

## Editorial

# Applications of Machine Learning Methods in Complex Economics and Financial Networks

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The availability of large databases and significant improvements in computational power has been key determinants in the explosive increase of interest in machine learning. In this sense, machine-learning methods, such as neural networks and genetic algorithms, have been used as methodological tools to understand how complex adaptive systems behave and to integrate many streams of unstructured and structured data. Economics and finance, on the flipside, have experienced an increasing interest in micro-level analysis, but the empirical methodologies are restricted to mostly linear methods brought by traditional econometric methods.

This cross-discipline special issue aims at integrating conceptual methodologies of the machine-learning domain with empirical issues that we find in economics and finance. There is a large room for exploration at the intersection of these two areas. Machine learning goes beyond regression methods, and we can use them in a variety of ways. Thus, it can give new insights on how economics and finance data are organized. The application of these methods may contribute to the debate on assessing, monitoring, and forecasting economic and financial variables which is quite relevant.

In this special issue, we welcome new insights, models, and applications in a wide variety of topics that bridge topics in machine learning to complex economics and finance networks. The application and adaptation of re-supervised learning methods, such as data and community clustering, ranking, anomaly detection, and semisupervised

and supervised learning techniques, such as classification and regression, applied to finance and economics, are of great interest.

There are many gaps in the literature, and we address some of them within this special issue. We provide a variety of papers that contribute to the debate on the use of machine learning in economics and finance.

In this special issue, we collect several contributions. We have papers that study consumer loans “Modeling Repayment Behavior of Consumer Loan in Portfolio across Business Cycle: A Triplet Markov Model Approach,” trading strategies “Modeling Investor Behavior Using Machine Learning: Mean-Reversion and Momentum Trading Strategies,” public procurement announcements “Public Procurement Announcements in Spain: Regulations, Data Analysis, and Award Price Estimator Using Machine Learning,” exchange rate forecasts “Chinese Currency Exchange Rates Forecasting with EMD-Based Neural Network,” internalization of RMB “A Study of RMB Internationalization Path Based on Border Area Perspective,” and bankruptcy prediction “A Hybrid Approach Using Oversampling Technique and Cost-Sensitive Learning for Bankruptcy Prediction” and “A Differential Evolution-Oriented Pruning Neural Network Model for Bankruptcy Prediction.”

Few papers also discuss efficiency “Analysis of Financing Efficiency of Chinese Agricultural Listed Companies Based on Machine Learning,” risk evaluation “Application of BP Neural Network Model in Risk Evaluation of Railway

Construction,” stock price prediction “Stock Price Pattern Prediction Based on Complex Network and Machine Learning” and “Is Deep Learning for Image Recognition Applicable to Stock Market Prediction?” pricing models and strategies “Big Data Market Optimization Pricing Model Based on Data Quality” and “Pricing Strategies in Dual-Channel Supply Chain with a Fair Caring Retailer,” demand forecasting “An Improved Demand Forecasting Model Using Deep Learning Approach and Proposed Decision Integration Strategy for Supply Chain,” portfolio optimization “Portfolio Optimization with Asset-Liability Ratio Regulation Constraints,” and measure intimacy “Measure User Intimacy by Mining Maximum Information Transmission Paths.”

Further research could also employ novel methods to exploit prediction of crashes [1], evaluate bank system supervision [2], evaluate dynamic trees for financial data [3], and study efficiency of institutions [4–6].

### Conflicts of Interest

The editors declare that they have no conflicts of interest regarding the publication of this special issue.

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