**ABSTRACT**

**Title:** Time series prediction with recurrent neural networks[[1]](#endnote-1)

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**Keywords:** Machine Learning, Deep Learning, data analytics, recurrent neural networks, time series, bid, ask, spread, LSTM, forex, foreing exchange, trading, brokers.

**DESCRIPTION:**

Time series cover multiple areas, such as communications, health and finance. The RNNs are a subset of neural networks which are based on human neural functioning, because their LSMT units have the ability to remember characteristics over time. Being the LSTM units used for the search of passwords, the learning of physiological models for the behavior of the glucose in the blood and the prediction in the stock market, being this problem the one of work in the investigation. It must be said that the fundamental problem is the rapid variation that the stock market presents, specifically that of the currencies, making it difficult to obtain a good prediction, which generates losses of money.

This research work with data from Quandl and TrueFX implements a fixed window size and additional features to increase the probability of accuracy of the predictive model, being the OHLC and the multisignals significant characteristics, likewise, classical techniques of machine learning were implemented in which the best prediction was given by a GaussianNB model which gave a precision of 26.12% which involves a daily loss based on the strategy of trading raised of 0.00013 USD, equivalent to 3.70 COP, which indicates an improvement over if there was randomness as a trading strategy, this says that the models try to learn things from the signal but not enough to produce favorable results, for this reason, we use neural network architectures, which are more accurate, since by implementing the same proposed trading strategy, they interact more with the market and lose less, around 0.00005566 USD per day, the equivalent to 0.15 COP, which allows us to guess that the grater the complexity of the RNN and the greater the descriptor of the signal, the better results could be produced.

1. Research Work. [↑](#endnote-ref-1)
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