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**Machine Learning in Trading**

**Abstract**

**Garbage**

Some of the methods of Machine Learning that we will look through are:

1. Decision Trees
2. Neural-Networks
3. K-NN Clustering
4. Sentiment Analysis

**1. Introduction**

**Why is information important in trading?**

The importance of information in finance and trading is a known fact. Access or quicker access to information will give you a competitive edge over other firms. However, with the Internet, the speed and ability to obtain information, plays a lesser role in determining the success of traders and firms. (There’s a huge amount of information awaiting on the Internet, within a click away.) The determining factor lies in two questions: 1) How fast and accurately you can process the information? 2) How fast and accurately can you make these decisions?

Traders and firms understands this and already started investing heavily into the rapidly growing field in Computer Science, called Machine Learning (ML). Fundamentally, Machine Learning is a set of algorithms or techniques employed by computers to extract, rules, patterns, and concepts from large amount of data, or information. After learning these rules, patterns, and concepts it can make surprisingly accurate predictions. The only catch, is sufficient data must be provided, which is not a problem with the Internet. Today, 2.5 exabytes of data are produced daily, so there is no shortage in data. Machine Learning is also fast. Once the system has been trained with sufficient data, it can make predictions within nanoseconds, surpassing human’s speed in decision-making.

However, there has yet to be a widespread use of Machine Learning in Trading. This is largely due to the difficulty and complexity of the problem. For most Machine Learning applications, the general idea is to feed the Machine Learning algorithm, or classifier, preprocessed, cleaned, and possibly transformed data. After sufficient data is fed and the classifier finish learning, it can be used for predictions. This approach assumes the data fed is structured

It is not as simple as feeding the information, processing and learning it, and then finally outputting a prediction.

Because of its potential, many fields and companies have begun research. One of these field is Stock Trading. It only makes sense for hedge funds, investors, and traders to invest into Machine Learning, which promises faster and more accurate prediction. However, there has yet to be a widespread use of Machine Learning in Trading. This is largely due to the difficulty of the problem. Despite having a large amount of data, accuracy of studied Machine Learning techniques has not shown great enough results to warrant a switch.

But there is hope. As I’ve mentioned before, Machine Learning is a rapidly growing field and there is heavy investment into Machine Learning techniques for trading. The purpose of this literature review is to summarize, what has been done, what works, what doesn’t, and where we can go further in applying Machine Learning to Trading. In addition, we will review current techniques used in modern day trading and compare its effectiveness with Machine Learning techniques.

**What is the purpose of this paper?**

The purpose of this literature review is to provide a glimpse of ML research in trading. We will answer the two following questions: 1) What doesn’t work? 2) What works? However, the content discussed herein will not go in details on the details of how and why.

**2. The Market**

With respect to information, the market can be analyzed using the Efficient Market

The market can be described using the “Efficient Market Hypothesis” (EMH), which asserts the market is informationally efficient and any traded assets is properly priced in real-time.

The Efficient Market Hypothesis (EMH) makes a very substantial claim regarding the ability to make

**3. Machine Learning Approaches**

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