شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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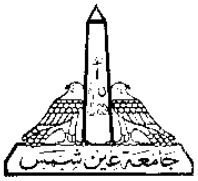

AIN SHAMS UNIVERSITY

FACULTY OF ENGINEERING

Computer Engineering and Systems

Machine Learning Models for Financial Applications

A Thesis submitted in partial fulfillment of the requirements of the degree of

Master of Science In Electrical Engineering

(Computer Engineering and Systems)

by

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Bachelor of Science in Electrical Engineering

(Electronics Engineering and Electrical Communications)

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Statement

This thesis is submitted as a partial fulfillment of Master of ScienceinElectrical Engineering Engineering, Faculty of Engineering, Ain shams University.

The author carried out the work included in this thesis, and no part of it has been submitted for a degree or a qualification at any other scientific entity.

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Abstract

It became obvious the role of machine learning algorithms in different fields which used to analyze data, values prediction, and classification. One of these fields is the finance field so there are different applications of machine learning in finance and one of these applications is the stock market value prediction and classification of its direction.

A stock market is a place where individuals are buying and selling shares of publicly traded companies. A stock is a type of investment that represents an ownership share in a company and investors purchase stocks that they think will go up in value so machine learning algorithms are used to predict and classify the stock market value and its direction by gathering historical datasets.

The purpose of predicting the stock market is to anticipate the price value and direction of stock as higher profits will investors can be made by higher accuracy prediction are gotten and here is one of the most challenging issues is predicting how the stock market will move.

Neural Network has intended to mirror the elements of the human mind and this imitation of brain modeling permits the neural network to learn from experience without requiring human mediation and adjust appropriately to the circumstances.

This thesis is going to predict the value of the close price and the direction of the stock market by applying two proposed models. The first proposed model is artificial neural network architecture and this is used to classify the stock market's direction. The second proposed model is Long-short term memory neural network architecture and this is used to predict the close price value. Finally, the results of performance will be compared with other new published papers that were used the same dataset.

Thesis Summary

The prediction with high accuracy and speed is one of the most important tasks in machine learning to get the trend and results for the given dataset. Machine learning is used in different fields and one of these fields is the finance field so one of the applications of machine learning in finance is predicting stock market value and classifying its direction.

The stock market is a platform where individuals are purchasing and vending shares of publicly traded companies in it with main goal which is making money. The performance of the stock market will have an impact upon economic growth. Thus, the goal is to maximize the profit and minimize the losses so machine learning techniques are used to predict the stock market values and classify its direction with high accuracy by gathering the historical dataset over the last few years.

This thesis contribution is to outperform the accuracy result of stock market prediction value and its direction than other new published studies and papers that will be listed by comparing the accuracy and R-squared results.

The proposed solutions are divided into two solutions by applying a neural network. The first proposed solution is classifying stock market direction into positive and negative indicators by applying artificial neural network architecture. The second proposed solution is predicting stock market value by applying long short-term memory architecture.

Key words: Machine learning, Stock market prediction, Artificial neural network (ANN), Long short term memory (LSTM)

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