Jun Zeng, and John Keane. “Stock Price Prediction using Kernel Adaptive Filtering within a Stock Market Independence Approach”.

[Link: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3306250](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3306250)

This paper proposes an approach to sequentially predict stock prices within a stock market interdependence approach. In this work, stock prices are predicted using not only their local models but also the individual local models learned from other stocks, enhancing prediction performance. The proposed method is tested on 24 different stocks from three major economies.

3. **Software** (*web application*). This web application uses the machine learning methods, proposed in this research project, to predict the prices of financial instruments like forex and stocks.

[Link: https://bigdatafinance.herokuapp.com/](https://bigdatafinance.herokuapp.com/)

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