

Algorithmic Trading with Machine Learning

Chao (Charlio) Xu

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1 Introduction

algorithmic trading of equities in Python with machine learning and deep learning algorithms to predict market movement directions and equity prices in order to generate extra cumulative returns over the benchmark returns

2 Domain Background

the field of research where the project is derived: automatic trading of equities with predefined algorithms

3 Problem Statement

a problem being investigated for which a solution will be defined: how to predict the market movement directions, and further the equity prices

4 Datasets and Inputs

data or inputs being used for the problem: historic prices of equities from Quandl or Oanda, real-time streaming price data for prediction and testing

5 Solution Statement

a the solution proposed for the problem given: supervised classification learning to predict market movement directions, and supervised regression learning to predict equity prices; further to use neural networks to enhance the learning

6 Benchmark Model

some simple or historical model or result to compare the defined solution to: simple moving average, momentum

7 Evaluation Metrics

functional representations for how the solution can be measured: cumulative returns excluding transaction costs or not

8 Project Design

how the solution will be developed and results obtained: develop in Python; pandas to download financial data; scikit-learn for machine learning algorithms; TensorFlow or Keras for neural networks deep learning